



Conference Theme:
Providing livability at affordability

International Workshop On
livable Cities 2013
(IWLC) 2013

Date:
2nd to 5th October 2013
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INFORMM, Universiti Sains Malaysia, Penang

Editors:
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Assoc. Prof. Dr. Ahmad Sanusi Hassan
Muhammad Nasrul Bin Abu Bakar,
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**Proceeding of International Workshop on Livable Cities (IWLC)
2013**

Providing Livability at Affordability

Universiti Sains Malaysia, Penang
2 – 5 October 2013

Editor:

Professor Dr. Ruslan Rainis
Assoc. Prof. Dr. Ahmad Sanusi Hassan
Muhammad Nasrul Abu Bakar
Jeffiz Ezuer Shafii

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and

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International Workshop on Livable Cities (IWLC) 2013

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MESSAGE FROM THE CONFERENCE CHAIRMAN

"*Selamat Datang!*" which means "Welcome!" to the International Workshop on Livable Cities a joint conference with International Conference on Sustainable Architecture and Urban Design held from 2 to 5th October 2013 in Universiti Sains Malaysia organised by the Centre for Research Initiatives and Sustainable Architecture and Urban Design Research Unit.



The conference addresses the theme "Providing livability at affordability". City development across the globe has attracted rural populations to migrate in urban areas due to job opportunity. The world demography profile shows that 50.5% of the total world populations in 2010 live in the cities. Dramatic increase of the urban population has caused housing shortages and population overcrowding with buying or renting a house at speculative and unaffordable price. With the current global economic and petrol price crisis, the food prices besides have risen sharply which cause affordability level of the inhabitants to live in the city become more acute. The condition typifies living in the city be unaffordable place to live. It is a challenging task to the federal government and local authority with limited financial resources to take initiatives in tackling the problem to provide decent living places for the urban population. The condition has made research studies to improve quality of life at affordable cost become importance. Reaching out solutions and alternatives to the targetted group can be done in a number of ways from various studies in measuring sustainable development and livability in urban areas such as issues in quality of life, comfort, pollution, habitability, socio-economic value, built environment, transportation, education, petrol price hike, place making, energy crisis, crime prevention etc.

We are very pleased by the high quality of papers submitted by the conference presenters from all over the world which will be addressed in the oral presentations. Through these presentations, we hope to share our research interests and development, and to invite participations from researchers at other universities and institutions, and stakeholders interested in architecture and urban design to support our efforts in these contextual issues. The introduction of refereed full papers ensures that a high standard of full papers is preserved for this conference.

I would like to thank to our Advisory Committee, Scientific Committee and Secretariat, especially Mr. Mohammad Nasrul Abu Bakar for generous efforts and supports in making the IWLC2013 a success. I also would like to extend my sincere gratitude for all the cooperation given by the School of Housing, Building and Planning and Centre for Research Initiatives.

Thank you.

Assoc. Prof. Dr. Ahmad Sanusi Hassan

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INTERNATIONAL WORKSHOP ON LIVABLE CITIES 2013 (IWLC 2013)

A joint conference with
International Conference on Sustainable Architecture and Urban Design 2013 (ICSAUD2013)
2nd to 5th October 2013

Venue: INFORMM Building (Conference Hall), Universiti Sains Malaysia, Penang
Conference Theme: Providing livability at affordability

Time	Activities		
1st Day - Wednesday, 2nd October 2013			
8.15 am	Arrival of Participants and Registration		
9.15 am	Welcoming Speech by Assoc. Prof. Dr. Ahmad Sanusi Hassan Chairman of International Workshop On Livable Cities 2013 (IWLC 2013) Head, Sustainable Architecture and Urban Design Research Unit School of Housing, Building and Planning, Universiti Sains Malaysia		
9.30 am	Keynote Address 1 Title: Traditional Arabic Architecture, Functional Capability, Healthy And Sustainability By Prof. Dr. Mohamad Aref Al-Kadri Head, Department of Architecture and Planning, Omdurman Islamic University		
10.15 am	Keynote Address 2 Title: Housing Layout Concepts: A Sustainable Approach In Reducing Crime By Assoc. Prof. Dr. Aldrin Abdullah Dean, School of Housing, Building and Planning, Universiti Sains Malaysia		
11.00 am	Tea Break		
	PAPER PRESENTATION - PARALLEL SESSION 1		
11.30 am	SESSION 1 – ROOM 1 (City)	SESSION 1 – ROOM 2 (City)	SESSION 1 – ROOM 3 (Building)
	Paper 1 Title: <i>Urban Approach For Post Industrial Age, Case Of City Of Bejaia, Algeria</i> by Professor Hamza Zeglache & Nadir Alikhodja, University Ferhat Abbas Setif 1 Algeria	Paper 1 Title: <i>Analysis Of Residential Location Of ICT Sector Employees In A Liveable City – A Case Of Kuala Lumpur, Malaysia</i> by Prof. Dr. Mohammad Abdul Mohit, International Islamic University Malaysia	Paper 1 Title: <i>Generating And Testing The Tropically Adopted Energy Performance Certificate For Residential Buildings</i> by Prof Dr Karl Wagner, Universiti Kuala Lumpur
12.00 pm	Paper 2 Title: <i>Slum Upgrading Without Displacement In The Sub-District Danukusuman Of Surakarta City</i> by Sunarti, Joesron Alie Syahbana & Asnawi	Paper 2 Title: <i>Homestay Programme Practices In Local Community : Towards A Culturally Sustainable Living</i> by Puteri Yuliana Bt. Samsudin, Universiti Sains Malaysia	Paper 2 Title: <i>Impact Flexibility principle on the efficiency of interior design</i> by Oday Q. Abdulqader, University Of Mosul, Iraq

	Manaf, Diponegoro University-Semarang-Indonesia		
12.30 pm	Paper 3 Title: <i>Children Participation In Outdoor Environment In Urban Housing Area</i> by Nor Diyana Binti Mustapa & Dr. Nor Zarifah Binti Maliki, Universiti Sains Malaysia	Paper 3 Title: <i>Architectural And Cultural Background Of The Old City Of IBB – Yemen</i> by Dr. Eman Mohamed Eid Attiah & Ali Ahmed Kassem Drmouh, Ibb University & Menoufia University, Egypt	Paper 3 Title: <i>Mud-Brick High-Rised Buildings Architectural Linkages For Thermal Comfort In Hadhramout Valley, Yemen</i> by Anwar Ahmed Baeissa, University Of Science & Technology, Yemen
1.00 pm	Paper 4 Title: <i>Role Of Street-Level Outdoor Thermal Comfort In Minimizing Urban Heat Island Effect</i> by N. Al-Kurdi & T. Awadallah, The University Of Jordan	Paper 4 Title: <i>Towards Sustainability In The Intelligent Desert City</i> by Dr. Reham M.M. Mohie El-Din & Dr. Walaa Nour, Modern Academy For Engineering And Science, Egypt	Paper 4 Title: <i>A Multiple-Criteria Survey On Satisfactions Of People Living In Prefabricated Concrete Buildings In Thailand</i> by Boonsap Witchayangkoon, Saharat. Buddhawanna, Thiti Koonnarittipol, Tani Chaninsathapat & Chattichai Waisurasingha, Thammasat University, Thailand
1.30 pm	LUNCH	LUNCH	LUNCH
	SESSION 2 – ROOM 1 (City)	SESSION 2 – ROOM 2 (City)	SESSION 2 – ROOM 3 (Building)
2.30 pm	Paper 1 Title: <i>Livable Public Open Space For Citizen's Quality Of Life</i> by Achmad Delianur Nasution, University Of Sumatra Utara	Paper 1 Title: <i>Acceptable And Unacceptable Growth Of Industrial Agglomeration In Urban Environment. Baghdad As Case Study</i> by Hassan J. Hamem, Sadia K. Hasan, University Of Kufa, Najaf, Iraq	Paper 1 Title: <i>Cultural Expression Of Arab Expatriate Communities In Foreign Countries Through Architecture</i> by Professor Eman Mohamed Eid Attiya, Dr. Mohamed Ibrahim Mohamed Ibrahim & Radwa Mohammed Diab, Menoufiya University, Egypt
3.00 pm	Paper 2 Title: <i>Learning Livable Extended Urban Spaces Through Rural Tourism Sustainable Concept, A Case Study Of Yogyakarta, Indonesia</i> by Anna Pudianti, Joesron Alle Syahbana & Atiek Suprapti, Atma Jaya Yogyakarta University	Paper 2 Title: <i>De-Malling: A New Trend For Sustainable Design Of Shopping In The Light Of Livable Communities</i> by Samia E., Al-Menoufiya University	Paper 2 Title: <i>An Approach To Select Window Area In Office Buildings: Modeling And Simulation</i> by Najib Taher Al-Ashwal & Ahmad Sanusi Hassan, Universiti Sains of Malaysia, Malaysia
3.30 pm	Paper 3 Title: <i>The Company Towns' Cultural Heritage As A Subject Of Comparative Analisis: Participation Including People</i> by	Paper 3 Title: <i>Identification Of Elements And Criterions In Therapeutic Garden Design Toward Liveable City</i> by Fuziah Ibrahim &	Paper 3 Title: <i>Adaptation Of Arabic Architecture In Foreign Cultures</i> by Professor Eman Mohamed Eid Attiya, Dr. Mohamed

	Prof. Fabio J. M. De Lima, University Of Juiz De Fora, Brazil	Wan Nor Wahidahsyumaiyah Wan Kamaruddin, Universiti Sains Malaysia	Ibrahim Mohamed Ibrahim & Radwa Mohammed Diab , Menoufiya University, Egypt
4.00 pm	Paper 4 Title: <i>In The Cities : Urban Planning Journey To Protection Of Cultural Heritage</i> by Prof. Fabio J. M. De Lima, University Of Juiz De Fora, Brazil	Paper 4 Title: <i>Liveable Cities Enhance Opportunities. Accessibility Design For All</i> by Wan Mariah Wan Harun & Surayahani Mohd Yusof, Universiti Sains Malaysia	Paper 4 Title: <i>Garden Enhances The Space Environment</i> by Ooi Say Jer & Fuziah Ibrahim, Universiti Sains Malaysia
4.30 pm	Paper 5 Title: <i>Land Use And Sustainable Forest Management In Sabah: Issues And Challenges</i> by Dr. Normah Binti Abdul Lafip & Associate Professor Dr. Nurwati Badarulzaman, Universiti Sains Malaysia	Paper 5 Title: <i>A New Vision Of Misurata City- Libya: An Ecologically Advanced Urban Landscape Design For The City</i> by Aymen Elmagalfta, University Of Hawaii Manoa,Hawaii	

2nd Day - Thursday, 3rd October 2013	
9.00 am	Keynote Address 3 Title: House Facades' Design In Malaysia: Are They Livable? By Assoc. Prof. Dr. Ahmad Sanusi Hassan Head, Architecture Programme, School of Housing, Building and Planning Universiti Sains Malaysia
9.30 am	Keynote Address 4 Title: ITJEMAST journal By Assoc. Prof. Dr. Boonsap Witchayangkoon ITJEMAST Editor, Thammasat University
PAPER PRESENTATION - PARALLEL SESSION 2	
10.00 am	SESSION 3 – ROOM 1 (City)
	Paper 1 Title: <i>Traditional Building Materials In The Architecture Of The Old City Of IBB</i> by Dr. Eman Mohamed Eld Attiah & Ali Ahmed Kassem Dirmoush, Job University & Menoufia University, Egypt
10.30 am	SESSION 3 – ROOM 3 (Building)
	Paper 1 Title: <i>Rainfall And Chemical Weathering Of Basalt Facade At Puebla Cathedral</i> by Margarita Teutli & Elizabeth Leon, Universidad Autonoma De Puebla
11.00 am	Paper 2 Title: <i>Is A Sustainable Urbanism Possible In 21 Century Egypt?A Future Direction For Walkable Settlements</i> by Dr. Hanad Mahmoud Shokry, Jazan University, Kingdom of Saudi Arabia
	Paper 2 Title: <i>Preparedness Plan For Historical Buildings In Ancient Texture Of City Of Tehran In Responding To The Earthquake (Case Study: Historical Texture Of Tehran City)</i> by Solmaz Arzhangji & Mehrnaz Norouzi, Shahid Beheshti University
11.00 am	Tea Break
11.30 am	Paper 3

	Title: <i>Approach For Rural Sustainable Developing Through Using Green Architecture Criteria Case Study Of Menofia Governorate-Egypt</i> by Prof Dr. Eman Eid. & Eng. Ahmed Said Amer, Ibb University & Menoufia University, Egypt	Title: <i>Organization Of The House On Gender Based Batik Craftsmen In Proto Pekalongan</i> by Dr.Ir. Titien Woro Murtini, Msa & Annis Rochma Harani, St. Mt. Diponegoro University
12.00 am	Paper 4 Title: <i>Walkability Assessment Of The Pedestrian Environment In Kuala Lumpur City Centre: A Multi Stage Approach</i> by Zakaria Alcheikh Mahmoud Awad & Sri Nila Inangda & Mastura Adam & Ezlina Adnan, University Of Malaya	Paper 4 Title: <i>The Role Of Design In Perceiving The Auto-Brand By The Visitor Within The Auto-Showroom</i> by Firas Al-Helly & Fuziah Ibrahim, University Sains Malaysia
12.30 pm	Paper 5 Title: <i>Urban Transportation Systems Like Metro Landscape Design And Its Relationship With Form, Function And Aesthetic</i> by Ehsan Nazarzadeh, Islamic Azad University, Tabriz Branch, Tabriz, East Azerbaijan, Iran	Paper 5 Title: <i>Value Engineering Methodology To Improve The Quality Of Buildings For A Livable City</i> by Eng.Rasha Ahmed Riad Ahmad Ibrahim & Prof. Dr Eman Mohamed Eid Attia, El Monoufia University
1.00 pm	Paper 6 Title: <i>The Concept Of Self-Conservation In Kampong Kauman Semarang Of Ethnic Semarang City</i> by Ateek Suprapti Budiarto & Hermin Werdiningsih, Diponegoro University	Paper 6 Title: <i>An Exploration Into The Natural Ventilation in Atria</i> by Tofightabesh & Begum Sertyesilisik, Istanbul Technical University
1.30 pm	Paper 7 Title: <i>Trends Of Terraced House Modification: A Case Study In Taman Sri Cempaka, Melaka Tengah</i> by Nurdaila binti Saji & Fuziah Ibrahim, Universiti Sains Malaysia	Paper 7 Title: <i>An Investigation Into The Thermal Behavior Of Courtyards</i> by Tofightabesh & Begum Sertyesilisik, Istanbul Technical University
2.00 pm		Paper 8 Title: <i>Understanding The Usage Pattern Of Local Facilities In Urban Neighbourhood Towards Creating A Livable City</i> by Wan Nurul Mardiah Wan Mohd Rani, Universiti Teknologi Malaysia
2.30 pm	Closing Remarks by Prof. Dr. Ruslan Rainis Director Centre For Research Liberal Arts & Social Sciences Advisor of International Workshop On Livable Cities 2013 (IWLC 2013)	
	Lunch End of the day	

HOUSE FACADES' DESIGN IN MALAYSIA: ARE THEY LIVABLE?

Ahmad Sanusi Hassan, Yasser Arab and Mohammed Salem Obaid Bakhlah
School of Housing, Building and Planning
Universiti Sains Malaysia

ABSTRACT

The study is to analyse a performance of sunlight penetration on front terraced house facades designed with earliest, modern, post-modern and the current minimalist style for the case studies. Terraced houses are the most popular house type built in garden estates and new towns under garden city's movement in Malaysia to solve the problem of population overcrowdings in the cities. The earliest terraced houses in Malaysia were built in 1950s. By 1980s, modern terraced house style was popularly built till 2000s when it lost its popularity to post-modern architectural style, and lastly after 2010s minimalist style becomes a popular style for the terraced houses. The SunTool software is used in the survey to calculate the amount of shading area and extent of sunlight penetration. The survey will be conducted at a position when the sun path is perpendicular to the house façade. The study finds that the front facade design focuses more on style rather than avoiding sunlight penetration inside the house. Car porch, recessed wall with balcony, sunshade elements and roof overhang are frequently used in the house facade design built after 2000 with post-modern and minimalist style for sun shading purposes compared the terraced houses built before 2000.

Key Words: *Facade; Terraced House; Architectural Style, the extent of sunlight penetration.*

INTRODUCTION

This study is to discuss the extent of sunlight penetration and the amount of shading area on house facades of selected from different house's architecture styles. Terraced house types is selected for the case studies because it is the most popular house type representing more than 43% in 2000 in urban area in this country (*General Report of the Housing Census, 2003*). They are a dominant house type built in garden estates and new towns under garden city's movement in Malaysia to solve the problem of population overcrowdings in the cities. Garden city movement from England are adopted in the city development in Malaysia under 'Decentralised Programme' to withdraw the city population in the existing city to live outside or perimeter of the city. The purposes are to curb development of illegal squatter or slum areas and to provide decent living for the city inhabitants. Under the development, Garden Housing Estates and New Towns are built in urban areas with houses influenced by architectural style in England. Garden City concept is used in the development of the city masterplan because it requires inexpensive construction cost and is economically profitable to the government compared to other development concept.

The information of this study is able to guide the architects on awareness to design the house façade with excellent sun shading design elements. Design faults and without consciousness to the importance of sustainability by the architects are the reasons for poor house façade design which is unable to block

intensity of solar radiation. The benefit of this research is to generate empirical findings and contributions which lead to architectural design recommendations on excellent terraced house facade design as one of the important considerations. In a tropical region like Malaysia, excellent facade design to avoid intensity of solar radiation is necessary (Bakhlah and Hassan, 2012). House facade exposed to direct sunlight causes problem of solar radiation. The sun energy will radiate the heat from outside wall transmitted into the interior of the house (Hassan and Ramli, 2010; Feriadi and Nyuk, 2004). It generates extra heat gains inside the house which causes warm temperature to the indoor area. As a result, this creates uncomfortable thermal condition to the occupants.

THE CASE STUDIES

The case studies consist of a survey on front facade of terraced houses constructed in different durations in Malaysia, 1950s, 1980, 2000s and after 2010s. The good example of the early and modern terraced houses is in Petaling Jaya the first Garden City in Malaysia, the case studies of the modern style were selected in Putrajaya which is the latest new town built in Malaysia and currently becomes an administrative city for the federal government (Hassan, 2005; Hassan, 1999) and finally the selected case studies of the minimalist style were in Shah Alam. The selected terraced houses for this survey are as follows:

1. Earliest Terraced House Style:
 - a. Case Study A: No.2, Jalan 6/30 Street, 46000 PJS6, Petaling Jaya (Figure 1)
 - b. Case Study B: No.9, Lorong 3/57D, 46000 PJS3, Petaling Jaya (Figure 2)
2. Modern Terraced House Style
 - a. Case Study A: No.17, Road SS1/34, 47300 Petaling Jaya, Selangor (Figure 3)
 - b. Case Study B: No.25, Road SS2/43, 47300 Petaling Jaya, Selangor (Figure 4)
3. Post-Modern Terraced House Style
 - a. Case Study A: No. 12, Jalan P9D3 Presint 9, 62250 Putrajaya (Figure 5)
 - b. Case Study B: No. 25, Jalan P16D2 Presint 16, 62150 Putrajaya (Figure 6)
4. The Current Terraced House (Minimalist) Style
 - a. Case Study A: No. 12, Jalan P9D3 Presint 9, 62250 Putrajaya (Figure 7)
 - b. Case Study B: No. 25, Jalan P16D2 Presint 16, 62150 Putrajaya (Figure 8)

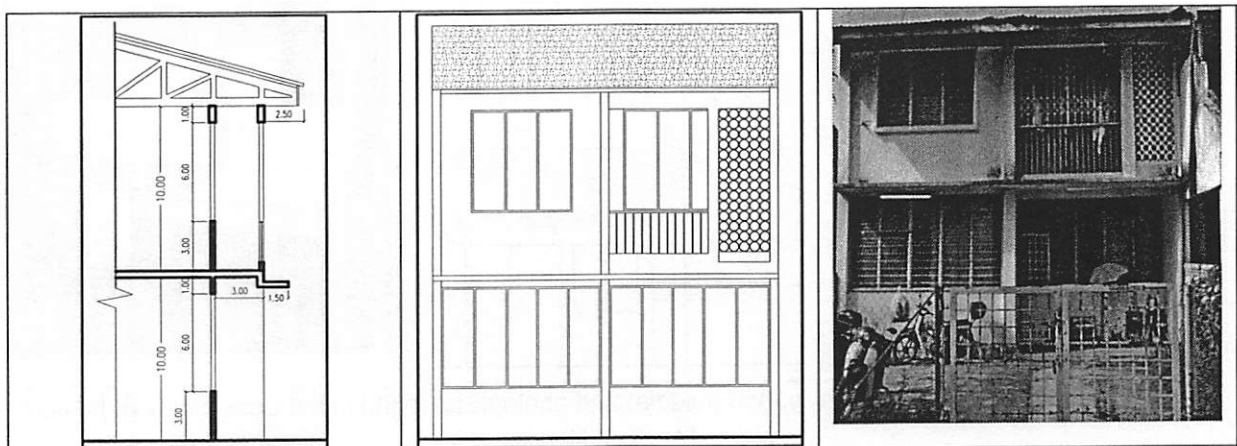


Figure 1. Facade section (left), elevation (middle) and photograph (right) in the Case Study A: Earliest Terraced House

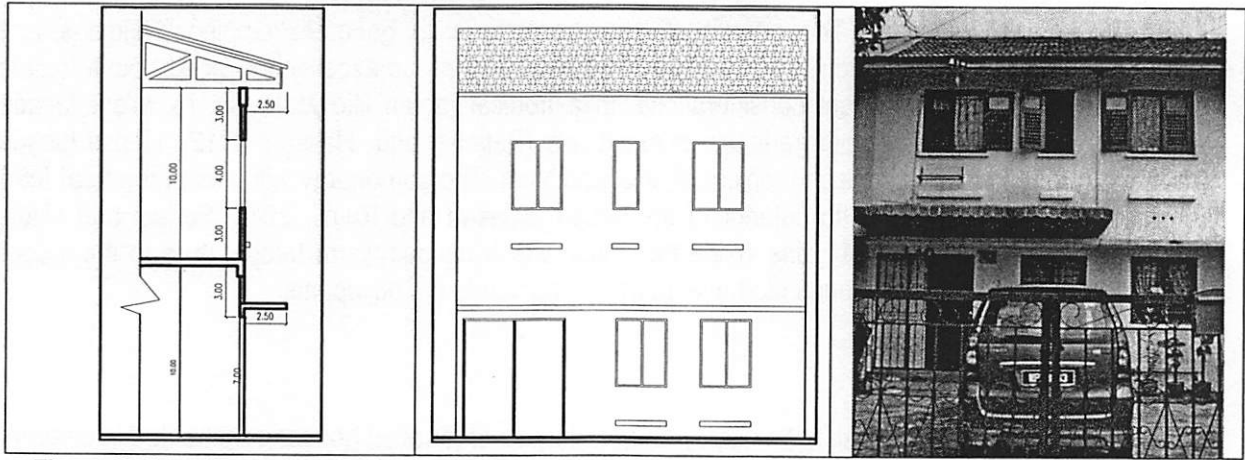


Figure 2. Facade section (left), elevation (middle) and photograph (right) in the Case Study B: Earliest Terraced House

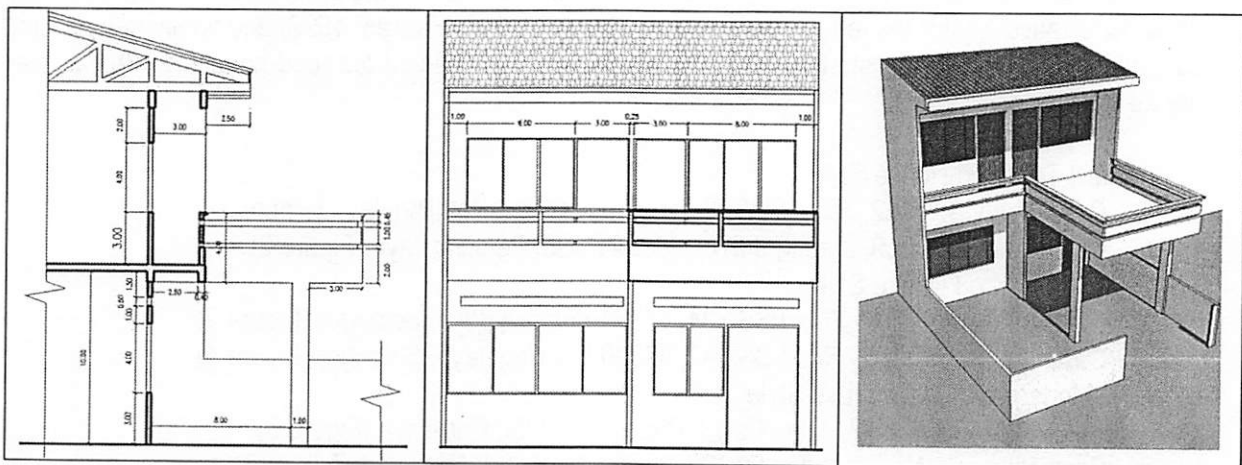


Figure 3. Facade section (left), elevation (middle) and photograph (right) in the Case Study A: Modern Terraced House

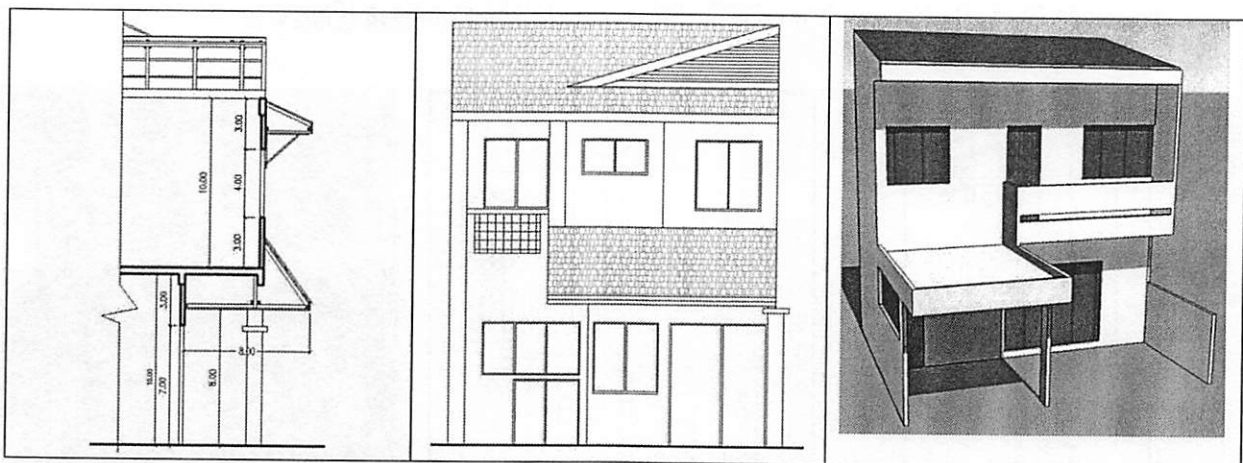


Figure 4. Facade section (left), elevation (middle) and photograph (right) in the Case Study B: Modern Terraced House

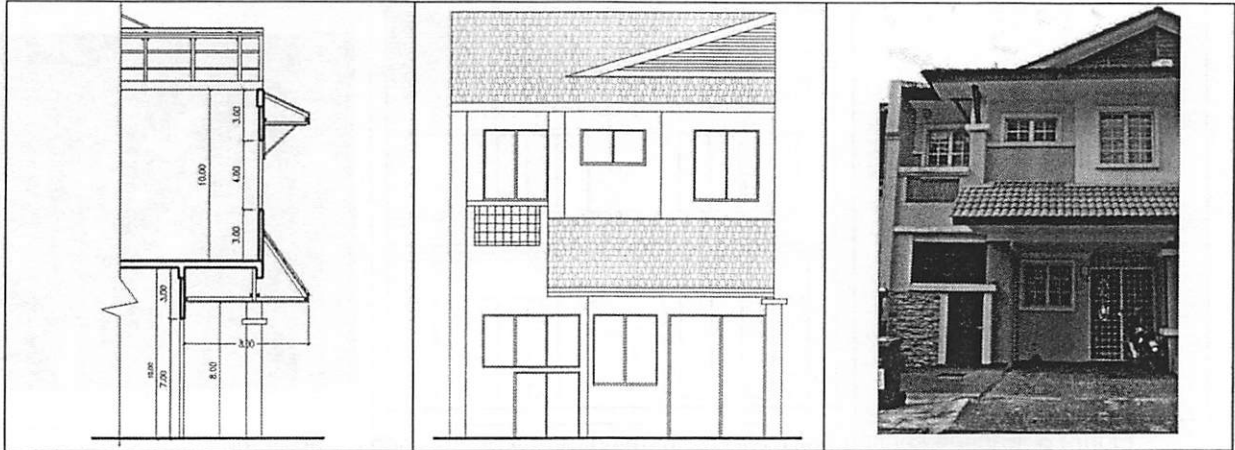


Figure 5. Facade section (left), elevation (middle) and photograph (right) in the Case Study A: Post-Modern Terraced House



Figure 6. Facade section (left), elevation (middle) and photograph (right) in the Case Study B: Post-Modern Terraced House

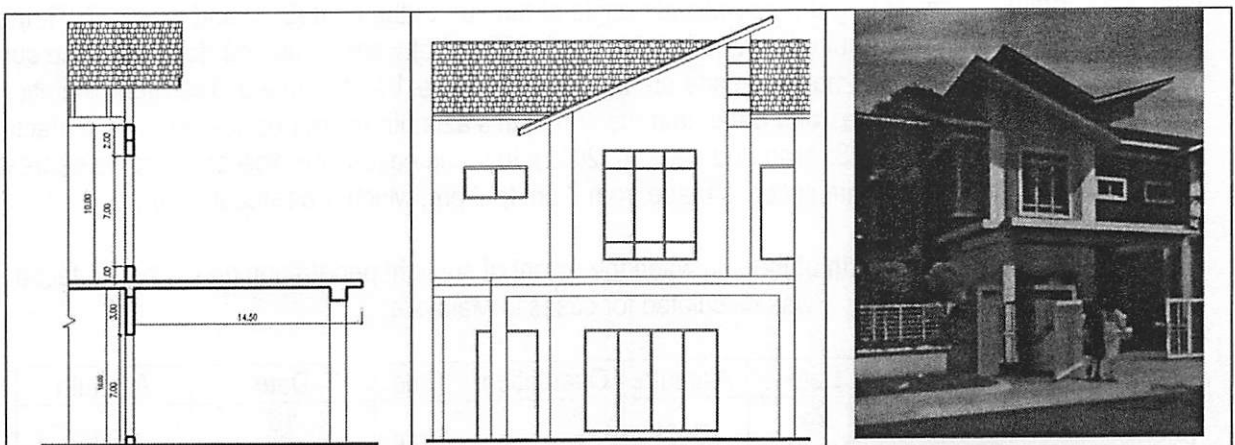


Figure 7. Facade section (left), elevation (middle) and photograph (right) in the Case Study A: Minimalist Terraced House

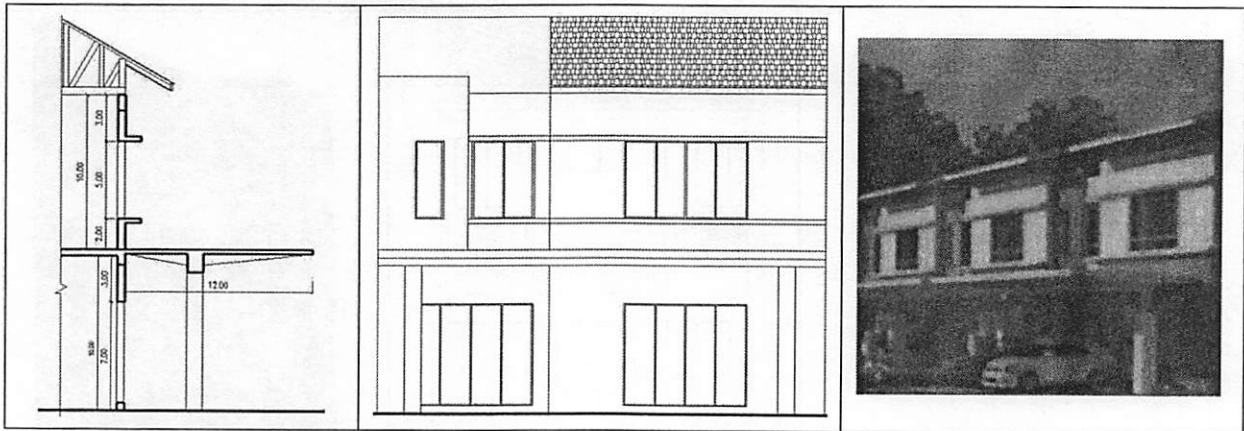


Figure 8. Facade section (left), elevation (middle) and photograph (right) in the Case Study B: Minimalist Terraced House

The design exhibits a range of complex geometric elements blending of modern, colonial and traditional styles with colourful paints on the house facade (Klotz, 1998). It deviates dramatically from regular and simple composition of modern architectural style which emphasises an expression of architectural simplicity and white colour scheme (Curtis, 1996). In case of the houses built at Putrajaya, they represent a showcase for the present and future direction of house designs in Malaysia.

MATERIAL AND METHODS

The SunTool software will be used in the survey to calculate the amount of shading area and extent of sunlight penetration. The survey will be conducted at a position when the sun path is perpendicular to the house facade either during morning (east) or evening (west) session in the case studies. The reason is terrace houses are mass produced house type built at various orientation to the sun path. In this study, the day time at which the sun path perpendicular to the house facade will be used in order to gain the results when the house facade has its maximum exposure to the direct sunlight. By having this method, the survey will be able to identify effectiveness of the facade on shading design (Mazloomi et al., 2010). Limitation of this survey is that the position of the sun path changes overtime. In order to get perpendicular angle of the sun to the east (90°) and west (270°), the data was calculated to the required sun path using the SunTool Software. Time and date when the sun paths are perpendicular to the house facade are illustrated in Table 1 and Figure 9. The other limitation is that there are at certain times and dates that the sun path's azimuth is not possible to have perfectly at 90° (Hassan and Arab, 2013; Arab and Hassan, 2012). In these cases, the closest azimuths nearest to 90° will be used when the simulation is made from 7 am to 6 pm, which are listed in Table 1.

Table 1. Time, date and azimuth of the sun when the extent of sunlight penetration on the house façade was calculated for cases in Malaysia

Orientation	Time	Date	Azimuth	Orientation	Time	Date	Azimuth
East 90°	7 am	23 March	90°	West 270°	1 pm	16 September	90.5°
	8 am	25 March	90°		2 pm	29 March	89.8°
	9 am	27 March	89.8°		3 pm	18 September	89.8°
	10 am	28	90.1°		4 pm	26 March	89.9°

		March				
	11 am	29 March	90°		5 pm	24 March
	12 pm	29 March	92.2°		6 pm	22 March
						89.9°

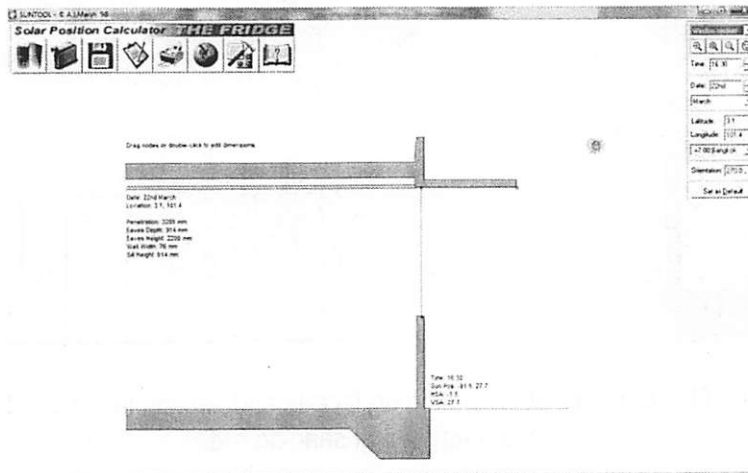
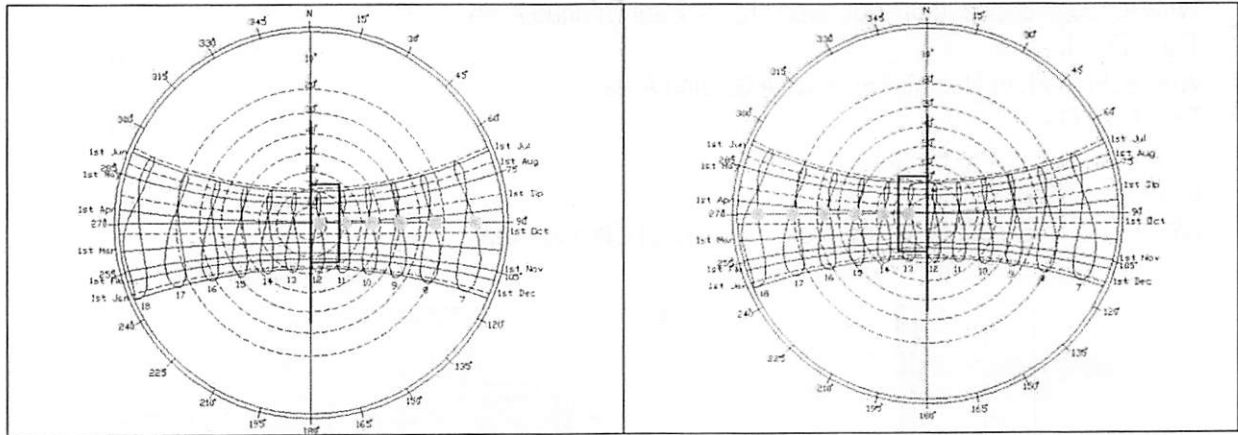


Figure 9. Sun path diagram shows the position of the sun perpendicular to the house facade from 7am to 12pm at orientation of 90° (left) and from 1pm to 6pm at orientation of 270° (right). Source: SunTool Software.

All data such as the location, facade orientation (east or west), time and date will be keyed in the solar position calculator in the SunTool programme (Figure 10) in order to get the correct position before the simulation is made. Later, the dimension of the house facade which are the depth of exterior shading devices, floor height, wall width and sill height are drawn in the SunTool programme. With these solar position and dimension of the house facade, the software will be able to generate in its drawing section to show the sun beam and shade on the house facade which provide the shading area and extension of the sunlight penetration inside the house.

Data Analysis

Building facade was divided in to two main elements namely opaque and glazing elements. The amount of shading area of opaque and glazing elements will be analysed by using the 'SunTool' programme (Figure 11). The amount of shading and exposed area will be calculated based on the

following formula:

$$S_{GA} = S_{GH} \times G_W \quad (1)$$

Where: S_{GA} = Shaded glazing area, S_{GH} = Shading Glazing Height, G_W = Glazing Width

$$S_{OA} = S_H \times L - S_{GA} \quad (2)$$

Where: S_{OA} = Shaded opaque area, S_H = Shading Height, L = Length of facade

$$E_{OA} = T_{OA} - S_{OA} \quad (3)$$

Where: E_{OA} = Exposed opaque area, T_{OA} = Total Opaque Area

$$T_{OA} = F_H \times L - T_{GA} \quad (4)$$

Where: F_H = Floor Height, T_{GA} = Total Glazing Area

$$T_{GA} = G_H \times G_W \quad (5)$$

Where: G_H = Glazing Height

$$E_{GA} = T_{GA} - S_{GA} \quad (6)$$

Where: E_{GA} = Exposed glazing area, T_{GA} = Total Glazing Area

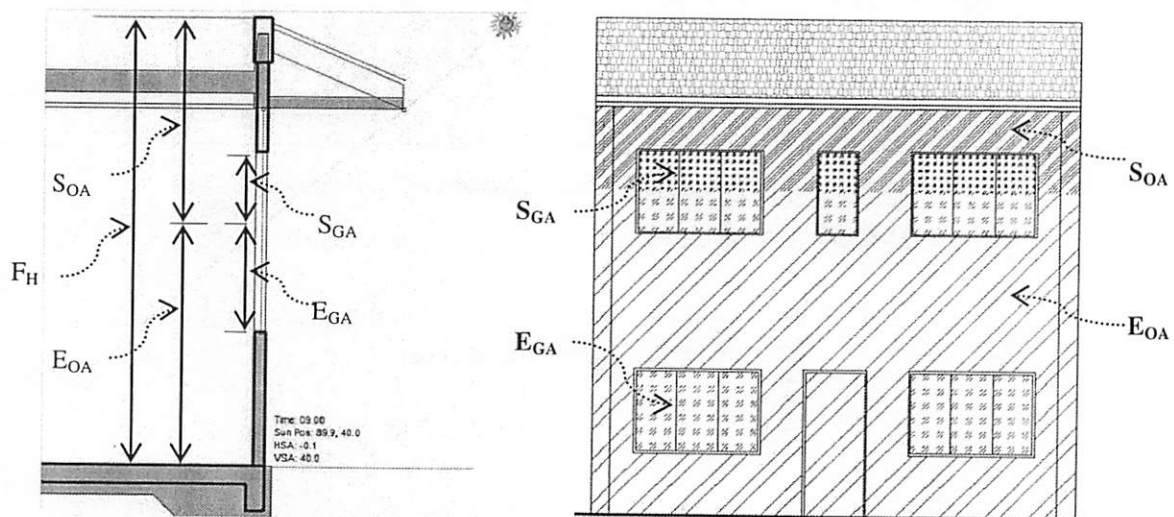


Figure 11. Formulas' abbreviation on facade and section in the calculation of the amount of shading area

Extent of Sunlight Penetration

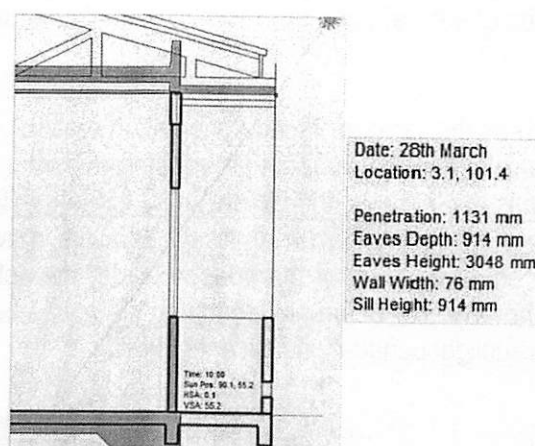


Figure 12. The extent of sunlight penetration given by the SunTool software

The SunTool programme will be also used to measure the extent of sunlight penetration to the

indoor area as illustrated in Figure 12. However, if the overhang shading device is longer than the upper window wall (Figure 13), the second line must be drawn parallel to sun beam of the upper window wall. The second line represents the actual extent of the sunlight penetration. This condition commonly occurs in the early morning (7am to 8am) and late afternoon (5pm to 6pm) due to low sun angle in the sky. The calculation will be as follow:

$$\text{Penetration} = \text{Extent of the Sunlight Penetration calculated by the SunTool software (mm)} - \text{Distance between two lines (mm)}$$

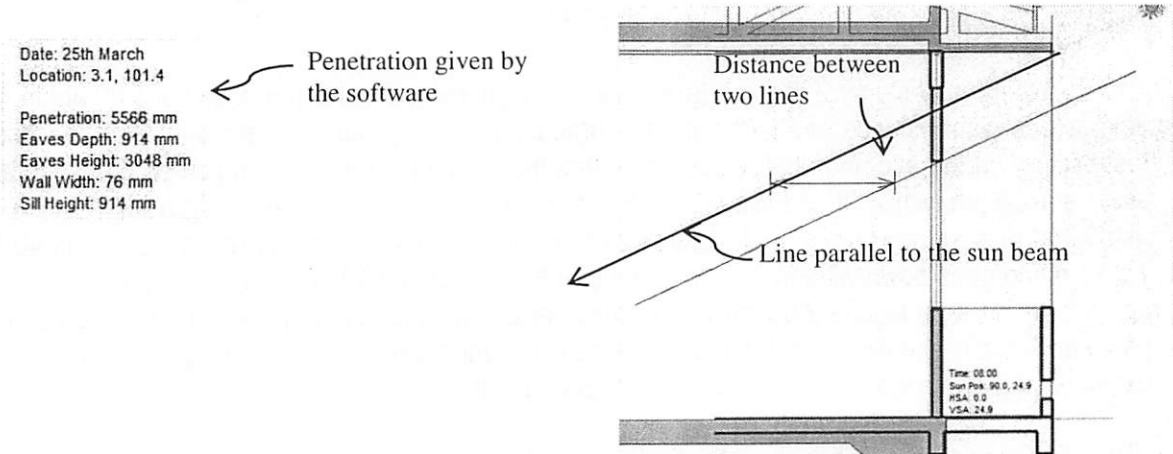


Figure 13. Method of calculation on the extent of sunlight penetration when the overhang shading device blocking the sunlight higher than the upper window wall

RESULTS AND ANALYSIS

The analysis compares results of the extents of sunlight penetration on the ground floor level (Storey 1) and first floor level (Storey 2) of the front house facade for two case studies of each architectural style of terraced house as explained earlier. And then the study compares between the averages of the sunlight extend of all styles.

Table 2. Total facade area (window and opaque wall) for Storey 1 and 2 in the case studies

Cases	Total area (ft ²)	Window (ft ²)	Opaque (ft ²)	Storey 1		Storey 2		
				Window	Opaque	Window	Opaque	
1950	Case A	414	180	234	120	87	60	147
	Case B	383	48	235	24	160	24	175
1980	Case A	388.7	114	274.73	66	142.96	48	131.77
	Case B	437	120	317	78	140	42	177
2000	Case A	400	74	326	34	166	40	160
	Case B	440	124	316	68	152	56	164
2010	Case A	508.6	119.4	389.2	55.9	219.7	63.4	169.6
	Case B	576	173	403	104	184	69	219

(a). Earliest Terraced Houses 1950s

Table 3 and Figures 14 show the sunlight extend penetration for the two selected case studies of the earliest terraced house style. The results show that in the Case Study A sunlight comes through storey 1 of the east façade from 7:00 am with the maximum distance 52ft, then decrease gradually until 11:00 am with only 1.6ft, while in the afternoon the west façade allows the sun to extend inside from 2:00 pm with 2.7ft and increase to reach the maximum distance at 6:00 pm with 96.5ft. On the other hand in the storey 1 of the Case Study B, the results record 40.5ft at 7:00 am from the east façade, to start reducing after that until 10:00 am with 14.9, 8.1 and 4.2ft in order. In the afternoon the simulations show the sunlight starts with 4.2ft at 3:00 pm and then increases regularly to reach the maximum distance at the last hour of the simulation with 75.1ft.

Whereas at storey 2 of Case Study A the sunlight extend inside the house at 7:00 am from the east façade with distance of 51.7ft and start gradual increasing until 1:00am with 18.8, 9.1 and 2.5 respectively, in the afternoon the results show that the sunlight extend penetration on the west façade starts at 2:00 pm with 2.7ft and increase to reach the maximum distance at 7:00 pm with 7, 11.6, 23.8 and 96.5ft respectively. While on the storey 2 of the Case Study B the penetration starts with 40.7ft at 7:00 am and goes down with 14.9, 8.11 and 4.2 at 8:00, 9:00 and 10:00 am respectively, then it starts again from the west façade 2:00 pm with distance of 2ft and increase regularly at 3:00, 4:00 and 5:00 pm with 6.3, 8.8 and 18.9ft in order, the last hour of simulations shows the longest distance for the extent of sunlight in the storey 2 of Case Study B with 75ft.

Table 3. Extents of sunlight penetration in Case Study A and B (Earliest Terraced House style 1950s)

Façade	Time	Sunlight extend penetration (1950s)			
		Case A Storey1	Case A Storey2	Case B Storey1	Case B Storey2
East 90	7:00 AM	52.217	51.755	40.526	40.654
	8:00 AM	18.467	18.759	13.382	14.869
	9:00 AM	9.412	9.127	6.1581	8.1172
	10:00AM	4.793	4.209	2.4704	4.2093
	11:00AM	1.6305	0	0	0
West 270	12:00PM	0	0	0	0
	1:00 PM	0	0	0	0
	2:00 PM	2.693	1.975	0	1.975
	3:00 PM	6.965	6.519	4.232	6.289
	4:00 PM	11.646	11.499	7.988	9.769
	5:00 PM	23.805	24.438	17.641	18.878
	6:00 PM	96.528	96.489	75.076	74.94

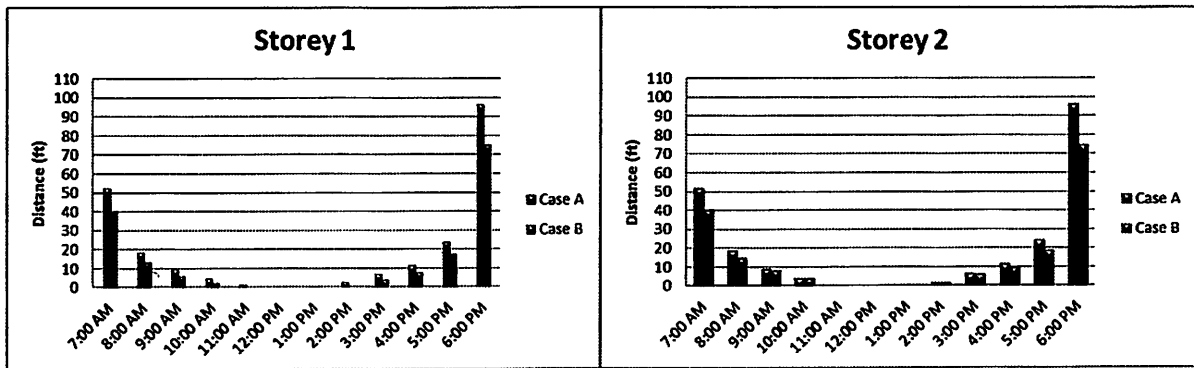


Figure 14. Sunlight Extend Penetration of Case A and B of Earliest Terraced House. Storey 1(left), Storey 2 (right).

(b). Modern Terraced Houses 1980s

The simulation's result of Modern Terraced Houses style's case studies are shown in Table 4 and Figure 15. The outcomes show that both Case Study A and B have similar behavior in terms of the sunlight penetration in almost all simulation hours from 7:00 am to 6:00 pm. Both of the case studies in the ground floor start with high records of the sunlight penetration with 47.8ft for Case Study A and 40.1ft for Case Study, the next three hours show similar results for both of them with about 15, 8 and 3ft at 8:00, 9:00 and 10:00 am respectively. Between 1:00 am and 1:00 pm no sunlight into the house in both of case A and B, at 2:00 pm case A keep the result with 0ft while case B shows 1ft. At 3:00 and 4:00 pm the sunlight penetration from the west façade of both cases A and B with about 5.4 and 9.8ft in order. The last two hours of the simulations the records are 21.9 and 89.4ft at case A and 18.9 and 75.4ft at case B. The first floor (storey 2) for both case studies have similar results at most of the simulation hours, the sunlight extend starts in Case A at 7:00 am with 42.4ft the decrease at 8:00 and 9:00 am with 14.8 and 5.7ft respectively. In the afternoon the sunlight continue to extend from the west façade at 4:00 and 5:00 pm with 7.9 and 20.3ft respectively, then the last hour of simulation shows 80.1ft. In the other hand the first floor in Case B shows an extent of the sunlight from the east façade in the morning hours as follows, 40.5, 14.8, 8.6 and 3.7ft from 7:00 to 10:00 am. The sunlight penetrates from the west façade in the evening hours with 1.5, 6, 10.9,18.9 and 74.9ft at 2:00, 3:00, 4:00, 5:00 and 6:00 pm respectively.

Table 4. Sunlight penetration of Case Study A and B with Modern Terraced House style (1980s)

Façade	Time	Sunlight extend penetration (1980s)			
		Case A Storey1	Case A Storey2	Case B Storey1	Case B Storey2
East 90	7:00 AM	47.8	42.7	40.052	40.465
	8:00 AM	14.8	14.78	14.875	14.881
	9:00 AM	7.7	5.67	7.913	8.576
	10:00AM	3.2	0	3.293	3.71
	11:00AM	0	0	0	0
West 270	12:00PM	0	0	0	0
	1:00 PM	0	0	0	0
	2:00 PM	0	0	1.167	1.476
	3:00 PM	5.3	0	5.465	6.02

	4:00 PM	9.9	7.94	9.79	10.878
	5:00 PM	21.9	20.33	18.877	18.861
	6:00 PM	89.37	80.07	75.37	74.852

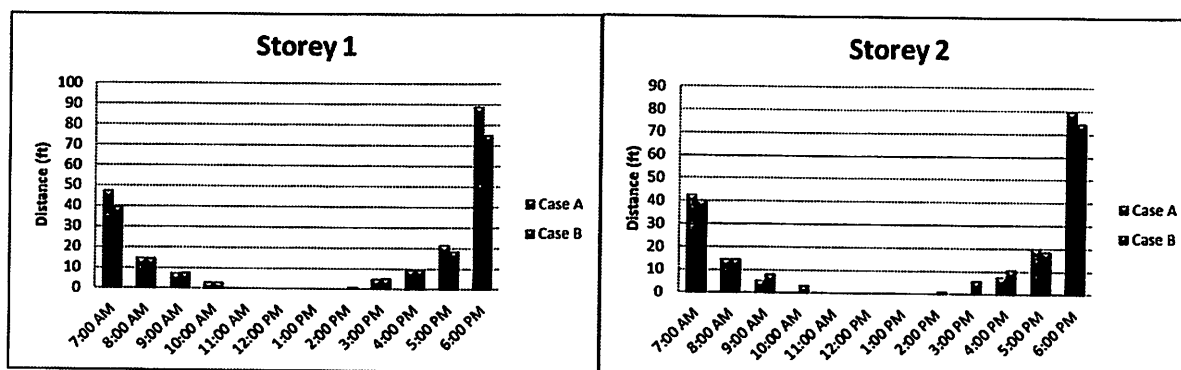


Figure 15. Sunlight Extend Penetration of Case A and B of Modern Terraced House with Storey 1(left), Storey 2 (right).

(c). Post-Modern Terraced Houses 2000s

The sunlight extends penetration for the post-modern terraced houses style are shown in the Table 5 and figure (16), the results of simulation show that the ground floor (Storey 1) of both Case Study A and B allow the sunlight to get into the house at the first and last two hours of the simulations, Case Study A starts in the morning with 38.3 and 9ft at 7:00 and 8:00 am, and then no sunlight extend from the east nor the west façade until 5:00 and 6:00 pm with 13.7 and 75.1ft in order. Case Study B shows the same pattern with 33.6, 5, 9.5 and 73.6ft at 7:00, 8:00 am, 5:00 and 6:00 pm respectively. On the other hand the sunlight starts to extend at Storey 2 of Case Study A from the east façade at 7:00 to 10:00 am with 40.1, 14, 6.3 and 2.3ft respectively, then in the afternoon from 3:00 to 6:00 pm with 4.2, 9.6, 18.7and 75.2ft. While Storey 2 of Case Study B starts from 7:00 until 11:00 am with 46.3, 17.1, 9.3, 5.1 and 1.1ft respectively; and in the afternoon hours from 2:00 to 6:00 pm with 3.1, 7.3, 12.6, 24.3 and the maximum distance 85.6ft respectively.

Table 5. Sunlight penetration in the Case Study A and B with Post Modern Terraced House style (2000s)

Façade	Time	Sunlight extend penetration (2000s)			
		Case A Storey1	Case A Storey2	Case B Storey1	Case B Storey2
East 90	7:00 AM	38.24	40.09	33.63	46.28
	8:00 AM	9.03	14.04	5.03	17.1
	9:00 AM	0	6.29	0	9.33
	10:00AM	0	2.31	0	5.09
	11:00AM	0	0	0	1.09
West 270	12:00PM	0	0	0	0
	1:00 PM	0	0	0	0
	2:00 PM	0	0	0	3.09
	3:00 PM	0	4.2	0	7.25

	4:00 PM	0	9.57	0	12.61
	5:00 PM	13.5	18.65	9.49	24.32
	6:00 PM	75.13	75.16	73.56	85.61

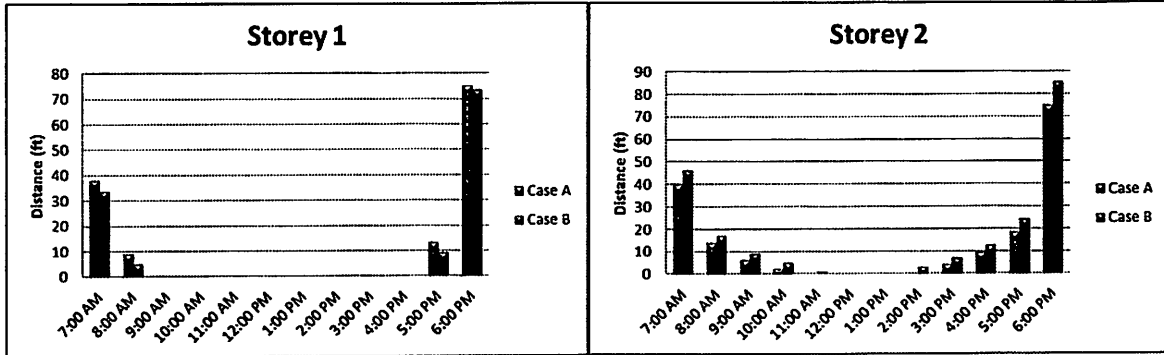


Figure 16. Sunlight Penetration in the Case Study A and B of Post-Modern Terraced Houses with Storey 1(left), Storey 2 (right)

(d). Minimalist Terraced Houses (2010s)

The results in Table 6 and Figure 17 show the sunlight penetration of the east and west façade of two case studies from the current terraced house’s style (Minimalist), at the ground floor of both case studies, the design prevents the sunlight from extending inside the house at most of the day hours, the results of storey 1, the Case Study A shows the extents of sunlight at 7:00, 8:00 am, 5:00 and 6:00 pm as follows: 39.9, 5.9, 10.8 and 82.6ft respectively, while the same hours at the Case Study B records 40.4, 5.8, 11.2 and 73.6ft respectively. Whereas first floor (storey 2) of the Case Study A the sunlight penetrates inside the house from the east and west façades during most of the simulation hours, the sunlight penetration starts from the first hour of the simulation in the morning at 7:00 am with 46.3ft then declines to 16.7, 8, 4.5 and 1.2ft at 8:00, 9:00, 10:00 and 11:00 am respectively, after that from the west façade the sunlight extends with 3.6ft at 2:00 pm and rises at 3:00, 4:00 and 5:00 pm to reach the maximum distance at 6:00 pm with 6.8, 10.8, 21, 84.1ft respectively. While for the Case Study B, the sunlight starts extending from the east façade at 7:00 am with 40.1ft and decreases at the following three hours with 13.7, 6.1 and 3ft. From 11:00 am until 1:00 pm no sunlight extends penetration were recorded from neither east nor west façades, at 2:00 pm the sunlight starts to penetrate inside the house from the west façade with 1.9ft and increases to reach the maximum extent at 6:00 pm with 5.1, 8.6, 17.7 to 73.1ft.

Table 6. Sunlight penetration of the Case Study A and B with Minimalist Terraced House style (2010s)

Façade	Time	Sunlight extend penetration (2010s)			
		Case A Storey1	Case A Storey2	Case B Storey1	Case B Storey2
East.90	7:00 AM	39.85	46.33	40.36	40.12
	8:00 AM	5.89	16.73	5.81	13.73
	9:00 AM	0	8	0	6.14
	10:00AM	0	4.47	0	3.03
	11:00AM	0	1.17	0	0

West 270	12:00PM	0	0	0	0
	1:00 PM	0	0	0	0
	2:00 PM	0	3.59	0	1.92
	3:00 PM	0	6.8	0	5.05
	4:00 PM	0	10.8	0	8.63
	5:00 PM	10.83	21.04	11.24	17.69
	6:00 PM	82.61	84.05	73.6	73.08

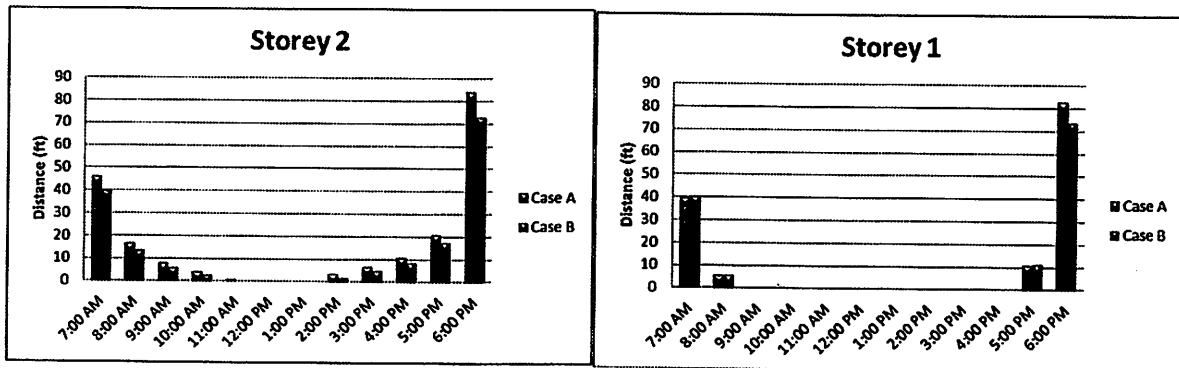


Figure 17. Sunlight Penetration of the Case Study A and B of Minimalist Terraced House Style with Storey 1(left), Storey 2 (right)

CONCLUSION

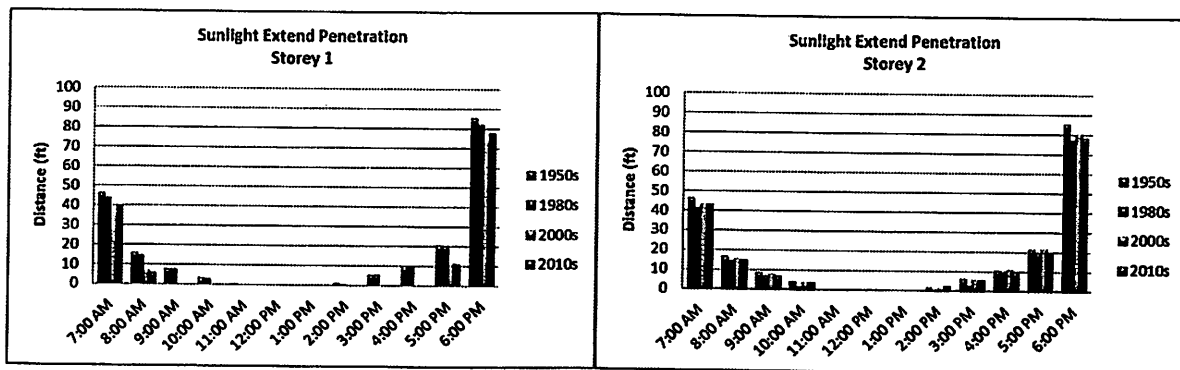


Figure 18. Sunlight Penetration of the Case Study A and B of all terraced house styles with Storey 1(left), Storey 2 (right)

The study finds that the extents of sunlight penetration reach the maximum distance inside the house in the early morning and late afternoon in all the case studies from the different styles, and that is because of the low angle of the sun position in the sky during these times (Landry and Breton, 2009). The results in the Tables 3 to 6 and Figure 18 show that the Earliest Terraced House Style has the deepest extents of sunlight penetration at all hours of simulation, followed by the Modern Terraced House Style. Design with efficient sun shading devices is frequently integrated not until after 2000s with car porch, recessed wall with balcony, louvered windows and roof overhang in the Post-Modern and Minimalist Terraced House Styles. These sun shading elements were very effective preventing sunlight penetration inside the house, design for better liveability. The design however mostly effective on storey 1 and that make these two styles more liveable, efficient and preferable by both architect and people at the present time. For storey 2, the simulation results shows that all terraced house styles

have not been shaded with a car porch that this condition causes Storey 2 has deeper sunlight penetration than Storey 1 in most cases in all the case studies.

ACKNOWLEDGMENT

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REFERENCES

- General Report of the Housing Census. (2003). Putrajaya, Malaysia: Department of Statistics Malaysia Press.
- Bakhlah, M.S. and Hassan, A.S. (2012). The study of air temperature when the sun path direction to Ka'abah: with a case study of Al-Malik Khalid Mosque, Malaysia. International Transaction Journal of Engineering, Management & Applied Sciences & Technologies. Vol. 3 (2), pp. 185-202.
- Hassan A.S. and Ramli, M. (2010). Natural ventilation of indoor air temperature: A case study of the Traditional Malay House in Penang. American Journal of Engineering and Applied Sciences. Vol. 3 (3), pp. 521-528.
- Feriadi, H. and Nyuk, H.W. (2004). Thermal comfort for naturally ventilated apartments in Indonesia. Energy and Building. Vol. 36, pp. 614-626.
- Hassan, A.S. (2005). Konsep Rekabentuk Bandar di Semenanjung Malaysia: Kuala Lumpur dan Bandar-Bandar di Sekitarnya. Penang: Universiti Sains Malaysia Press.
- Hassan, A.S. (1999). Putra Jaya: The Direction of Malaysian New Town, Proceedings of the 5th International Congress of Asian Planning Schools Association (APSA). Seoul National University, Seoul, South Korea, pp. 165-175.
- Klotz, H. (1996). History of Post-Modern Architecture. Cambridge: MIT Press.
- Curtis, W.J.R. (1996). Modern Architecture since 1900. (3rd ed.). London: Phaidon Press.
- Mazloomi, M. et al. (2010). Influence of geometry and orientation on flank insolation of streets in an arid climate city. American Journal of Engineering and Applied Sciences. Vol. 3 (3), pp. 540-544.
- Hassan A.S. and Arab, Y. (2013). The essence of design with light: Single pedentive dome mosque in Turkey and Bosnia Herzegovina during winter solstice. From Anatolia to Bosnia: Perspectives on Pedentive Dome Mosque Architecture. A.S. Hassan and S. Omer (Eds.). Penang: Universiti Sains Malaysia Press.
- Arab Y. and Hassan, A.S. (2012). Daylighting analysis of pedentive dome's mosque design during summer solstice with case studies in Istanbul, Turkey. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. Vol. 3 (2), pp. 167-183.
- Landry M. and Breton, P. (2009). Daylight simulation in Autodesk 3ds Max Design 2009 Advanced Concepts. Colorado: Autodesk Inc.

URBAN APPROACH FOR POST INDUSTRIAL CITIES, CASE OF THE CITY PORT OF BEJAIA, ALGERIA

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ABSTRACT

The issues of new livability are intimately linked to the future of cities, because the majority of the world human population will be in urban area by 2050. The goal of this paper is to seek solutions to face the challenge of the current issues of development, economy, housing, etc. First is a synergy of development of the city, this is a necessary thing for more prosperous and well matching with natural environment and for more livability. This synergy stimulates the livability and sustainability. At this time it's based on the culture that is itself based on knowledge society as a whole. The cultural resilience and livability is essential for the sustainability of cities and related to the cultural dimension. Knowing that, is a complex issue, we have explored some definitions of culture, indeed. There are also different interpretations of culture. Cultural heritage is mainly a material expression of people's culture and it requires conservation and knowledge in the prospect of future urban planning projects.

Key Words: city port, economic and urban space, natural and historical heritage, sustainable development .

INTRODUCTION

Port cities are a particular point in an area, instead of import export, location of industry and services, attractive space, space tourism and trade. They are open cities on various cultures[A], Bejaia is an Algerian town with Berber culture, North African and Mediterranean cultural influence, and it's no coincidence that many port cities in the world are a crossroads of cultural exchange: Barcelona, Amsterdam, Copenhagen, Istanbul, Alexandria, Tokyo... These cities have the capacity of self transformation in order to maintain their identities. Generally, port cities are places of cross-cultural exchanges. These port cities have an industrial base such metallurgy, trading, shops. The city of Bejaia has a postindustrial image by having oil refining and processing industry generating a large pollution.

The origin of the conflict and the loss of urban dynamics

Today Bejaia, has two aspect images, its port and city, are structurally in conflict, the waterfront has given way to dilapidated industrial fabrics and polluted. Various activities coexist in the same space with incompatibilities such as the location of industrial activities within the residential of the city center. The case of the port of Bejaia, is a good object study, indeed the city Bejaia has lost the ground on both fronts whatsoever heritage preservation or the natural waterfront site. The lack of urban studies related to the well being of the population gives the sense of letting go and abundant. It comes through the poverty of the architecture produced and the Westernization concept of a modern city center. To most policy makers, practicing architects, urbanists and so forth, the city conjures up images of the modern urban center, based on industry and factories. On occasion it could be an administrative or political center, but this is not crucial to the image of the "modern" city they have. It is certainly a commercial center, a fact related to its industrial base. Further, it is a center for the arts and entertainment. Along

with these features go the problem aspects of the city, such as slums, overcrowding, smog, and crime and so on. It is this kind of city, which might be called the post industrial city. That has attracted exclusive attention in urban studies.

It is the kind of city that classical locus of the great urbanist theories of modern sociology such as those of Robert E.Park, Louis Wirth, Pitril A .Sorokin and George Simmel. Although the city dealt with in this urban theory, its prototype is found in industrial Europe; with roots going back to pre-industrial time. Its expression in the no- European world occurred as the result of the expansion of Europe in the age of discovery and the industrial revolution. For example, city port and commercial centers did exist in many parts of the ancient world, but they have not been part of the empirical materials on which modern urban theory rests. There is nothing inherently wrong with the study of certain kind of city, peculiar to a specific time and place, but a problem arises when that kind of city is understood as the only kind of city conceivable.

These are the factors of disintegration of society and the plunge into a multidimensional crisis. The result is a cultural and identity conflict, which in turn implies, among other consequences, a city disjointed set of independent entities each other and thus a lack of organicity. In the historical retrospective, Bejaia has experienced several periods: Phoenician, Roman and Muslim Ottoman, the city was open on its territory and the sea with a small fishing and trade port, wearing Saracen (Porte de sarrazine still standing to testify this).

During the period of French occupation with the completion of the port, the harbor front and rear port, the arrival of the railway, began a phase of cutting and encrypting the meaning of the door and the city, by the sea installation of some industrial units on the outskirts of the city behind the line of railroad. The creation of an oil port in the front port, also involved the installation of storage area for oil on the outskirts of the city. This has accelerated the development of port and industrial activity, which gave the French to choose their zoning policy, the installation of a large industrial area in the central part of the plain.

This Colonial penetration transformed Bejaia, socially, spatially, and ethnically into separate discrete units-- the indigenous city and the European quarter. In particular, this separation was due to the introduction of colonial urban regulations. The spatial transformation was presented as an urbanism which generated urban. The Projects based on the idea of 'extending' the city and making it 'beautiful' in treating colonial urbanism as a philosophy representing the values of dominating political power stated, The overall shape of the town suggests how this philosophy was spatially projected. As some indigenous comment, the overall street plan takes the form of a cross rammed into the old part of Bejaia making the colonial imagery even more suggestive.

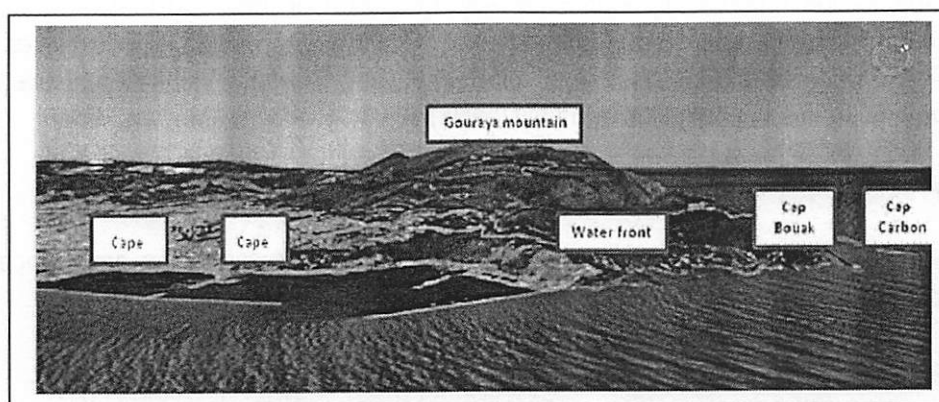


Fig 1: Site of Bejaia

This colonial urbanization is accompanied by a projection of the European image of modernity in the city, with banks and governments fully and profoundly changing the traditional pattern and the secular city of Bejaia. A second phase was initiated in the mid-fifties. The proposed plan was for

political reasons. It proposed to solve the housing problem of indigenous through the projection of buildings at moderate rent indigenous neighborhoods whether intra-or extra-mural. This plan had resulted in a typological rupture in these neighborhoods. In parallel, the growth of the city is along the farm path, and leaves the territorial golf against continuous peak especially after the implementation of storage barrels. The growth of the city is along the farm path, and leaves the land route of continuous peak especially after the implementation of storage barrels of oil products along the coastline. The settlement will bring with its new design of the city, built a new European type as an external influence and different from traditional model of the region. Thus colonization brings through its installation, a break, whether on the construction typological or morphological, and in social side and identity.

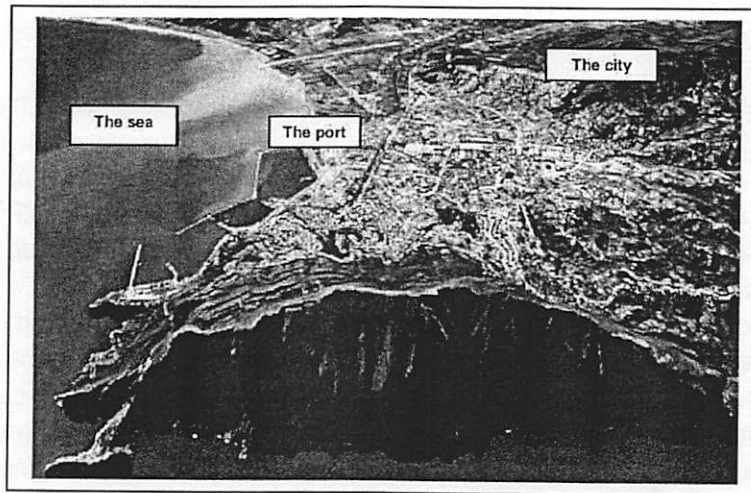


Fig 2 : the city of Bejaia and Mediterranean sea

The city of Bejaia happens to be the result of a superposition of several frames of different developmental periods that correspond to historical stages. The current state of the city shows a linear extension along the axis by simply adding structures one beside the other. This addition has lost the highlights of the city are important, they are reduced to mere crossroads. Since independence in 1962, priority was given to the industry to improve the economic status; it explains the importance of the industrial base of the area compared to the ancient city. We took the principles of the modern urban movement that encourages the break with the notion of the island and the means of social communication to know the street instead. Along with this, there has been available to the concept hierarchy, that of the urban entity and especially the notion of threshold that provides a sense of belonging and can therefore appropriate space. The street and the place lost their values in the areas of habitat are reduced to single lanes and simple empty a large formal and functional poverty.

- Out of scale (between the old and new towns).
- Out of the city / sea merge.
- Loss of the plot with the appearance of large sets that cause the emergence of residual spaces.
- Out of integration site (no link between the building and its site).
- Out of social integration.

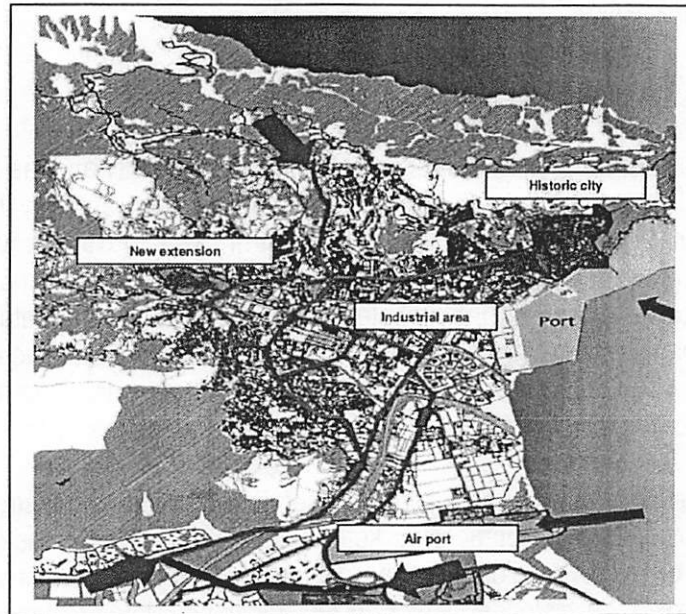


Fig 3: Evolution of the city of Bejaia

Port areas have always had roles and strategic locations, historically network nodes that linked the distant lands and people. In recent decades, their function is often changed because of the relevance of changes in the maritime and port sectors caused by changing technology - such as the relocation of projects related to new production techniques and materials, the prevalence of packaging-shipping (containers, dry port, well finished ...). These changes and the process of relocation of activities that often characterizes the port area are also reflected in the lowering of the cultural relationship between the local community and the sea recovery and improving relations between communities, the city, port and coastal areas can make possible innovative strategies for rehabilitation and enhancement of local identity, shaping a new identity linked to the sea, in this case the Mediterranean.

Development perspective and new role and new features in port areas

Current methodological approaches and many experiments show that the renewal of coastal and port areas are able to start the regeneration process, if it is based on a strong relationship with the urban context, the improvement of its local characteristics and vocations . Port areas are often enriched with new project of modern architecture but also to reuse their built heritage. This strategy can provide the opportunity to integrate new tourist, cultural, recreational, linked to functional diversity and economic activities. The implementation of this integrated approach is particularly appropriate in areas of great environmental, cultural and historical characteristics. In these areas, new development strategies, new activities and uses in buildings and open spaces to ensure the safeguarding of resources, identity and vocation of the territory.

Port areas have become a field of interest for new redevelopment and regeneration process. The evolution of ships, shipping and port facilities provided heritage areas and buildings, especially warehouses; available for new functions, because redevelopment projects often involve industrial wasteland or degraded gradually weakened their role in the urban context, the result of a profound transformation. In many cases, the renovation of the coastal cities of large, medium and small dimensions are determined by the need to redefine their business models, in order to point to tourist and cultural offer. For many metropolitan areas of the sea, the process of recovery and reclamation of old ports also depend on the needs of urban rehabilitation. Therefore, the starting point for the establishment of a functional and territorial continuity between the city and the sea, to promote the organization of a new rehabilitation project of the Port of Bejaia must be based on the systemic Reuse

buildings not used for scientific, commercial and cultural purposes.

New strategy reuse and planning "step by step":

The idea to solve the contradiction of the relationship between the city and the sea through actions that could repair the fault generated over time between urban and port and, on the basis of the analysis described could return to traditional uses and enjoyment of areas of citizens who are now assigned to activities totally unrelated to urban dynamics [B]. If the main objective of the project is to repair the suture between the city and the sea, the first step on the conceptual plan that is absolutely essential is the removal and diversion of heavy traffic dedicated to oil. It is natural that such an operation cannot be justified on the basis of a functional reorganization of the port, which leads to a separation of areas for activities not very compatible with each other and release zones more closely related to the consolidated city.

The particular shape of the port of Bejaia and set in a coastal area strongly consolidated and characterized throughout its development as key points of interest - the historical center of the city. Based on scenarios of future development, the city can be in direct contact with the sea, and areas outside the dock, next to the historical center, in the traditions related to those of the harbor and the sea. Operation of this kind inevitably raises two fundamental questions: what procedures will follow to gather the different needs and policy makers for a single purpose? What are the design strategies will be adopted to restore the most authentic part of the identity of a city worse?

The complexity of decision-making suggest that the answer to the first question can be found in "the planning stage", which defines the various deadlines that actions to consider progressively more difficult and clear, but in within a unified and consistent design. Planning the next steps is to identify small and large stocks, step by step, to create the attraction, improvement of urban space, returning it to its rightful owners - the citizens - and giving rise to mechanisms autonomous generation of cultural diversity and interest, therefore, the economic interest which, in turn, will give a boost to the revitalization, in a continuous cycle.

The answer to the second question, however, is condensed into a few words of De Solà Morales to design the Moll de la Barcelona [C]: *"Some people think that space is modern because it contains modern objects. But it is a big mistake. Revitalizing is not doing a news space through modernization, but to make a new instantly recognizable as part of the existing city space. Create a modern space means creating a mix of urban functions not known before."*

If this is the case, it seems natural to think that the first way to revive the lost areas of the city, is that recovery and never as in the case study, this solution is the most appropriate: the port of Bejaia is in fact a hidden treasure terms of abandoned buildings, some of undeniable historical and architectural value, as Abdelkader Fortress, Sarrazine door, etc. and the other, less obvious, such as various buildings, mixed among the many stores and warehouses in ruins Revitalize can therefore mean the return value to public space and the return of the space for citizens through the recovery latent wealth, no need to reinvent the form of places, but simply filled with the contents of the existing social and cultural containers rooted in history and places to reconnect to a new network of relationships, spaces and functions.

In practice, therefore, the strategy is divided into three stages: in the meantime, the focus is on the functional reorganization and recovery and reuse of buildings, reinvent destinations to create multi-functionality and integration with the city in an intermediate horizon, these urban objects will be included in a system of paths and relationships, which can be formed only by a network of shelters and walkways that meander through the building and result in different spaces and times, long term, with the hope of greater attractiveness of the region and the consequent generation of interests and resources, it is possible to define a more complex architectural object, a landmark that will catalyze the flow of interest and to become a new element of the identity of the urban space.

Proposal for future models of cultural and historical cohesion:

Thinking in this direction, it's necessary to emphasize that the general environment is composed of a multitude of places which in turn offer them self as a collective memory and identity "containers" values regardless of characteristics specific physical. James Hillmann [D] says that all over the world has a symbolic event: Wherever man has left traces of its existence, it is a soul which takes the place exclusive and unrepeatable identity.

Creative activities could be effective tools to create a development that takes into account the soft values instead. Creative activities are activities based on social, cultural, trade and used distinguishing factors of the place and reinterpreted in a creative way. We can say that they (creative activities) transform and create a "use of intangibles elements" They can materialize in events, demonstrations, exhibitions that generate added value. We can say that creative activities can increase the value of the place.

The challenge to understand, how to use the intangible value, cultural and symbolic values of places, becomes civic values of the community. The aim is to involve the people and incite to come. On the physical level, the most obvious conflict is the morphological and functional heterogeneity of space, due to the lack of an overall vision of integration between infrastructure and the city. Neglecting the local identity is to make space out the action of the integration project.

Current methodological approaches and many experiments show that the renewal of coastal areas and port can start the regeneration process, if it is based on a strong relationship with the urban context, the improvement of its local characteristics and vocations. Port areas are often enriched with new project of modern architecture but also to reuse their built heritage consists of port warehouses and disused shipbuilding unit. This strategy can provide the opportunity to integrate new tourist, cultural, recreational, increasing regional competitiveness and attractiveness and employment rates, linked to functional diversity and economic activities. The implementation of this integrated approach is particularly appropriate in areas of great environmental, cultural and historical characteristics as the case of Bejaia. In these areas, new development strategies, new activities and uses in buildings and open spaces to ensure the safeguarding of resources, identity and vocation of the territory.

The port areas have become a field of interest for new redevelopment and regeneration process [E]. The evolution of ships, shipping and port facilities provided heritage areas and buildings, especially warehouses, available for new functions, because redevelopment projects often involve industrial wasteland or degraded gradually weakened their role in the urban context, following deep.

CONCLUSION

In many cases, the renovation of the coastal cities are determined by the need to redefine their business models in order to point to tourist and cultural offer in a global vision of post industrial age [F]. For many cities on the sea, the process of recovery and reclamation of old ports also depend on the needs of urban rehabilitation in international competition. This strategy aims both to attract investment for new production facilities (traditional territorial marketing) and the conquest of events, fairs, exhibitions, sporting and cultural events. The renovation of the seafront, led to the emergence of a common trend of openness, both formal and functional, the port of the city and the territory, difficult to detect early.

REFERENCES

- [A] Marshall, R. (ed.) (2001), Waterfronts in Post Industrial Cities, Spon, London
- [B] Meyer, H. (1999), City and Port: Urban Planning as a Cultural Venture in London, Barcelona, New York, and Rotterdam: Changing Relations between Public Urban Space and Large-scale Infrastructure, International Books, Utrecht.

- [C] De Solà Morales (2008), Deu lliçons sobre Barcelona. Ten Lessons on Barcelona, COAC, Barcelona
- [D] Hillmann J. (2004) - L'anima dei luoghi" the spirit of the place", Rizzoli.
- [E] Kacemi Malika,(2006), Protection du littoral en Algérie entre politiques et pouvoirs locaux : Le cas du pôle industriel d'Arzew (Oran- Algérie), Vertogo, Revue électronique en science de l'environnement Online, Volume 7 Numéro 3 | décembre 2006 from <http://vertigo.revues.org/>
- [F] MINISTÈRE DE L'AMÉNAGEMENT DU TERRITOIRE ET DE L'ENVIRONNEMENT (2006), RÉPUBLIQUE ALGÉRIENNE DÉMOCRATIQUE ET POPULAIRE, PROGRAMME D'AMÉNAGEMENT CÔTIER (PAC), "ZONE CÔTIÈRE ALGÉROISE" FINAL RAPPORT, ONLINE FROM <HTTP://WWW.PAP-THECOASTCENTRE.ORG/PDFS/RAPPORT%20FINAL%20INTEGRE%20WEB.PDF>

SLUM UPGRADING WITHOUT DISPLACEMENT AT DANUKUSUMAN SUB-DISTRICT SURAKARTA CITY

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ABSTRACT

The displacement of dwellers has often been included in slum upgrading schemes; creating problems even more complex than the ones they were trying to solve (UNESCAP, 2008). This has led to the thinking of slum upgrading without displacement; an effort of which has been rather successfully carried out in Danukusuman Sub-district in Surakarta City Indonesia. This study examined and described the form of upgradings which have been carried out using qualitative methods. Data collected through interview, field observation and document review is analyzed using qualitative descriptive technique.

Analysis showed that the upgrading process was carried out through bottom-up planning, involving the local community throughout the process starting from finding the problems, planning the program, up into construction and through the maintenance process. The process also included the legal certification of land ownership of the local inhabitant; giving them a better legal standing whenever disputes arise. The upgrading included physical improvements of houses and infrastructures such as roads which resulted in accessibility by cars. By not displacing the local slum inhabitant, it was found that the people felt more comfortable and safe about the upgrading. With the upgrading it was possible for them to improve their economy.

Key Words: slum upgrading, without displacement

INTRODUCTION

Usually slum upgradings are carried out through top-down approach (Das, 2009). Such approach according to UNESCAP (2008) has been used because governments wanted to improve the conditions of the slums to meet certain standards and norms (Payne, 2005). Top-down approach has a weakness in that it may fail to absorb values and aspirations coming from the slum inhabitants. Upgradings are often carried out to merely serve government interests or to profit the private sectors; the local communities are often viewed as the source of problems (UNESCAP, 2008).

One of the main causes of displacement (or eviction) is the strong role of capital interest in the planning of cities (Uitermark, 2013; UNESCAP, 2008). Lands which previously had been planned for settlements may have been developed into commercial uses; not serving the social interest of the communities (UNESCAP, 2008). The displacement often caused new and more complex problems leading to large-scale urban poverty. The new poor would then increase in numbers and had to live in non livable places (Boonyabanha, 2009; UNESCAP, 2008). In top-down planning the local communities could not speak for their interest and express their aspirations to stay in their lands.

All this have led to the thinking of bottom-up approach in slum upgradings; a process based on the aspirations of the local community, rarely does it involve displacement of the inhabitants. The Surakarta City administration has successfully carried out such upgrading process and gained an award from the central and provincial governments on slum management. The upgrading was legalized

through Mayor Regulation Number 13 Year 2007 titled "Pedoman Pelaksanaan Pemberian Bantuan Pembangunan/Perbaikan Rumah Tak Layak Huni Bagi Masyarakat Miskin Kota Surakarta" a form of a manual for slum upgrading for the area. The administration did not displace the inhabitants which already have legal ownership of the land and is in compliance to the city plan; this is an effort to respect the rights of the people as stated in the Agrarian Law Number 5 Year 1960.

The success has led to the awarding of the BSP2S program from the ministry of housing (Kemenpera) in 2008 and 2009 (BSP2S: Bantuan Stimulan Pembangunan Perumahan Swadaya - a form of stimulus package for home improvements). The ministry also provided grants for home and infrastructure improvements in 2010 through the BSP2S and PKP program for 200 houses. The location was set in Danukusuman Sub-District by the city government, namely in RW IX and RW X for several reasons: (1) it has the worst condition of houses, (2) many of the lands are legally owned, and (3) the location is in compliance to the city plan, and (4) the houses are built in close proximity therefore increasing efficiency of the infrastructures being built or repaired. This study examined and described the form of upgradings which have been carried out in Danukusuman Sub-district in Surakarta City Indonesia.

LITERATURE REVIEW

Aspects in Slum Upgrading without Displacement

Displacement, according to UNESCAP (2008), is the moving, be it temporary or permanent, which is involuntary and against the will of the individuals, families, or communities, from the place that they have inhabited, without provision or access to any form of protection. Displacement is not desired by the displaced, because it causes despair and poverty (Uitermark, 2013). It was often carried out without agreements from the community of the company of legal order from the government. It was also considered to be against the international law because it breaches the rights of the citizens.

This has led to the emergence of slum upgrading without displacement, especially in locations which are in compliance to the city plan. The process while including improvements of the physical, social and economic environment of the area, may be the most inexpensive and humane choice in the provision of low-income housing direly needed by urban areas. Commonly the community focused on the technicalities such as road, drainage, clean water, sanitation, and waste system improvements in the upgrading program; however, other aspects such as the house, land, income, public facilities and access to public services should also be considered (UN Habitat, 2003; Davis, 2006; UNESCAP, 2008; Karanja, 2010).

The first aspect is the house, as the physical structure the families dwell in. The second aspect is land in terms of its long term ownership, which in turn will guarantee their existence. The third aspect is income, which includes the ability to access better jobs and income or create small businesses. The fourth aspect is public facilities, which includes improvements of spaces used together by the community such as playgrounds and markets. The sixth aspect is access to public service which included improving access roads to public facilities. The seventh aspect is welfare which is the establishment of a communal welfare system, managed by the people and may help the poorest members of their community (Usavagovitwong, 2006; UNESCAP, 2008).

There are many reasons for the approach; not only that it promotes participation in the following processes, letting people stay where they are keeps them together and consolidated, maintains the social stability and builds a support mechanism (Uitermark, 2013). The first step included planning and implementation of the project, it continues with the communal management of the social and economic activities in the community. This will stimulate the population to invest in the rehabilitation of their homes and the neighborhood. The improvements of the houses and living environment will also improve the quality of life of the population while removing the threat of eviction. Setting legal ownership of the land also means building assets and improves value of the land. Having owned the land and the house, the population may use it as collateral for loans, be rented or sold in times of needs

(Davis, 2006; Boonyabantha, 2009).

In the process of upgrading, the rearrangement of space for infrastructure, schools, playgrounds, health clinics or places of worships is possible, this builds the community's morale and pride. Upgrading also allows the population to use their houses to develop more income through creating small shops, renting rooms or building workshops. Lastly, having a legal address also means an easier access for jobs in the formal sector which would guarantee better payment (Davis, 2006; UNESCAP, 2008).

Drawbacks of Common Slum Upgradings

The imposition of the top-down approach has been the main weakness of the common slum upgradings; it has led to the failure of replication to increase the scale, scope and effectiveness of the strategy (Cities Alliance 1999; World Bank 2001 in Das 2009). The increasing number of slums may have been caused by, among others, lack of standards in the buildings, high price of land, regulatory hassles, and incompetencies.

In community based programs, regulatory blunders, institutional disconnection, and lack of political will have hindered the potential to increase standards (Nitti and Dahiya 2004 in Das, 2009). Imperato and Ruster (2003, in Das, 2009) suggested that such program will only be meaningful when covering at least 10% of the urban poor. They also considered political sustainability as an important aspect in raising the standards besides strategies involving cost recovery. City-wide upgrading policies must be supported by locally and nationally conducive regulatory framework, strategic cooperation with private sector and individuals, and transparent development of institutional management (Das, 2009).

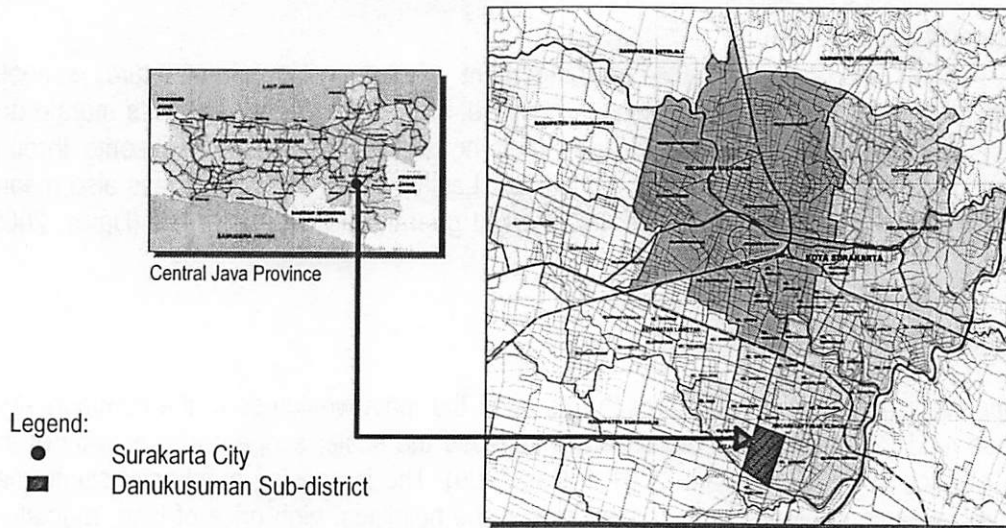
METHOD

This study employed case study method which according to Denzin (2005) explores best learning practices through examination of the case being studied. The exploration may include the core problem of the case, the relationship to its scientific environment and context, the embedded theories it may contain, and the correlation of issues in the case, and ultimately what may be learned from the experience to better humanity. Groat and Wang (2002) explained that case study may combine explanatory, descriptive and exploratory methods in a research,

Data collection was completed through interviews, field observations and document reviews. Interviews were carried out with key persons such as local officials, public figures and members of the community. Observations were completed to capture the change in the physical form of the settlement based on photos and construction drawings. Planning document regarding the upgrading of the slum was reviewed. Qualitative descriptive analysis was carried out by describing data extracted from document reviews, interviews, and field observations and explorations.

SUB-DISTRICT DANUKUSUMAN

Danukusuman sub-district is located 1,5 km south of Surakarta city center, with 5,08 Ha area. It is located in a flat area and mostly used as settlements along with other uses such as commercial and governmental. Administratively it is divided into 15 RWs (Rukun Warga - community) and 58 RTs (Rukun Tetangga - neighborhood). This study area consisted RW IX and RW X which are mostly inhabited by poor people living in slums. The study area is shown below:



Map 1:
Surakarta City and the Study Area

One of the advantages of the area is being located in a strategic location on the main Solo-Wonogiri road, with high land value due to commercial uses around the area. RW IX has 3 RTs while RW X has 4 RTs, totaling at 1.423 people in 422 households. The details are shown below:

Table 1: Population and Households in the Study Area

RW/RT	Population (people)			Number of households
	Male	Female	Total	
RW IX :				
RT 01	104	125	229	53
RT 02	123	107	230	74
RT 03	121	112	233	73
Sub-total	348	344	692	200
RW X :				
RT 01	83	87	170	45
RT 02	86	91	177	56
RT 03	89	106	195	63
RT 04	94	95	189	58
Sub-total	352	379	731	222
Total	700	723	1,423	422

Source: Monografi of Danukusuman Sub-district, 2013

Most of the inhabitants are native locals living by generations, only a small number are immigrants. Most of those immigrants are males taking local females as their wife. Most of the inhabitants have low education level (only finishing elementary school) work as merchants, force labors, and industrial or construction workers.

There are 256 houses in the study area; however only 200 houses categorized as not-livable received aid as much as 5 million Rupiahs per house unit from Kemenpera, the aid for infrastructure improvement amounted at 4 million Rupiahs per unit. The total of aid was 1,8 billion Rupiahs, this amount was added with money owned by the people in order to improve their own houses. The following table shows the data on the condition of the house in the study area.

Table 2: Housing Condition in the Study Area

RW/RT	House (units)		
	Livable	Not-livable	Total
RW IX :			
RT 01	9	19	28
RT 02	6	31	37
RT 03	10	26	36
Sub-total	25	76	101
RW X :			
RT 01	20	25	45
RT 02	4	29	33
RT 03	6	35	41
RT 04	1	35	36
Sub-total	31	124	155
Total	56	200	256

Source: KSM Danukusuman 2010, analysis, 2013

Before the rejuvenation process, the lands in Danukusuman Sub-district were owned either by the Keraton or the people. In 1997 the lands were starting to be acquired by private owners, in 2007 all of the lands are stated as privately owned (HM). Legal ownership of the land had been related to increased welfare, reduced poverty, improved housing and infrastructure, reserved social stability and better economy (Payne, 2005; Boonyabanha,2009), this drove Surakarta government to rejuvenate the area without displacing the people.

The area often suffered from floodings due to lack or absence of good drainage. It also suffered from disordered arrangement of housing plots, deteriorating infrastructure such as unaccommodating roads, lack of access to clean water, low sanitation, and waste management. These were compounded with health and nutritional problems, along with low income and high crime rate.

Stages in the Upgrading

Slum upgrading in Danukusuman Sub-district has been carried out since 2010, conforming to Kemenpera's budget year. It was preceded by data collection by Surakarta City government of people who are poor and living in legally-owned houses categorized as 'not livable', as specified by Kemenpera. The survey found 200 houses which met the criteria but 2 houses were not approved as it was considered as 'livable'. However, the community voted the two houses as 'not livable' and therefore eligible for the program. The decision was approved by the government.

The first step was socialization to the community. The government contacted several political figures because the area was highly influential in the area (Das, 2009). The program ran smoothly as the figure already possessed close relationships with the government as grant provider. Socialization was carried out in 4 stages; 1st about the data collection, 2nd about slum upgrading, 3rd about the construction and 4th about the implementation mechanism.

Right after the first socialization and the community agreed on the beneficiaries, a team was established known as KSM (Kelompok Swadaya Masyarakat). It coordinated the upgrading in small groups therefore absorbing all aspiration from the community. The group consisted of 25 people representing every household. There were 8 KSMs representing 200 low-income households in the area. The next step was planning with the assistance from the government; plans were prepared by the government based on the data collected in the year prior to the program. A planning document containing designs for infrastructures and housing prototypes was made. Upon completion of the

planning document, the next step is socialization of the program to the communities.

The next step is the construction, done by the people accompanied by PNPM and contractor as quality controller. Construction processes were carried out according to the plans and prototypes agreed therefore the people already knew how the improvements should be made. The improvements included changing roof panels, wall repairs, floorworks, painting, and also windows and doors repairs. Community infrastructure improvements included provision of clean water, along with drainage, sanitation, and waste, and open space improvements.

Slum Upgrading Without Displacement

The upgrading process which took place at Danukusuman Sub-district had been in the form of building quality and neighborhood infrastructure improvements, no eviction whatsoever. People stayed where they used to live, in the very same house, however, the physical condition of the houses were improved. The re-arrangement of housing plots only included tidying up the form of several plots as to conform to the data at BPN (National Land Bureau) and another 8 plots to provide additional space for road improvement which increased accessibility to the area.

The form of upgrading without displacement by improving the physical condition of the environment (Davis, 2006; UN Habitat, 2003, Karanja, 2010) was chosen by Surakarta City for being inexpensive and humane in providing housing for low income population. It was also chosen because it gave the community the opportunity to stay in their lands and helped create social stability. Displacing slum inhabitants will only create new problems and worsen poverty without actually solving any problem in the urban area (UNESCAP, 2008; Das, 2009).

By upgrading without displacement the community may feel more comfortable, safer, and quieter, have healthier environment, and have better accessibility thus improving their economy (Payne, 2005; Boonyabanha, 2009). It may also reduce poverty in the urban area therefore helping governments in improving overall quality of life of the community. The forms of the upgrading which took place at the study area are as follows:

Table 3 : The Form of Upgrading in the Study Area

Item	Objects	Problems	Improvements	Benefits
1	House plots	Roadside lots are not properly aligned reducing the road width.	Plot rearrangement: - Conforming the plots to IK BPN - Reducing certain plots for infrastructure	Main road is now accessible to cars (for example ambulance and fire trucks)
2	House structure	Unhealthy house construction	improvement : - List plang - Rainwater drainage - Addition of windows and ventilation - Door repairs - Construction of the house - Wall repairs & paintings	- Better house facades - Protection from the sun and the rain - Stronger houses - Better interior conditions
3	Roads	Deteriorated dirt and gravel roads	- Repavement of the roads using pavement blocks	- Better function of the roads - Cleaner roads and less floods
4	Clean water	- Lack of clean water - Water is dirty and foul-smelling.	- Well improvements - Communal clean water supply	- The use of clean well water communally
5	Drainage	Trapped drainage and	- Construction and repair of	- Less floodings

Item	Objects	Problems	Improvements	Benefits
		service disparity	primary and secondary canals - Making of biopores - Construction of water infiltration boxes	- Cleaner environment
6	Sanitation	Lack of sanitation	- Communal toilets	- Better and cleaner toilets for everyone
7	Open Space	- Absence of empty land for park, parking and street vendors - No public space for socializing	- Plantation in the river banks - Plantation of productive plants - Building of fences - Provision of parking areas for cars and carts	- Better housing environment - Cleaner river environment - Better parking for carts and vehicles - Places for the community to socialize
8	Waste	No waste disposal system	- Waste management establishment - Socialization for cleaner living	- Less visible waste - Better behavior
9	Economics	- Low income - Lack of capital	- Training for home industry - Loans to home industry owners	- Extra income for the population - More job opportunities
10	Health	- Undernourished children - Frequent occurrence of dengue fever, diarrhea and typhus..	- Provision of nutritional foods - Treatment for dengue, typhus and diarrhea	- Better nutrition - Healthier environment and less disease

Source: analysis, 2013

The above table explained how upgrading without displacement served the rights of the people already having legal ownership of the land thus allowing them to employ their full capacity for improvement. Interview with Mr.Topo, a local figure, indicated improvements in both physical and non-physical aspects of the neighborhood, however; he warned that without proper maintenance the neighborhood may regress into a slum. Pictures and plan of the upgrading are shown below:



0 % development



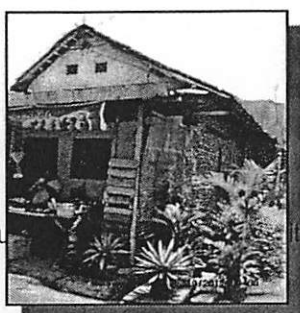
30 % development



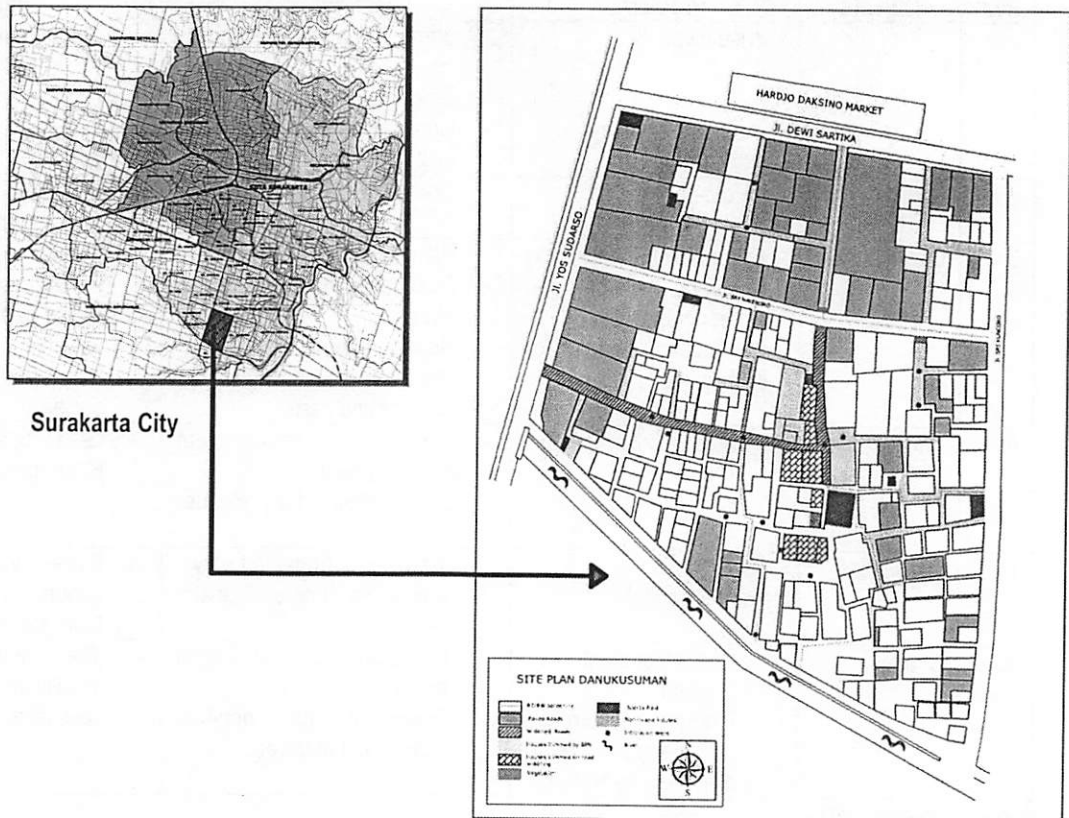
100 % development

Source : Bappeda of Surakarta City

Figure 1:
Improved Houses and Roads



Source



Map 2:
Slum Upgrading in the Study Area

CONCLUSION

Slum upgrading without displacement is an alternative to appreciate the legal ownership of the lands and whenever the location conforms to the urban development plan. Development without displacement will reduce poverty in the urban areas, provide investment opportunities in the provision of low income housings, improve livability and environmental sustainability, stabilize the communities socially and economically, and build better morale and pride. Political factor played an important role in the upgrading because the community believed a certain political figure in the area.

The form of the upgrading included housing improvement, infrastructure improvement, opening access and promotion of healthy living arrangements. The outcome has been the better tie between the community and the place it occupies. The challenge has been how to prevent the environment from returning into slum, and whenever possible to improve its condition even better. The presence of a key figure was needed to ensure sustainability and prevent environmental degradation. The community needs to have initiative in managing the quality of the environment, as opposed to waiting for another government grant or improvement program. There was a need for housing environment management team which may be established comprising the people involved in the early stage of the upgrading.

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REFERENCES

- Boonyabanha, Somsook. 2009. *Land for Housing the Poor – by the Poor: Experiences from the Baan Mankong nationwide slum upgrading programme in Thailand*. Environment & Urbanization Vol. 21(2): 309–329
- Davis, Mike. 2006. *Planet of Slums*. British Library Cataloguing in Publication Data
- Das, Ashok K. and Lois M. Takahashi. 2009. Evolving Institutional Arrangements, Scaling Up, and Sustainability Emerging Issues in Participatory Slum Upgrading in Ahmedabad, India. Journal of Planning Education and Research
- Groat, Linda N and Wang, David C. 2002. *Architectural Research Methods*. Published Simultaneously in Canada.
- Guba, Egon G and Yvonna S. Lincoln. 2005. Paradigmatic Controversies, Contradictions and Emerging Confluences, in Norman K. Denzin dan Yvonna S. Lincoln (editors): *The Sage Handbook of Qualitative Research*. Sage Publications Ltd, London.
- Karanja, Irene. 2010. *An Enumeration and Mapping of Informal Settlements in Kisumu, Kenya, Implemented by Their Inhabitants*. Environment and Urbanization 2010 Vol. 22(1):217-239
- Payne, Geoffrey. 2005. Getting Ahead of the Game: A Twin-Track Approach to Improving Existing Slums and Reducing the Need for Future Slums. Environment & Urbanization Vol. 17:135
- UNESCAP, UN-HABITAT. 2008. Perumahan bagi kaum miskin di Kota-Kota Asia. Masalah Penggusuran: Upayakan alternatif lain yang lebih berpihak kepada kaum miskin. Panduan ringkas untuk pembuat kebijakan.
- UN-HABITAT. 2003. *The Challenge of Slums: Global Report on Human Settlements 2003*. Earthscan Publications Ltd London and Sterling, VA
- Usavagovitwong, Nattawut and Prayong Posriprasert. 2006. Urban poor housing development on Bangkok's waterfront: securing tenure, supporting community processes. Environment & Urbanization Vol 18(2): 523–536
- Uitermark, J. and M. Loopmans. 2013. Urban Renewal without Displacement? Belgium's 'housingcontract experiment' and the risks of gentrification. Journal of Housing and the Built Environment 28.

CHILDREN'S PARTICIPATION IN OUTDOOR ENVIRONMENT IN URBAN MEDIUM AND HIGH COST HOUSING

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ABSTRACT

The study investigated children's participation in outdoor environment within medium cost housing and high cost housing in urban areas. Questionnaires and interviews were used with 70 parents who have children aged between 6-12 years old from both housing to explore children's affinity for outdoor environment by investigating the frequency of children using the outdoor environment to play. Number of children in high cost housing often (3-4 times a week) used the outdoor environment to play was found to be more compared to the children from medium cost housing. Meanwhile, the observation method for children's preference of places and activities found that the children from medium cost housing were more explorative in using the outdoor environment. Medium cost housing offered more option of places with rich natural elements to be explored. They liked to gather and play at the neighbourhood park (playground and play field), green belt and streets. Children from high cost housing play only at the neighbourhood park (playground and play field). Results suggest that children in urban areas still access the outdoor environment which offers them an opportunity to engage with many activities. The study highlights the importance of providing option of places in an outdoor environment that offer variety of sources for children to explore which subsequently can increase the number of children using the outdoor environment to play.

Key Words: Outdoor Environment, Children participation, Housing in Urban Area

INTRODUCTION

Previous studies have shown a declined in the number of children using neighbourhood outdoor environment to play in urban areas. This situation certainly has profound repercussions on the psycho-physical development of children (Castonguay and Jutras, 2010). Playground affords the children to play in an outdoor environment (Chawla, 1992) but Norshikah Daud (2003) found that children deserted their neighbourhood playgrounds after several months of use because they found that the playground area does not offer new opportunities or challenges to play. Children require challenging and exciting play environments where they can explore (Striniste and Moore, 1989). This issue is relevant to children in middle childhood (between 6-12 years old) as children explore extensively the neighbourhood area at this age (Chawla, 1992). Previous studies of children using the outdoor environment mostly focus on urban and rural area respectively. Studies on urban area rarely focus on children's participation in an outdoor environment of varying socioeconomic status housing areas. Furthermore, most studies on children's participation in outdoor environment pay attention only on poor neighbourhood with the assumption that outdoor environment plays a vital role for children from poor neighbourhood because they have limited spaces in home garden to play (Castonguay and Jutras, 2009), ignoring the children from other neighbourhood areas.

Play is a reflection of children development where they communicate, socialize, understand themselves and other people, deal with their problems and practice skills that may be used later in life (Hughes, 1995). Play in an outdoor environment gives many benefits to the children. It contributes to children's cognitive, social and physical development. According to Castonguay and Jutras (2009), play in outdoor environment can reduce children's stress and develop creativity (Munoz, 2009; Castonguay and Jutras, 2009). Various outdoor environment such as neighbourhood, parks, playground and natural environment offer rich sources of stimulation and affordances for children. According to Loukaitou-Sideris (2003), natural elements in neighbourhood area will give positive effects to children's development even if the area only has a tree. Play in outdoor environment with natural elements also develops children's empathy with the natural world and increase their environmental awareness (Vaselinoska, 2010).

It is important to protect outdoor play spaces from disappearance in order to promote cities that sustain children's development. Therefore, the study investigated children's affinity for outdoor environment by investigating the frequency of children using the outdoor environment to play, preference of places and their activities in the outdoor environment in an urban area for both medium and high cost housing. The aims of this paper are to understand the usage of outdoor environment for children to play, selection of outdoor places to play and opportunities that children could engage in outdoor environment for both housing type.

LEARNING AND PLAYING IN OUTDOOR ENVIRONMENT WITH NATURAL ELEMENTS

Play contributes to children cognitive, social and physical development. Playing in the outdoor environment offer various affordances that can stimulate their senses and generate cognitive skills (Olds, 1989). Previous studies also have shown that play in outdoor environment with natural elements develop children creativity. In addition, play in outdoor environment with the existing natural elements in neighbourhood areas can reduce children stress (Castonguay and Jutras, 2009). It shows the importance of green area in the outdoor environment for children health and development.

Children perceive outdoor environment with natural elements affording a variety of spaces for physical and social activities. Play in an outdoor environment gives opportunity for children to meet friends. Developing relationship with friends is an important factor in their growth and development (McDevitt and Ormrod, 2002). Research in psychology also found that children attachment and bonding are stronger with natural compared to man-made environment (Chawla, 1992; Kellert, 2002; Khan, 2002; Korpela, 2001; Ulrich, 1983). They perceived (1) nature is not man-made (2) nature is cyclic (3) nature have endless diversity and beauty (Prescott, 1987).

Children become more explorative in an environment that they find safe and comfortable. Natural elements in neighbourhood park also can attract them to be active in outdoor setting. They find it is exciting and challenging by having options to play instead only having playground equipment in neighbourhood park (Chawla, 1992). Even though playground has colour and different textures, children find that does not offer new opportunity or challenges in future play (Norshikah Daud, 2003).

Children need to be given the right to have a childhood environment enriched with trees enable them to increase confidence, heighten self esteem, create memories for their future and increase their environmental awareness. Children's interaction with the nature begins with childhood experiences (Kellert, 2002) and natural elements are the best resources for children to learn and love the nature (Coffey, 2001). Most of the environmental programs for children try to impart knowledge and responsibility before children develop a loving relationship with the nature (Sobels, 1996). Nowadays,

children are losing the understanding of the existing of the nature in their home yard and neighbourhoods, which further disconnects them from appreciation of the natural world. Therefore, they will have lack of environmental knowledge and environmental awareness in future. Thus, it is important to nurture children at the early stages on environmental awareness by having rich natural resources in their surroundings.

CHILDREN'S INTERACTION WITH OUTDOOR ENVIRONMENT IN URBAN NEIGHBOURHOOD AREAS

According to Chawla (2002) and Kytta (2003), children preferred to play in outdoor environment compared to indoor environment. Urban children have been found preferred to play in outdoor environment and neighbourhood park than home yard because of the sizes. Children tend to play in open spaces that offer bigger area for them to explore and far from home where natural elements exist (Mohd. Suhaizan Shamsuddin and Ismail Said, 2008). The above statement also consistent with a study by Min and Lee (2006) in Hanson Village, Korea, that shows children in an urban area like to play in the outdoor environment compared to indoor environment. In contrast with the above statement, previous study by Bixler and Floyd (1997) found that urban children preferred to play in indoor environment because they like the comfort to be in an air conditioned indoor space.

Frequency of visiting a place everyday also affects their preference of places. Children like places that they visit every day (Min and Lee, 2006). Children also tend to visit the place that they find safe and comfortable. Furthermore, children appreciate places that are exciting, challenging and offer them the option and opportunity to engage in many activities. They also value places that give the opportunity to meet friends (Korpela et al., 2002; Min and Lee, 2006).

According to Castonguay and Jutras (2009), participation of children in the outdoor environment of different socioeconomic status housing areas might be different. Children from poor neighbourhood areas might spend more time in outdoor environment because they live in a small house or apartment. Castonguay and Jutras (2009) also stated that the outdoor environment plays a vital role for children from poor neighbourhoods compared to advantaged area. This study looks further on the other neighbourhood types; the medium and high cost housing in an urban area.

METHODOLOGY

The neighbourhood chosen for the study are Taman Bertam Indah and Penang Golf Resort as both are located in Bertam, new township. The site is located in Seberang Perai Utara District and nearby North-South highway (PLUS). Both housing located close to each other so that the findings are not affected by the differences of social and cultural aspects.

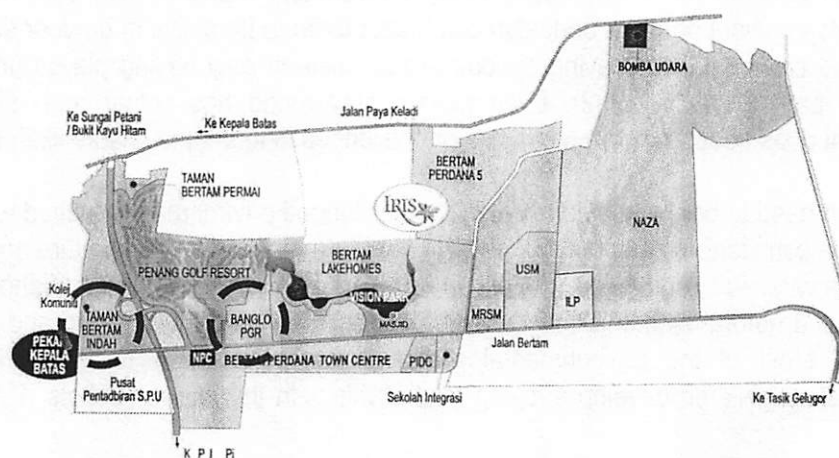


Figure 1

Location Map of Case Study

For medium cost housing, Taman Bertam Indah has 6 Phases. The site chosen is only 4A & 4B comprise of 225 units houses. Green areas in the housing include neighbourhood park and green belt covering approximately 7, 348m².

Penang Golf Resort (PGR) for high cost housing has 3 Phases PGR 1, PGR 2A and PGR 2B which consist of 152 units of bungalows. The area for neighbourhood park or green area of this housing is 990m².

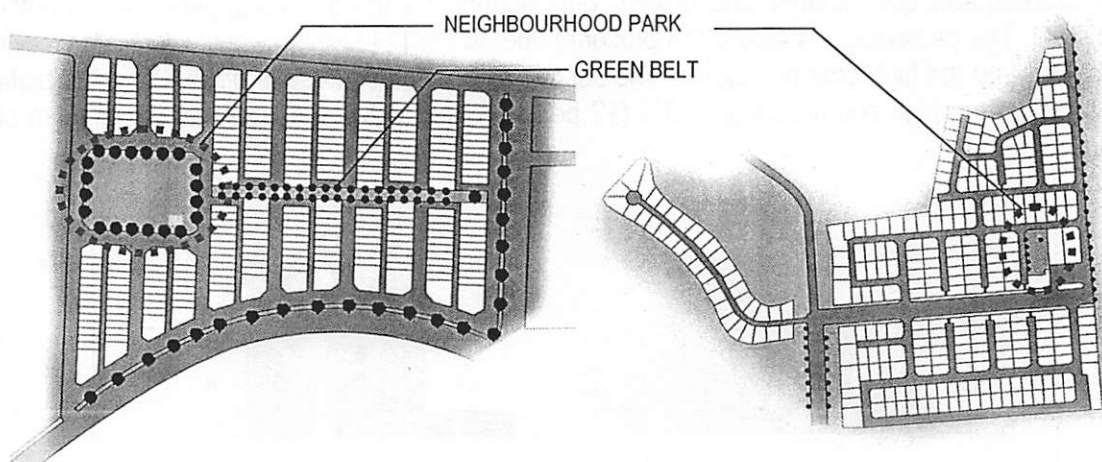


Figure 2

Housing Plan of Taman Bertam Indah and Penang Golf Resort.

The study investigated the children aged between 6-12 years old on the frequency of using the outdoor environment to play, preference of places in neighbourhood area and their activities. The green areas in medium cost housing were neighbourhood park (playground and play fields) and green belt. In contrast, high cost housing only has neighbourhood park (playground and play fields).

Research was conducted using interviews, questionnaires and observation. The interviews and questionnaires deal with the frequency of children using the outdoor environment to play whereas observation was used to collect preference of places to play and their preferred activities. Parents were the respondents for interviews and questionnaires on frequency of children using the outdoor environment with assumptions that parents observed their child behaviour and activities. According to Prezza et al; (2005), children behaviour influenced by parents perception. All data collection from both housing took 6 weeks, 4 weeks for interviews and questionnaires and another 2 weeks for observation.

Researcher had to do field interviews to get to know which parents have child age between 6-12 years old. Total sample for both housing is 70 persons, 40 persons from medium cost housing and 30 persons from high cost housing respectively. The entire interviews were conducted from 10 am-12 pm and 4-7pm. The reason was most of parents did activities in home garden or yard during this hour so that it is easier to be approached by the researcher rather than to call them from inside of the house.

The observation was intended to understand children's preference of places and activities. What are their preferred places to play and what are their preferred activities? Are they different from both housing type? Neighbourhood park and neighbourhood surrounding example green belt, streets, playground and play field were the focus areas for this observation. To avoid possible biases of observation time and day, observation schedule was constructed. The observation took place in the evening on weekdays and weekends.

RESULTS AND DISCUSSIONS

Frequency of Children Using the Outdoor Environment to Play

Frequency of children using the outdoor environment to play was divided into 4 categories *every day*, *often (3-4 times a week)*, *seldom (1-2 times a week)* and *never*. As can be seen in Figure 3, most of children from both neighbourhood areas only *seldom (1-2 times a week)* played in the outdoor environment. The percentage is 45.0% (18 persons) and 46.7% (14 persons) respectively for medium cost housing and the high cost of housing. The second highest percentage is *often* where the highest percentage is from high cost housing 40.0% (12 persons) and 27.5% (11 persons) for medium cost housing.

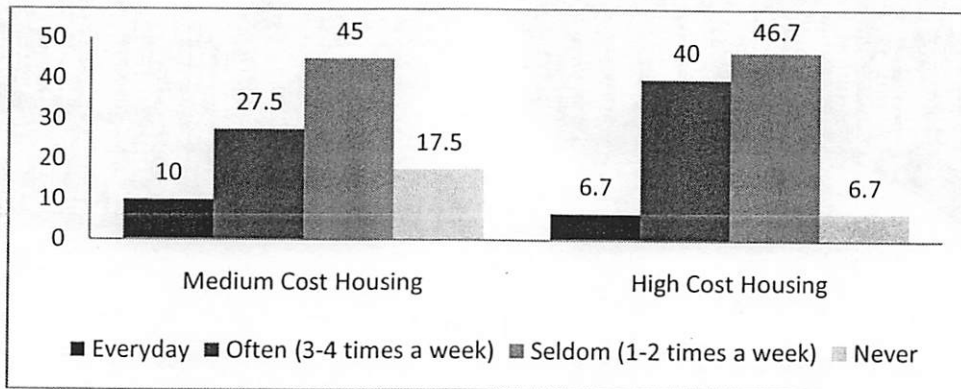


Figure 3

Frequency of Children Use the Outdoor Environment to Play

The percentage for *everyday* and *never* from medium cost housing is the highest. For *everyday* percentage, 10.0% (4 persons) and 6.7% (2 persons) for medium cost and high cost housing respectively. Meanwhile for *never*, children who did not play in neighbourhood park is highest from medium cost housing 17.5% (7 persons) and only 6.7% (2 persons) from high cost housing.

The results suggested that even though most of the children in both housing only *seldom* used the neighbourhood park to play, they still curious and eager to play in outdoor environment. Based on the interviewed with the parents from both housing, they *seldom* play in outdoor environment because they involved in other activities such as tuition classes, swimming class etc. Finding is consistent to a study by Valentine and McKendrick (1997) that explained nowadays, children involve in organized activities which limit their time to explore the outdoor environment to play.

The difference between both housing areas was the number of children *often* plays in the outdoor environment. Number of children *often* play in the outdoor environment was higher in the high cost housing compared to the children from medium cost housing. This result is discord to the study by Karsten (2005) that children from medium cost housing always play in outdoor environment because

they have limited sizes of home yard for play. Other than that, the main difference between both housing areas was the number of the children *never* used neighbourhood park and outdoor environment for play was more from medium cost housing compared to high cost housing. Interviewed with the parents in both housing revealed that parent's hesitancy level from crime possibility is higher in medium cost housing compared to high cost housing. This might lead to the findings and interviewed also found that children for parents who have lower hesitancy *often* play in the outdoor environment.

In summary, most of the children from urban areas still access the outdoor environment to play. They still have affinity towards the outdoor environment which will give benefits for their health and well-being development. The results on the frequency of children using the outdoor environment to play also prove finding from Evan (2004) that the number of children using the outdoor environment to play is declining and this situation is worse in poor neighbourhood and medium cost housing compared to high cost housing or advantaged areas.

Children's Preference Places to Play in Outdoor Environment

Observation found that children from medium cost housing explored neighbourhood area to play. They played at neighbourhood park, streets and green belt area. They found that the stated places offer various opportunities for them to explore and they can meet friends. Shaded green belt area becomes children's preferred place especially for girls to gather and meet friends. They feel safe and comfortable in the shaded green belt area which connected their home to the neighbourhood park. This finding is consistent with a study by Korpela et al. (2002) and Min and Lee (2006) that shows children appreciate places that give them the opportunity to meet friends. The results also accord to the studies by Chawla (1992) and Olds (1987) that explained children are more explorative and comfortable in the environment that they find safe.

The children were mobile moving from neighbourhood park to neighbourhood surroundings. They found that the neighbourhood park do not offer them a challenging and explorative activities. The study also revealed that children liked to gather under shaded area. Shaded area offered them a sense of belonging to the place. This finding is parallel with a study from Chawla (1992) and Korpela (2002) that shows children like environment that have natural elements. Results also consistent with a study by Castonguay and Jutras (2009) that most children relate nature as their liked places. They are sensitive to the natural elements in their surroundings, such as trees, water and other natural elements.

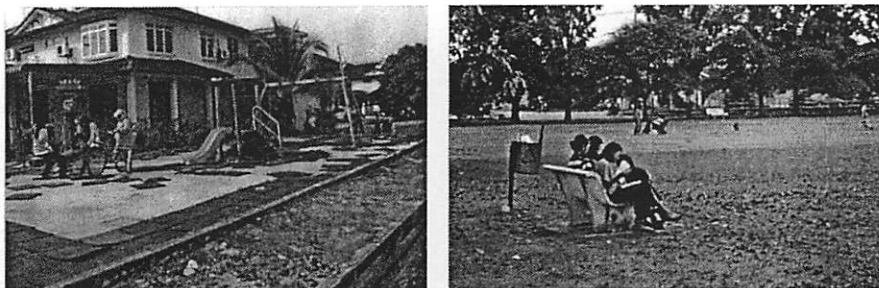


Figure 4

Green belt as a place to meet friends and reading activity under shaded area

In contrast with the medium high cost housing, even though the number of children from high cost housing *often* used the outdoor environment to play was more, they only played at the

neighbourhood park. The reason was the neighbourhood surrounding do not offer opportunities for children to explore and play. There were lack of shaded area and natural elements in the neighbourhood.

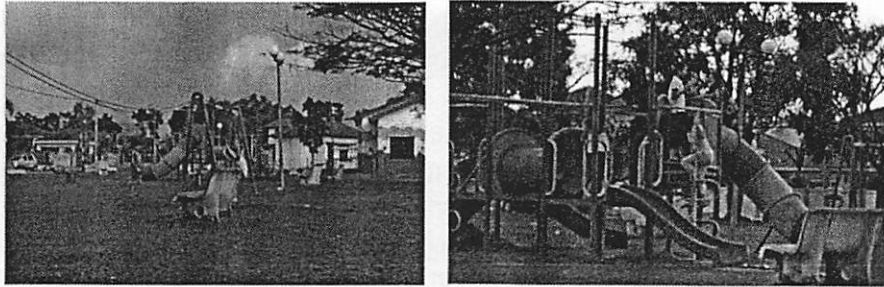


Figure 5

Children in High Cost Housing use the neighbourhood park to play

Children's Activities in Outdoor Environment

In medium cost housing, children used playground, play field, green belt and streets to play. Their activities included playing football, reading, running, meet friends, cycling, laying on field and play with the playground equipment. Boys especially 11 to 12 years of age preferred to play football. Meanwhile girls meet friends, reading and played with the playground equipment. They also created their own games such as '*baling kasut*'. They liked to gather under the shaded area as they find that trees or shaded area give senses of belonging to them. Findings accord with a study by Hart (1979) that explained place of preferences varies by gender and age of children. Girls tend to play in green areas and close to their home while boys tend to favour rather remote settings and play field.

Girls meet friends at green belt area even though the equipment cannot be used and the rubber mat is not all in place. Results suggest that children are curious to explore and eager to play in the outdoor environment even though the quality of the playground and green belt is not in a good condition parallel to the study by Chawla (2004). Children perceived play in the outdoor environments offer various exciting and challenging activities, provide them the opportunity to choose, make decision, experiment, imagine and create new things.

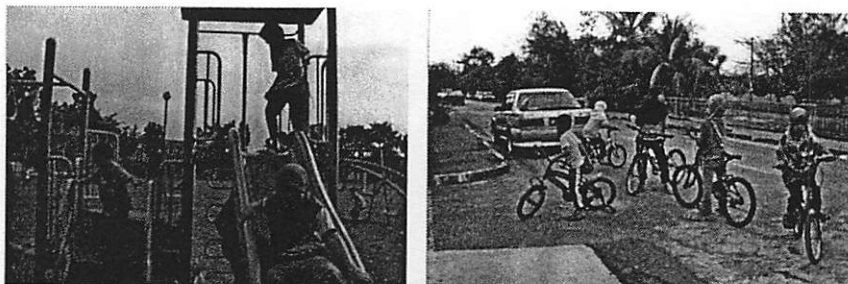


Figure 6

Children play with playground equipment and cycling on the streets

Results for children activities in high cost housing is parallel with the findings from medium cost neighbourhood, boys liked to play football whereas girls liked to meet friends. Results also found that

boys in the high cost neighbourhood preferred to play indoor compared to outdoors. The children appreciated the outdoor environment to play but lack of natural elements and bad quality of playground equipment limits the opportunity for them to explore.

In summary, children do various activities in a place and some of them mobile moving from neighbourhood park to street and green belt to meet friends and do other activities. They found that the outdoor environment offer a bigger space for them to play and explore.

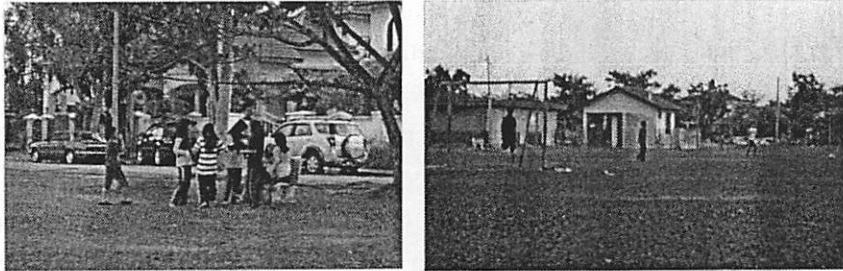


Figure 8

Meet friends and play football is example of children's activities in High Cost Housing

CONCLUSION

Play in an outdoor environment is vital for children development. Natural elements in the outdoor environment give opportunities for children to explore and become more creative. The design of outdoor environment in housing area must provide as many as opportunities for children to explore. Children engage in many activities in a place show their effort to create needed affordances within the place. In fact, providing option of places for children to explore beneficial for different gender and give vary potentials for children's use. These options can increase the chances for children to play in the outdoor environment and increase the children affinity for outdoor environment. Research conducted to understand children's affinity for outdoor environment by investigating the frequency of using the outdoor environment to play, preferences of places and preferred activities. Designers are advised to understand the importance of the outdoor environment before the design process to make sure the design can sustain children's development. Results of this study also suggest that natural elements in neighbourhood area give sense of safety which attracts children to play in the outdoor environment. Apart from the commonalities between high cost and medium cost housing children's activities, the difference existed between both might be because the outdoor environment setting for both housing was different. Further studies should pay attention the same setting for the different socioeconomic housing area. Findings may only applicable for landed housing areas and may be not relevant for children in the high rise housing areas. Moreover, further study should be done with children rather than on children to avoid intimidation which may ignore the power of imbalances between adults and children.

REFERENCES

- Castonguay, G., & Jutras, S. (2009). Children's appreciation of outdoor places in a poor neighbourhood. *Journal of Environmental Psychology*, 29(1), 101-109.
- Castonguay, G., & Jutras, S. (2010). Children's use of the outdoor environment in a low-income

- Montreal neighbourhood. *Children, Youth and Environments*, 20(1), 200-230.
- Chawla, L. (1992). Children place attachments. In I. Altman & S. M. Low (Eds.), *Place attachment* (pp. 63-86). New York: Plenum Press.
- Chawla, L. (2002). *Growing up in an urbanising world*. London: Earthscan.
- Coffey, A. (2001). *Transforming School Grounds*, in *Greening School Grounds: Creating Gabriola Island*, BC: New Society Publishers.
- Bixler, R. D., & Floyd, M. F. (1997). Nature is scary, disgusting, and uncomfortable. *Environment and Behaviour*, 29(4), 443-467.
- Evans, G. (2004). The environment of childhood poverty. *American Psychologist*, 59, 77-92.
- Hughes, F. P. (1995). *Children Play and Development*. Boston: Allyn and Bacon.
- Hart, R. (1979). *Children's Experience of Place*. New York: Irvington.
- Karsten, L. (2005). It all used to be better? Different generations on continuity and change in urban children's daily use of space. *Children's Geographies*, 3(3), 275-290.
- Kellert, S. R. (2002). Experiencing Nature: Affective, Cognitive and Evaluative Development in Children. In P. H. Khan & S. R. Kellert (Eds.), *Children and Nature* (pp. 117-151). Cambridge: MIT Press.
- Korpela, K. (2002). Children's environment. *Handbook of Environmental Psychology*, 363-373.
- Kellert, S. R. (2002). Experiencing Nature: Affective, Cognitive and Evaluative Development in Children. In P. H. Khan & S. R. Kellert (Eds.), *Children and Nature* (pp. 117-151). Cambridge: MIT Press.
- Korpela, K. (2001). Children's environment. In Bechtel, R.B, Churchman & A (Eds.), *Handbook of Environmental Psychology*. New York: John Wiley and Sons.
- Korpela, K. (2002). Children's environment. *Handbook of Environmental Psychology*, 363-373.
- Kytta, M. (2003). *Children in outdoor contexts*. Espoo: Helsinki University of Technology.
- Loukaitou-Sideris, A. (2003). Children's Common Grounds: A Study of Intergroup Relations among Children in Public Settings. *Journal of the American Planning Association*, 69(2), 130-144.
- Mc Devitt, T. M., & Ormrod, J. E. (2002). *Child Development and Education*. New Jersey: Merrill Prentice Hall.
- Min, B., & Lee, J. (2006). Children's neighbourhood place as a psychological and behavioural domain. *Journal of environmental psychology*, 26(1), 51-71.
- Mohd. Suhaizan Shamsuddin, & Ismail Said (2008). Middle childhood children interaction with home and neighbourhood gardens in urban and rural setting. Paper presented at the 2nd International Conference On Built Environment in Developing Countries.
- Moore, R. (1989). Plants as play props. *Children's Environments Quarterly*, 6(1), 3-6.
- Munoz, S. (2009). Children in the Outdoor Retrieved 12 December, 2009, from <http://www.countrysiderecreation.org.uk/Children%20Outdoors.pdf>
- Norshikah Daud (2003). *Personal Communications: National Landscape Department, Kuala Lumpur*.
- Olds, A. R. (1987). Designing Settings for Infants and Toddlers. In C. S. Weinstein & T. G. David (Eds.), *Spaces for Children: The Built Environment and Child Development* (pp. 117-138). New York: Plenum Press.
- Prescott, E. (1987). The Physical Environment and Cognitive Development in Child-care Centres. In Weinstein, C.S & T. G. David (Eds.), *Space for Children* (Vol. 73-87). New York: Plenum Press.
- Prezza, M., Alparone, F., Cristallo, C., & Luigi, S. (2005). Parental perception of social risk and of positive potentiality of outdoor autonomy for children: The development of two instruments. *Journal of environmental psychology*, 25(4), 437-453.
- Sobel, D. (1996). *Beyond Ecophobia: Reclaiming the Heart of Nature Education*, Great Barrington, MA:

The Orien Society.

- Ulrich, R. S. (1983). Aesthetic and affective response to natural environment. In I. Altman & J. F. Wohwill (Eds.), *Human Behaviour and Environment: Behaviour and the Natural Environment* (Vol. 6). New York: Plenum Press.
- Olds, A. R. (1989). Psychological and Physiological Harmony in Child Care Center Design. *Children's Environment Quarterly*, 6(4), 8-16.
- Valentine, G., & McKendrick, J. (1997). Children's outdoor play: exploring parental concerns about children's safety and the changing nature of childhood. *Geoforum*, 28(2), 219-235.
- Vase Vaselinoska, S., S., Petrovska, S., Zivanovic, J. (2010). How to help children understand and respect nature?. *Procedia Social and Behavioral Sciences*, 2, 2244-2247.

ROLE OF STREET-LEVEL OUTDOOR THERMAL COMFORT IN MINIMIZING URBAN HEAT ISLAND EFFECT BY USING SIMULATION PROGRAM, ENVI-MET: CASE OF AMMAN, JORDAN

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ABSTRACT

This study determines to what extent does computer modelling and simulation contribute to assessing methods in planning of rural and urban regulations related to lowering the effect of urban heat island. This was achieved by examining global warming and its relationship with urban heat islands and outdoor thermal comfort through relationship, definitions, problem, causes, parameters and mitigation techniques. The aim of the study is to assess urban design aspects, such as height and width ratio, positioning of buildings and provision of shade, and their role in the enhancement of urban microclimate which will have positive effects on both energy use in buildings and outdoor thermal comfort of pedestrians. This was followed by studying Jordan's practices in building regulations for related factors in order to choose parameters to apply in computer simulation program application, theories and experiments, giving out timeless and expense-less solutions and suggestions. Sample of chosen attributes and parameters were applied on a hypothetical typical of residential zone type (C) in the city of Amman, to finalize solutions in possible building regulations and recommendations.

Key Words: Urban heat effect, Envi-Met, Amman, Building regulations

INTRODUCTION

During the period from 1990 to 2020, the urban population in the developing world is expected to increase by about 25%-45%, except in Latin America and the Caribbean where the urban population already exceeds 70%. By 2020, the urban population is expected to be greater than the rural population in all parts of the world except sub-Saharan Africa and South Asia. [World Bank 2002].

In 2020, 3.5 billion people in developing countries will live in cities, and Africa and Asia will be predominantly urban, as Latin America already is. Such rapid growth puts high pressure on cities, contributing to urban heat islands. [Orn, 2002].

Thereafter, the environment is negatively impacted by urbanization. This is caused by the production of pollution, changes in the atmosphere properties, and harmfully impacting soil covers. Table 1 shows General characteristics of the urban climate.

As urban areas develop, changes occur in their landscape. Buildings, roads, and other infrastructure replace open land and vegetation. Surfaces that were once permeable and moist become impermeable and dry.

These changes cause urban regions to become warmer than their rural surroundings, forming an "island" of higher temperatures in the landscape. [EPA, 2005]

Mean air temp:	1-3°C warmer (occasionally up to 12°C)
Evaporation:	50% less
Pollution:	10-25% higher concentrations
Cloudiness:	5-10% more
Solar radiation:	5-25% less
Mean wind speed:	20-50% less
Turbulence:	10-50% greater

Table 1: General characteristics of the urban climate [Johansson, 2008]

Heat islands occur on the surface and in the atmosphere. On a hot, sunny summer day, the sun can heat dry, exposed urban surfaces, such as roofs and pavement, to temperatures 50–90°F (27–50°C) hotter than the air while shaded or moist surfaces—often in more rural surroundings—remain close to air temperatures. Surface urban heat islands are typically present day and night, but tend to be strongest during the day when the sun is shining.

In contrast, atmospheric urban heat islands are often weak during the late morning and throughout the day and become more pronounced after sunset due to the slow release of heat from urban infrastructure. The annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F (1–3°C) warmer than its surroundings. On a clear, calm night, however, the temperature difference can be as much as 22°F (12°C).

Though heat islands may form on any rural or urban area, and at any spatial scale, cities are favoured, since their surfaces are prone to release large quantities of heat. Nonetheless, the UHI negatively impacts not only residents of urban-related environs, but also humans and their associated ecosystems located far away from cities. In fact, UHIs have been indirectly related to climate change due to their contribution to the greenhouse effect, and therefore, to global warming. [Urban heat island, 2000].

Probably no effect of urban transport attracts more debate than the environmental impact of motorised traffic. In some mega-cities with unfavourable conditions- Santiago, Mexico, Tehran, Dhaka- air pollution is visible as smog and is directly harmful. As motorization gains momentum in the world, an enormous urban population is about to be affected. These effects are not only local (although this is bad enough) but many experts are warning of the serious potential effects of global warming in a world where motorization multiples and is driven by bad engines and poor fuel. [Om. 2002].

However, the city most related to the concepts of smog, Los Angeles, has largely managed to combat it. Even in Bangkok, ill reputed for its notorious traffic problems and air pollution, a turn to the better has been possible. [Om. 2002].

Urban areas act as climate modifiers. Climate elements, such as solar radiation, air temperature, humidity and wind are affected by the urban fabric. Nocturnal urban-rural temperature differences of 6 C or more are common in the centres of major cities. This indicates that the average diurnal temperature rise due to urbanisation may be greater than the estimated 1- 3.5 C rise in temperature due to global climate change over the next 100 years. [Johansson, 2005].

Heat islands may skew long-term temperature records as urbanization encroaches on weather stations located near the outskirts of town. Consequently, researchers must remove heat island effects from temperature records to accurately estimate climate change. The Intergovernmental Panel on

Climate Change (IPCC) has concluded that the impact of urban heat islands on temperature records is "real but local," and has only a negligible effect on regional or global trends. The IPCC also noted that urban heat island effects on local climate appear to include changes in precipitation, clouds, and daily temperature range. [Trenberth, 2007].

URBAN HEAT ISLANDS IN JORDAN

Due to the increase in energy demand, cost and the scarcity of water, Jordan's Government has established different institutions to address environmental, social, and economic aspects of sustainability. Other non-governmental organizations are working on the same issues to find the best solution to conserve Jordan's water, energy, and the environment. Jordan has identified the role that laws and regulations can contribute to the implementation of best practices for conservation. [USAID, 2009].

Jordan is privileged with an exceptional geographic location and incomparable environmental circumstances; therefore, the use of clean energy sources in Jordan is very low. However, energy use by the residential sector in Jordan is 24% of the total expenditure, which is equal to that of the industrial sector. [NERC, 2008].

As the living standard increases, people tend to install heating and/or cooling equipment in order to overcome the problem of poor thermal comfort. For buildings not adapted to the climate, energy use – and consequently costs – will be excessively high and the impact on the environment will be negative. This impact is translated into many forms; one of them is heat island formation.

FIELD STUDIES

Field studies in numerous cities, mainly in temperate climates, have shown that the magnitude of nocturnal heat islands increases with increasing H/W ratio (reduced SVF) of street canyons. In the day the urban canyon is a good absorber of solar energy and due to the relatively high thermal capacity of urban surface materials, this energy is stored in the fabric and not released until after sunset. The largest urban-rural temperature difference occurs on calm and cloudless nights. Under such conditions, nocturnal heat islands of up to 12°C have been recorded. [Johansson, 2005]

URBAN MICROCLIMATE

As for the urban microclimate, studies showed that more shade on the street level is necessary to provide a climate-conscious urban design that takes the hot summer conditions into account. This can be provided through a more compact urban design with higher height-to-width ratios of urban street canyons than those currently applied and through different forms of overhead shading, e.g. arcades and other types of covered walkways. However, the cold season also has to be considered and some wider streets and open public spaces should be designed for solar access. The urban codes of Amman were found to be inappropriate and need to be changed to promote shading of pedestrians. [Johansson, 2005]

Almost all studies show that nocturnal urban heat islands are at their largest during dry season. They typically varied by between 2 to 5C. [Lindquist, 2005].

Daytime conditions have gained far less attention than nocturnal heat islands, although the former are more important from a human comfort point of view. [Johansson, 2005].

COMPUTER SIMULATIONS

What-if scenarios are fascinating. Aided by computer simulations, they become a tool to test drive multiple virtual models of the building design before wasting any resources on materials. [Eleanor, 2002].

A model is a simplified representation of the real world. [Lave and March, 1993]. In one step, the process of exploring iteration can be taken after creating the base case of the model, to perform parametric studies. This is by investigating the microclimate results consequences of various schemes. Parametric studies are set of measurable factors, such as temperature and pressure that define a system and determine its behaviour and are varied in an experiment.

NUMERICAL MODELS PREDICTING URBAN MICROCLIMATE

A large number of numerical models predicting different urban climate variables have been developed. Most Computational Fluid Dynamics (CFD) programmes are complex and require a high level of expertise.

Ali-Toudert and Mayer (2005, 2206) simulated the microclimate of the desert city of beni-isque (32 N), Algeria using the computer simulation programme *ENVI-met* (Bruse 2006). They found that during hot dry summer conditions, the temperature decreased by about 3 C when the H/W ratio increased from 0.5 to 4 and that north-south streets were slightly cooler than those oriented east-west. Their investigations were restricted to the summer season. Swaid et al. (2003) simulated air temperatures for Tel Aviv (32 N), Isreal, using the *CTTC model* (Swaid and Hoffman 1990) and also found lower air temperatures for north-south than east-west.

TOOLS

There are simple tools for measuring effects of urban heat islands and others that are advanced and need special experienced personal to perform. The aim of the following review is to study these tools and reach to the point where we find that the software *ENVI-met* is the most suitable for this field of study.

Simple tools are the following examples:

- Shade calculation (Shadow)
- Solar absorption (Townscope)
- Mean radiant temperature (RayMan)
- Air temperature (by Cluster Thermal Time Constant (CTTC) model, scale models, and climatic maps.

Advanced tools are the following examples

- Mesa-scale models (whole city)
- Micro-scale models (street level)
- *ENVI-met* 3.0

ENVI-MET SIMULATION PROGRAM

ENVI-met was created by Michael Bruse. It is a computer programme that predicts microclimate in urban areas. It is based on a three dimensional Computational fluid dynamics (CFD) and energy balance model. The model takes into account the physical processes between the atmosphere, ground, buildings and vegetation and simulates the climate within a defined urban area with a high spatial and temporal resolution, enabling a detailed study of microclimatic variations. The horizontal model size is typically from 100m X 100m to 1000m X 1000m with grid cell sizes of 0.5-5m. The fact that the

programme requires limited input data and that the modelling of the urban area is simple, makes it user friendly.

1. Input data:

The input data consists of the physical properties of the urban area of study and limited geographical and meteorological data. The required input data for the buildings are dimensions, reflectivity, U-value and indoor temperature, which are all constant for all buildings. The model uses detailed data on soils, including thermal and moisture properties. Both evapotranspiration and shading from vegetation is taken into account. The required geographical and metrological input data are longitude and latitude, initial temperature and specific humidity, wind speed and direction and cloud cover. Summary of input data concerning Climate data is Latitude and longitude, Wind speed, Initial air temperature and humidity. Summary of input data concerning Urban design data is Urban geometry, Trees, Building material properties and Soil properties

2. Output data:

The model provides a large amount of output data including wind speed, air temperature, humidity and Mean radiant temperature (MRT).

3. Limitations:

ENVI-met limitation is that it doesn't take into account the thermal mass of building envelope, and the indoor temperature has to be constant which is not realistic. This will affect mean radiant temperature and air temperature.

4. Objectives:

There are few user-friendly computer programmes and tools that can predict the influence of urban design on the urban microclimate with good precision. Existing programmes tend to be either too complicated or their output is too limited. This is all on the contrary of ENVI-met program.

THE CASE OF AMMAN

The aim of the study is to define the preferred case for each of the following, considering that the preferred case is the case that has the maximum temperature during winter and minimum temperature during summer:

- The preferred street width for the current Type C residential regulations for street widths
- The preferred building height for the residential type C.
- The best location for trees on the street that might contribute to improving street climate.
- The best street/building height ratio for pedestrian streets
- Suggesting modification in the current setbacks that will result in improved thermal conditions in the urban areas.
- The preferred street orientation for the residential sector type C.

The results can be used for some of the commercial buildings regulations.

Station: Amman, University of Jordan		Latitude: 32°										
Source: Meteorom, Jordan Climate Handbook		Longitude: 35°										
Data collected by: Tala Awadallah		Altitude: 980 m										
Solar radiation												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunshine												hours/day
real	5,10	5,90	7,00	8,30	10,40	11,90	12,10	11,40	10,00	8,40	6,70	5,00
max.	10,13	10,86	11,84	12,84	13,68	14,09	13,87	13,14	12,16	11,16	10,32	9,91
	50%	54%	59%	65%	76%	84%	87%	87%	82%	75%	65%	50%
Radiation												MJ/m²day
	11,03	12,96	17,70	22,40	26,80	30,70	32,70	27,29	24,20	19,25	13,90	10,54
Temperature												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Extreme Max	24,0	25,1	26,3	33,0	39,0	38,3	39,0	41,5	39,0	34,6	28,0	24,8
Mean Max	10,1	11,5	15,0	20,2	25,2	28,1	29,5	29,6	28,3	25,1	18,2	12,4
Mean	6,4	7,4	10,2	14,6	18,9	21,9	23,6	23,6	22,2	19,0	13,1	8,4
Mean Min	2,7	3,2	5,4	8,9	12,5	15,7	17,7	17,6	16,0	12,8	8,0	4,3
Extreme Min	-8,3	-4,5	-6,5	-1,5	1,4	4,5	8,5	8,8	4,5	3,4	-2,0	-4,8
Precipitation												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	346	285	234	268	54	0	0	0	5	92	204	305
Average	110	98	87	25	5	0	0	0	0	10	48	90
Minimum	74	64	58	18	3	0	0	0	0	8	31	58
Humidity												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Max	79	74	67	58	51	50	52	54	56	56	64	75
Average	74	69	62	53	46	45	47	49	51	51	59	70
Mean Min	69	64	57	48	41	40	42	44	46	46	54	65
Wind												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direction	SW	SW	SW	S	S	S	S	S	S	S	SW	SW
Speed	2,6	2,6	2,5	2,5	3,0	2,0	2,2	2,0	1,9	2,2	2,2	2,4

Table 2: Climate Data for University of Jordan Station [Metrological Department, Jordan, 2005]

1. Geography

Amman is known to have a wide variation of landscape components, hills and valleys, even and uneven land, therefore, different variations of climate are experienced all over Amman throughout the year. The lowest part of Amman is presented by the amphitheatre station down town with altitude of 730m above sea level, & the highest (approximately) is presented by Jordan University station, 980m above sea level, where the case study zoning will be applied. See Figure 23 for an overview of the city of Amman.

2. Climate

Being on a high altitude, with 35°E longitude and 32°N latitude, climate can be cold to very cold in winter and warm to hot in summer, with south-west and south winds through the year, and quite a good amount of rain fall compared to the hot- arid climate of Jordan. The data collected was taken for the Jordan university station, which has the same altitude and nearly the same latitude as the newly built areas in Amman city that applies Greater Amman Municipality regulations. The values were put in a certain excel sheet template as in table 2.

3. The building sector in Jordan

During the development process Jordan has invested a considerable amount of its scarce financial resources in the construction industry, building houses, hotels, banks, schools, etc. for both the public and private sectors. It is expected that this sector will expand even more in the coming years

due to the growing need for good quality housing in Jordan for the expected population of about 6 millions by that time. The construction sector accounts for 15% of the GDP and about 10% of the labour force. The Building activity in Jordan measured by the area licensed for construction grew by 26.4% between January and July 2000 over the same period in 2007 reaching 2,757,500 square meters. This is mainly attributed to residential buildings. [Department of Statistics. 2009].

This can contribute to further urbanization and growing of the city, which will for sure contribute to urban heat island effect. Furthermore, when temperatures rise during the day and they don't have to time to cool at night, the urban environment will not be hospitable for pedestrians to enjoy the outdoors inside the city, without any outdoor thermal comfort.

4. Urban zones and regulations:

The following material is extracted from "Building Regulations and Zoning in Amman" Amman Municipality.

Building Materials

Reflective materials that might upset the surrounding neighbours or might present hazard to public safety are forbidden. Not more than 20% of the exterior elevations are allowed to be painted with colours other than the colour of stone or white.

Building Setbacks:

Table 3 shows the regulations of buildings for residential building sector, setbacks, width of street facade and maximum building percentage on the plot.

Residential buildings height:

Subject to any special provisions indicated on the structural or detailed drawings, the building height in the housing sectors will be limited to **four floors** apart from the roof provided that the building will not be higher than 15m above the ground floor's tile level.

Balconies are not allowed to exceed the building line that was granted a permit except for the architectural projection and these should not exceed 0.75 m from the building line for buildings below street level.

5. Computer Simulation

Based on the regulations mentioned above and on the information from the municipality about street widths, the following model was adopted as prototype to be used for Urban Simulation:

Climate data:

Climate data including temperatures, wind speed and direction, solar radiation and rainfall from Jordan Climatologically Data Handbook was used in the simulation. August was chosen to be studied for the summer season and January for the winter season. A special software was used to simulate climate data of Jordan, and the exact location of Amman, to be able to use it in the ENVI-met program.

Comparison between different cases:

The model adopted for residential buildings is based on a type C residential zoning, this type was chosen because it is the most common type specially for area that were recently regulated, taken the inflation in land prices this type became common as it provides the minimum area that can be used to build proper residential building and at the same time is economical because of its low area. The street width for the base case will be 12 m; street widths of 16 and 20 will be compared in order to identify the best street width that will provide the most acceptable street climate. A Street surrounded by eight residential plots

will be used as a model for simulation; Table 4 includes a description for the original case and the different cases that will be studied. Data will be measured for the central point in the middle of the street.

Sector	Area (m ²)	Width Street Façade (m)	Setback			Maximum building percentage
			front	Side	Back	
Housing Area						
Sector A	1000	25	5	4	7	39
Sector B	750	18	4	4	6	45
Sector C	500	15	4	3	4	51
Sector D	300	13	3	2.5	2.5	51

Table 3: Base case and other cases to compare results

Case Name	Type	Street width	Sidewalk finish	Building height	Street Orientation
Base Case	Residential type C	12m	Light	4 floors 12 m	West-East
Case Street 8	Residential type C	8m Ratio= 1.5	Light	4 floors 12 m	West-East
Case Street orientation	Residential type C	12m	Light	4 floors 12 m	North-South
Case trees effect	Residential type C – Trees added at the sidewalks	12m	Light	4 floors 12 m	West-East
Case sidewalks colour	Residential type C	12m	Extra Light	4 floors 12 m	West-East
Case with Arcades	Residential type C	12m	Light	With arcade	West-East

Table 5: greater Amman municipality regulations

Modelling

According to the method of the study, different cases were created to test the assumptions mentioned above in addition to the performance of the suggestions to be used in the subject urban model, the main goal was to use available and affordable materials and techniques.

Previous studies proved that using night ventilation and avoiding day ventilation in hot arid climate will lower the inside temperature in the building during daytime in summer, and thus will lead to more energy saving for cooling purposes. So this study used the method of night ventilation whereby the infiltration rate where increased during night time and reduced during day time in summer.

Constant building materials, internal loads, u-values and surface properties for the buildings were used. Also, the climate data is constant for all the case to be inside the City of Amman.

The simulation was done for the 15 of July as the average day of the hot season, representing summer and the 15th of January as the average cold day representing the winter season.

6. Analysis

After conducting data entry of input data in the simulation software ENVI-met, results were compared for each case alone with the base case for both winter and summer seasons.

See figure 31 for the summer case results and figure 33 for the winter case results.

7. Results

From the temperature differences through all case all through the day and night, it was found that there is big variations in air temperatures within the city, both in summer and winter.

Summer case results:

It is found from graphs that light paving and shading with trees reduced the air temperature by 2 to 15 degrees in the middle of the street, which will contribute to outdoor thermal comfort, while the worst case scenario was the base case.

Winter case results:

North-South axis organisation of the street had the maximum temperature in the middle of the street in winter, while the shading of trees is excluded from the study cases because of the assumption of using deciduous trees.

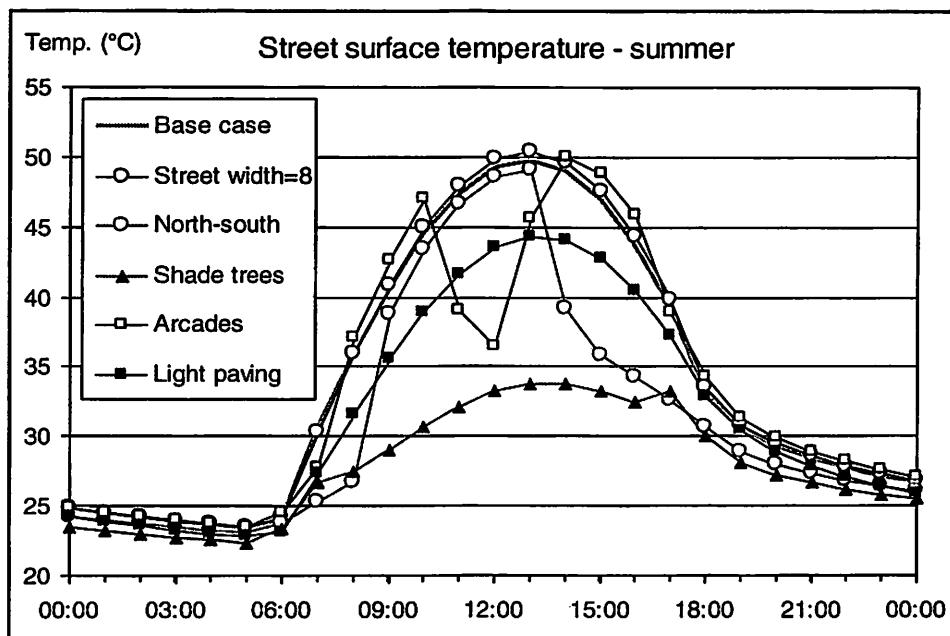


Figure 1: Street surface temperature, summer time, between all cases

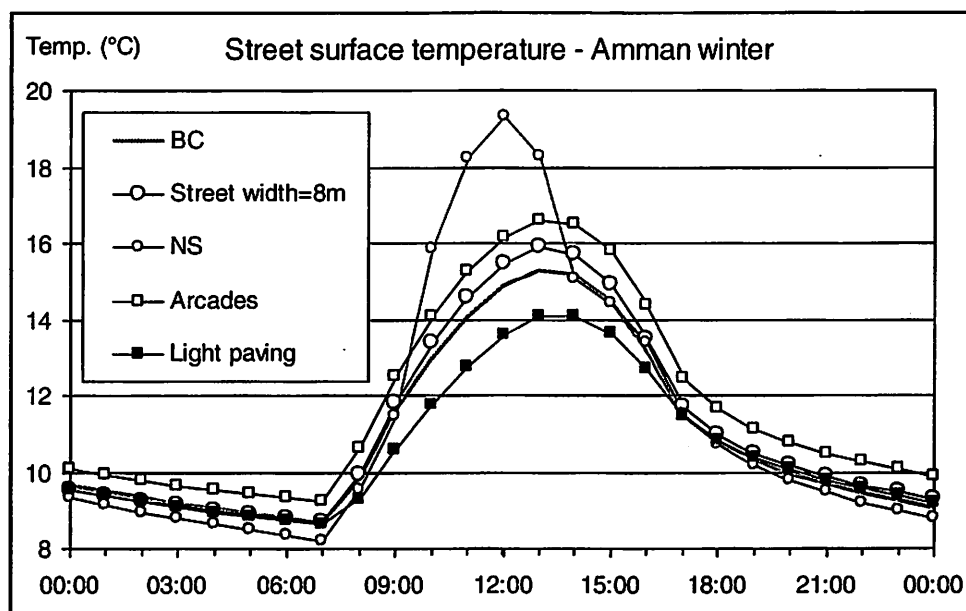


Figure 2: Street surface temperature- winter case, between all cases

CONCLUSIONS & RECOMMENDATIONS

After the analysis of the case study and literature reviews, a number of opportunities, conclusions and recommendations, the following attributes are recommended for the success of outdoor thermal comfort and urban heat island effect mitigation:

- Reducing the temperatures in street scale can contribute to decreasing urban heat island effect on a micro scale, and global warming on a macro scale.
- Taking into account the results of the study concerning the orientation of proposed pedestrian streets in Amman; it is objective to choose north-south axis paths for converting into pedestrian streets. On the other side, Rainbow Street in downtown Amman is an east-west Axis Street; but it is successful and comfortable to walk in. This can be for the narrowing of the street and variation in widths which may give it interest experience for the pedestrian and users of the street.

- Although Al-Wakalat Street in Sweifieh, Amman is a north- south axis road, it wasn't successful. This may be caused by the H/W ratio achieved in it with a value of 1, which means that the height of the buildings adjacent to the path is equal to the width of the path, which is negative for the outdoor thermal comfort.
- It may be a good idea to convert Al-Hamra Street in Sweifieh into a pedestrian path, although it will be wiser to take other elements into consideration when making this decision.
- It is recommended to choose locations of pedestrian streets to be enclosed between parallel strips of buildings that have good reflective materials on their facades so it doesn't absorb heat that gets emitted at night time which is the time that people use the pedestrian walks in summer.
- It is recommended to choose locations of pedestrian streets to be enclosed between parallel strips of buildings that have high H/W ratio that does not exceed a certain limit to avoid urban geometry effect in absorption and reflection, and benefit from the time of shading of the pedestrian street, which will keep the pavement surfaces from getting over heated.
- It is recommended that further simulations using ENVI-met software can be done on outdoor thermal comfort of streets between commercial tall buildings in order to decide H/W ratios, optimum orientation, and optimum shading techniques (using trees or shading devices) that can be positive for improving outdoor thermal comfort.
- It is recommended that further simulation using ENVI-met software can be done on further studies concerning vegetation type, height and location to conclude the optimum vegetation that can reduce heat and be cost effective.
- It is recommended that further simulation using ENVI-met software can be done on types of pavement material ranging from dark to light, soft to hard, smooth and rough, to measure the effect of them on reducing heat and choosing the optimum material.
- It is recommended in places where it is not possible for pedestrian walks creation, to design arcades in buildings. They are optimum solutions in commercial buildings, where we find no waste areas and no lose in investment and cost. On the contrary, this will increase revenues of commercial shops adjacent to the arcade where people are encouraged to walk because of the outdoor thermal comfort underneath the arcade. These are solutions for commercial areas.
- Distances can be narrowed between buildings in newly regulated plot of lands. This can encourage outdoor activities; at least for residents of buildings in their own backyards.
- In order to improve outdoor thermal comfort, there should be no front setbacks in order to achieve H/W proper ratio.
- Adequate planning and paying attention for outdoor thermal comfort by caring for pedestrian and outdoor activities can contribute to decreasing energy use and air pollution, and will mitigate urban heat island effects and dangers of global warming.
- It is encouraged to provide pathways and pedestrian walks with overhead shading to protect against solar radiation in summer by using shading devices, shading trees and canopies or arcades and galleries in commercial buildings.

REFERENCES:

- Akbari, H., D. Kurn, et al. (1997) *"Peak power and cooling energy savings of shade trees. Energy and Buildings"*,.
- Ali-Toudert, F., (2005) *"Dependence of Outdoor thermal comfort on street design in hot and dry climate"*, University of Freiburg, Germany,.
- Arthur H. Rosenfeld, Joseph J. Romm, Hashem Akbari, and Alan C. Lloyd, (2002) *"Painting the Town White -- and Green"*.

- B.C. Hedquist, A.J. Brazel, S. Di Sabatino, W. Carter¹, H.J.S. Fernando. (1991) "Phoenix Urban Heat Island Experiment: Microclimatological Aspects",
- Huang, J., H. Akbari, and H. Taha.(1990) "*The Wind-Shielding and Shading Effects of Trees on Residential Heating and Cooling Requirements.*" ASHRAE Winter Meeting, American Society of Heating, Refrigerating and Air-Conditioning Engineers. Atlanta, Georgia,.
- Jan Hafner & Stanley Q. Kidder (1998) "*Urban Heat Island Modeling in Conjunction with Satellite-Derived Surface/Soil Parameters*", Cooperative Institute for Research in the Atmosphere, Colorado State University, Colorado,.
- Johansson, Erik, (2005) "*Urban Design and Outdoor Thermal Comfort in Warm Climates*", Lund University.
- Jordan engineers association report, (2008)
- Lee, Eleanor, Selkowitz, Stephen, Bazjanac, Vladimir, Inkarojrit, Vorapat, Kohler, Christian, (2002) "High-performance commercial building facades".
- Morris, Jon, "*Determining the influences of wind and cloud on Melbourne's urban heat island*", (1991) School of Earth Sciences, The University of Melbourne, Victoria, Australia.
- NASA, (2002). "*Satellite confirms urban heat islands increase rainfall around cities*"
- Om, Hans, (2002) "*Urban Traffic and Transport*" Building Issues, Lund University.
- Peter Savio, (2006) "Mitigating New York City Sheat Island with Urban Forestry, Living Rooms, and light surfaces",
- S. Lindqvist and Jonsson, P. (2005) "*differences in urban heat island development between a coastal and an inland city in Africa*", submitted to international journal of climatology.
- Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller, (2007) "*Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*", Cambridge University Press.
- Swaid, H. And M.E, Hoffman,(1990) "*Prediction of urban air temperature variation using the analytical CTTC model*", Energy and buildings.
- Trenberth, K.E., P.D. Jones, P. Ambenje, R. Bojariu, D. Easterling, A. Klein Tank, D. Parker, F. Rahimzadeh, J.A. Renwick, M. Rusticucci, B. Soden and P. Zhai, (2007) "*Observations: Surface and Atmospheric Climate Change*", 2007.
- USGBC, "*LEED New Construction & Major Renovation, Reference Guide*", Third Edition,(2007).

LIVABLE PUBLIC OPEN SPACE FOR CITIZEN'S QUALITY OF LIFE IN MEDAN, INDONESIA

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ABSTRACT

The decreasing of public open space quality by the urbanization pressure has declined its function as a 'free' place for people to do various activities which contribute to their quality of life. Among the typical cities' problems in developing countries, such as the poor environment quality, the social gap which becomes wider, the increasing of the gated community and the privatized public spaces, and the public open space which becomes more denying among the other development's priority, the research means to identify how livable public open spaces are and how its livability relates to the quality of life. This study takes place in four active public open spaces in the center of Medan. By using a 1-5 Likert scale, respondents were asked about their level of satisfaction with the factors of public open space and physical quality of life. This research found that the public open space in Medan city is a livable place when it has a high level of usage, although the satisfaction level shows the grade between 3 (neutral) and 4 (satisfied). It means that the public open spaces do not fulfill people's preference ideally. The result of the study also indicates that the 'function/activity' aspect is the most significant factors in determining the people's perception of public open space, while the 'accessibility' is the lowest significant factor. This research found that the public open space relates to the quality of life via the satisfaction with health, recreation and urban environment.

Key Words: *livable public open space, quality of life, perception*

INTRODUCTION

The fast growing urbanization in most cities over the world gives impact to the changing of urban environment. Some of general problems in the urban area are the decreasing of environment quality, the weakness of social cohesion and the economic gap which becomes wider. The economic expansion has turned urban land into an economical asset, and, one of the impacts is the depressing of public open space quality. The condition becomes a serious problem while the public open space has an important role for people quality of life. Physically, public open space is a green space where trees and vegetation grow and maintain urban ecology. Many researches show that the natural element of open space generates relaxation, which has a relation with mental health (Abraham, Sommerhalder and Abel, 2010). The open space becomes a place to do sports and many other physical activities to

support physical health (Sugiyama, 2010; Franzini *et al*, 2009; Maller *et al*, 2009). In social aspect, public open space is a free access for people to enter in, to meet each other and to perform social interaction (Zhang, 2009). Public open space is a place to celebrate the cultural distinction (Thompson, 2002), so people could express their culture and tradition and discharging social boundary (Yeoh and Huang, 1998). The public open space could be a place for national events, community identity, and expressing an urban culture (Carr and Francis, 1992). The public open space also give a contribution to economic aspects while it could provide economic activities and enhance property's value (Irwin, 2002; Lutzenhisher and Netusil, 2001; Jim and Wendy, 2006, 2007).

There are several studies conducted to analyze the relationship between public open space and quality of life. Chiesura (2003) in Amsterdam found that public open space could affect quality of life through environmental, economic and social factors. Lynch (2007) in her study in Canada, stated that public open space influences quality of life through physical, social and psychological health, and also through economic and environmental quality. Commission for Architecture and Building Environment (CABE) Space in England argued that the relationship between public open space and quality of life is a complicated research to be held in national scale, but the smaller scale research has proofed that there is a correlation between the two (Beck, 2009).

With such important benefits to quality of life, now public open space in urban space over the world has to face some problems, such as the increasing of urban environments changing and the decreasing of public open space's function. Typical with the others, the cities in Indonesia are characterized by the fast growing shopping malls and gated communities which represent the middle up class' needs to a secure public space and global capital's movement (Dick and Remmer, 1998; Douglas, 2006). For example, in 2002, there were 20 malls built, although some of them were social-friendly, but only a little contributed to public space (Douglas, 2006). As a contrast, during this 30 years, public open space, especially green space, in Indonesian cities - such as Jakarta, Bandung, Medan, Surabaya and Semarang - tends to decline, from 35 % in 1970's to only less than 10 % in 2006 (Departemen Pekerjaan Umum, 2006).

Some of public open space problems in Indonesia are the privatization, commercialization and control of public open spaces. In some cases, the condition is supported by local government and causes the increasing of social segmentation and security problems, the rise of exclusive groups and many other social problems (Turner, 2002; Atkinson, 2003). The trend to dismiss the public open space and the increasing of gated community has been a conflict in harmonious social life to be "the end of public culture" (Sennet, 1977; 1995). The circumstance is contrast with the normative concept of public open space as a place for social interaction, cultural integration, democratic expression and political harmony in urban life (Carr, 1992). Generally, the urban space quality is not only indicated by physical function, but also by the meet of social, culture, psychology and ideology needs (Rapuano & Wigginton, 1994), as the important parts of quality of life (Massam, 2002, Das 2008).

The development is aimed to enhance and maintain the people's quality of life. In developing countries like Indonesia, where the planning and design of public open space does not have an important place among the development's priorities, it is critical to understand the people's perception about the place and whether it would relate to their quality of life. Thus, it would give contribution to development policy to reach the goal.

METHODOLOGY

Study located in Medan, the 3rd biggest city in Indonesia. The city of more than 2.5 million citizens had lack of public open space. There were just less than 5 % public open space with a low

quality. In the other side, malls, cafes and theme parks grew fast in this city, as well as gated communities. The research tried to investigate, among the problems, whether the public open space relate to the quality of life of citizens.

The survey was conducted in 2011. There were two types of data collected. The first, the physical and activity aspects of public open space, collected through the field survey and observation. The data gives information about the quality of public open space and how livable they are used. The second, the people's perception of public open space, collected through the interview based on questionnaire. The respondents were people which were doing their activities in public open space. They were chosen randomly in every activity zones in four active public open spaces in Medan. Respondents filled a set of questionnaire, guided by interviewer. The questionnaire consists of several sections as follows: (1) the respondents' profile; (2) the perception about the relationship between public open space and several quality of life factors; (3) the characteristic of activities done in the public open space (4) the level of satisfaction of physical, social and management factors of the public open space (5) the level of satisfaction with quality of life factors. The level of satisfaction of public open space is measured in a five-point Likert scale ranging from "1" for very unsatisfied, "2" for unsatisfied, "3" for neutral, "4" for satisfied and "5" for very satisfied. Using the mean values of the scale, "3" is considered to be the midpoint. Thus, any value above 3 is considered somewhat satisfied but of higher level. Similarly with any value below 3, it is considered to unsatisfied but of lower level. The analysis of the public open space' level of usage is supported by descriptive statistics analysis, to describe people's socio-economic background, duration, frequency and the variation of activities. To identify the dominant factors of public open space from people's perception, the central tendency test and factors analysis is used. Next, Spearman correlation is used to analyze the relationship between perception about public open space and the quality of life.

DISCUSSION AND FINDINGS

The Livability and People's Perception of Public Open Space

The successful and livability of public open space can be identified through two indicators, such as (1) users and (2) activity. From 'users' aspect, public open space was visited by all socio economic status, but dominated by the low income people (67.4%). Public open space was also visited by all age group, from kids to elderly, dominated by the teenagers (56.8 %).

In 'activity' aspect, it can be said that public open spaces in Medan were used optimally, both by the active and passive activities. There were a wide range of activities occur there, such as various sports, playing, picnicking, or just sitting and enjoying the environment. The most activities done were many kinds of sport, both in an organized or informal way, such as football, volley ball, gym and fitness, badminton, wall-climbing, jogging or just walking. The activities were supported by the public open spaces' facilities, although not always in a good quality.

The other indicator of the livability of public open space is the intensity of usage. Most people came to the public open space at least 1-4 times a month, while a part of them came more than once a week. People stayed in public open space for 1- 3 hours. Most of them came in the morning, between 05.00 to 10.00 am, and in the afternoon between 04.00 to 06.00 pm. Most people which doing their activities in public open space were those who spent their holiday and weekend in the public open space (53.9 %). The facts indicate that the public open spaces were active and livable. It means that they had a high level of usage, although not reach '24 hours usage a day' criteria.

There were several factors of public open space perceived by people, such as the accessibility,

facility, natural environment's elements, activity, management and the intensity of usage. The statistical analysis results show that, except the accessibility, all factors were significant in generating the perception about public open space (see Table 1)

Table 1. Factor analysis for the public open spaces factors

Factor name and items	Factor loadings	Eigenvalue	% Of variance	Cum %
Factor : public open space		9.647	6.398	75.24
Accessibility	0.33			
Facility	0.64			
Activity	0.67			
Management	0.58			
Natural environment	0.66			
Intensity	0.63			

Source : Data Analysis, 2012

The factor analysis shows that the 'activity' has the highest loading factors, when the 'accessibility' has the lowest one. The activity, as an important factor in perceived public open space confirm the other study, such as Gehl (1996) which said that the function and activity will attract people coming to public open space. Generally, the most activities done is the optional activities as classified by Gehl (1996). It means most people do the recreational activities, as a kind of activities which relate to the quality of public open space. The high quality public open space will attract people to come to public open space (Gehl, 1996). In Medan, the quality of public open spaces are not good enough compares to the nature of the successful public open space (Project for Public Space, 2000; CABE and DETR, 2001; Carr *et al*, 1992; Gehl, 1996) or to the people perception (see Table 2), which have not reach 4 (satisfied). But the people kept using them intensively and make them the livable public open spaces.

The finding of this research, that the accessibility is not significant in generating perceived public open space, is different with many studies which argued that the factor is a very important public open space factor (Project for Public Space, 2000; CABE Space, 2010). It can be said that people perceived 'accessibility' as 'how easy to reach a place by vehicle', because there is no good quality linkage or pedestrian in public open space, there is no integration with public transportation, too. But, people keep coming, and most of them (47.9 %) use their motor cycles.

Table 2. Satisfaction with Public Open Space's Factors

Number	Factor of POS	Mean Score
1	Accessibility	
	Distance	2.7
	How easy to enter in	2.82
	How easy to acces it from home	2.92
2	Facility	
	Dimension	3.05
	Parking lot	3.05
	Public toilet	3.06
	Playing area	3.15
	Sport area	3.23
	Sitting area	3.28

	Praying area	3.18
	Eating area	3.28
	Street vendor	3.27
3	Management	
	Safety	3.12
	Cleanliness	3.22
	Attractivity	3.30
	Orderliness	3.36
	Management	3.36
4	Natural elements	
	Trees	3.72
	Garden	3.53
5	Function/activity	
	Recreation	3.21
	Sport	3.23
	Social ineration	3.27
	Politic/democracy activity	3.23
6	Intensity	
	Duration	3.08
	Frequency	3.38
	Variation of Activity	3.52

Source: Data Analysis, 2012

People Perception with Quality Of Life Factors

Among many quality of life factors, some relate to people's activities in the public open space, such as the physical and psychological health (which relate to relaxation, recreation and social interaction) and the quality of urban environment - where public open space is one of the urban space elements (Sirgy and Cornwell, 2002; Salleh, 2008). Thus, the research analyzes the relationship between public open space and the three factors of quality of life, such as health, recreation and urban environment. This study found that, generally, almost people stated that they were satisfied with health, recreation and urban environment. But, it has to be highlighted that the majority of respondents were low income people. The people's subjective statements, which they were satisfied with their quality of life, show that there is a difference between the objective and subjective quality of life. The fact supports what Hoornweg *et al* (2007) argued that, in developing countries, people's wellbeing do not always fit with the objective condition of the economic environment, so that, the measuring of quality of life is lead to the subjective measurement which is based on the individual personal perception.

The Relationship between People's Perception with Public Open Space and the Quality Of Life

The quality of life in urban space is the outcome of the interaction between human and the urban environment. The satisfaction with public open space is one of the urban environment satisfaction indicators, so it relates to the level of satisfaction with the overall quality of life. The research builds a concept that people's perception of public open space has a relationship with quality of life via three factors: health, recreation and urban environment.

Public open space and health

The health benefit of public open space is delivered through the activities done in the public open space, as well as the existing of public open space physical elements. The public open spaces in

Medan are successful in accommodating many kinds of physical activity, such as various sports and play. The activities are perceived well by people with the mean score of the satisfaction level is between 'neutral' (score 3) and 'satisfied' (score 4)(see Table 2). Although the mean score did not reach 4 (satisfied), but the sum of people who said 'satisfied' (score 4) and 'very satisfied' (score 5) is larger than those who said 'unsatisfied' (score 2) or 'very unsatisfied' (score 1).

The research found that the most activities has been done in a group, both family or friends group. It means that there is a big opportunity for people to perform social contact. The research shows that generally people have perceived social activity well. Most people said that they ever engaged in a social interaction, such as saying hello to or making a conversation with the stranger or other people they met in the public open space. The fact indicates that public open space could have accommodated social interaction well. The met of this need would relate to the psychological health of people.

The health benefit is also given by the natural elements of public open space, such as trees, garden and vegetation. The livable public open space means that people keep coming to the public open space, so there is a big opportunity to them to contact with natural environment. This condition would give a restoration and relaxation effect (Kaplan and Kaplan 1989, 1990; Ulrich, 1979) which, afterward, would affect their mental and psychological health. The result of the study shows that majority of people (86.2 %) believed that public open space affect positively to their physical and psychological health. The fact is also supported by their level of satisfaction that most people stated 'neutral' (41.4 %) and 'satisfied' (38.7 %), with the percentage of these levels of satisfaction was larger than the 'unsatisfied' and 'very unsatisfied' level. It means that generally people were satisfied with their health, but have not reach an ideal condition yet.

Public open space and recreation

The met of recreation need is one of the quality of life indicators (Boyer and Savagean, 1981, 2000; Marlin, 1982). The level of people satisfaction with recreation activities in public open space shows mean score 3.21, or lower than 'satisfied' (mean score 4). But, the other sides, the public open spaces in Medan were active and livable. People have done many recreation activities, such as playing, picnicking, or just sitting. It means people have a big opportunity in gaining the benefits of recreation, such as a relaxation and restoration.

Public open space and urban environment

According to Das (20080), the quality of life in urban space is the outcome of the interaction between human and the urban environment. The public open space is one of the important urban environment elements. The study shows that, generally, the level of people satisfaction with urban environment is 'neutral' (44.3 %) and 'satisfied', with the percentage of these levels of satisfaction was larger than 'unsatisfied' and 'very unsatisfied' level. It means that generally people were satisfied with the urban environment, but have not reach an ideal condition yet.

Table 3. The Correlation Test Result between Quality Of Life and Public Open Space

<i>Descriptive Statistics</i>				
	Mean	Std. Deviation	N	
Quality of life	3.4080	.65675	384	
Public Open Space	3.2649	.51527	384	

<i>Correlations</i>				
	Quality Of Life	Public Open Space		
Spearman's rho	Correlation Coefficient	1.000	.231	
	Sig. (2-tailed)	.	.000	

		N	384	384
	Public Open Space	Correlation Coefficient	.231	1.000
		Sig. (2-tailed)	.000	.
		N	384	384

** Correlation is significant at the .01 level (2-tailed).

Table 3 shows the result of the correlation test between public open space and the quality of life. According to the table, it can be seen that the correlation coefficient between public open space and the quality of life is 0.231 or 23.1 %. It means public open space can explain quality of life as high as 23.1 %, and the rest explained by the other factors. It is because the quality of life factors of the study only those that relate to the activities in public open space, meanwhile there are many others quality of life factors. The positive direction of the relationship indicates that the increasing of satisfaction with the public open space will increase the satisfaction with the quality of life.

CONCLUSION

However, the quality of life is a complex concept, when there are so many factors relate to it. The research confirms many earlier studies that the livable public open space has a strong relationship with the citizen's quality of life, such as studies conducted by Quintas and Curado (2009), CABA Space (2010) and Lynch (2007). But it has to be understood that people have to face the changing of the lifestyle (Siu, 2008), the community and the way of recreation (Freestone and Nichols, 2004). The fact shows that the public open space has to compete with the higher quality privatized public space. The study found that physical factors of public open space have a strong correlation with the public open space perception. Thus, the enhancement of the public open space factors will make a better perception of public open space and then to the quality of life. The urban planning policy has to place the public open as one of the development priorities, because of the important contribution to the urban quality of life.

REFERENCES

- Abraham, Andrea; (2010) Sommerhalder, Kathrin; Abel, Thomas (2010) Landscape and Well-being: A Scoping Study on The health-promoting Impact of Outdoor Environments, Int.J. Public Health 55: 59-69
- Atkinson, Rowland (2003) Domestication by Cappucino or A Revenge on Urban Space Control and Empowerment in the Management of Public Space. Urban Studies, Vol. 40, No. 9, 1829-1843
- Beck, Helen (2009) Linking the Quality of Public Space to Quality of Life, Journal of Place Management and Development Vol. 2 No. 3, Emerald Group Publishing Limited
- Boyer, R., Savageau, D.(1981, 2000). Places Rated Almanac. Rand McNally, New York
- Carr, S, Francis, M. Rivlin, L.g., and Stone, A.M. (1992) Public Space, Cambridge: Cambridge University Press
- CABA and DETR (2001) The Value of Urban Design, London: Thomas Telford
- CABA Space (2010), Community Green: Using Local Spaces to Tackle Inequality and Improve Health.
- Chiesura, Anna (2004) The Role of Urban Parks for The Sustainable City, Landscape and Urban Planning, 68 (2004) 129–138
- Das, Daisy (2008) Urban Quality of Life: A Case Study of Guwahati, Springer Science+Business Media B.V. ,Soc Indic Res (2008) 88:297–310
- Departemen Pekerjaan Umum Republik Indonesia (2006) Metropolitan Indonesia: Kenyataan dan

- Tantangan dalam Penataan Ruang, Jakarta : Direktorat Jendral Penataan Ruang
- Dick, H.W, P.J. Rimmer (1998) *Beyond The Third World City : The New Urban Geography of South East Asia*, Urban Studies, Edinburgh, Dec 1998, Vol.35 Iss.12 pg 2303
- Douglas, Mike (2006) *Local City, Capital City or World City? Civil Society, The Post Development State and The Globalization of Urban Space in Pacific Asia*, Pacific Affairs, Vancouver : Winter 2005/2006, Vol. 78 Iss.4 pg 543
- Francis, Mark (1997) A Case Method For Landscape Architecture. Landscape Architecture Foundation, New York
- Franzini, L. Et al (2009) Influences of Physical and Social Neighbourhood Environments on Children's Physical Activity and Obesity. American Journal of Public Health, Vol 99 no.2
- Freestone, Robert, Nichols David (2004) Realising New Leisure Opportunities for Old Urban Parks: The Internal Reserve in Australia. Landscape and Urban Planning 68 109–120
- Gehl, Jan (1987) *Life Between Buildings*, Van Nostrand Reinhold, New York
- Gehl, Jan; Gemzoe, Lars (1996) Public Space – Public Life. The Danish Architectural Press and Royal Danish Academy of Fine Arts School of Architecture Publishers. Copenhagen
- Gehl, Jan. (2002) Public Space and Public Life City of Adelaide: 2002. City of Adelaide, Adelaide.
- Irwin, E., G. (2002) The Effects of Open Space on Residential Property Values. Land Economics.78: 465-480.
- Jim, C.Y. and Chen,W. Y. (2006a) Recreation–amenity Use and Contingent Valuation of Urban Greenspaces in Guangzhou, China, Landscape and Urban Planning 75: 81–96.
- Jim, C.Y. and Chen, W.Y. (2006b) Impacts of Urban Environmental Elements on Residential Housing Prices in Guangzhou (China), Landscape and Urban Planning 78: 422-434.
- Jim, C.Y. and Chen, W.Y. (2007) Consumption Preferences and Environmental Externalities: A Hedonic Analysis of the Housing Market in *Guangzhou*, Geoforum 38: 414–431.
- Kaplan R, Kaplan S. (1989) The Experience of Nature: A Psychological Perspective. New York: Cambridge University Press, 1989.
- Lutzenhisher, M. and Netusil N., A. (2001) The Effect of Open Spaces on a Home's Sale Price. Contemporary Economic Policy 19: 291-298
- Maller, Cecily *et al* (2009) Healthy Parks, Healthy People: The Health Benefits of Contact with Nature in a Park Context, George Wright Forum Volume 26 Number 2 (2009)
- Lynch, Karen (2007) *Neighbourhood Parks In Saskatoon: Contributions To Perceptions Of Quality Of Life*, Thesis, Department Of Geography, University Of Saskatchewan, Saskatoon, Saskatchewan, Canada
- Marlin, J.T.(1992) The Livable Cities Almanac. Harper Collins, New York.
- Massam, Bryan H. (2002) Quality of Life : Public Planning and Private Living. Progress in Planning 58, 141-227
- Project for Public Spaces, Inc (1984) Managing Downtown Public Spaces, Planners Press, Chicago
- Project for Public Spaces (2000) How to Turn a Place Around: A Handbook of Creating Successful Public Spaces, New York: Project For Public Space
- Quintas, Andreia V., Curado, Maria Jose (2009), The Contribution of Urban Green Areas to The Quality of Life, www.cityfutures2009.com
- Rapuano, M., Pirone, P. P., &Wigginton, B. E. (1994) Open Space in Urban Design: A report (Revised ed.), Cleveland, OH: Cleveland Development
- Salleh, A. Ghani. (2008). Neighbourhood Factors in Private Low-cost Housing in Malaysia. Habitat

- International 32 (2008) 485–493
- Sennett, Richard (1977) The Fall of Public Man, New York: Knopf, 1977
- Sennett, Richard (1995) Bodily Experience in Public Space. In : Edgell, S., Walklate S., ; William, G (Eds), Debating The Future of Public Space : Transforming the Public and Private Domains in Free Market Societies. Ashgate, Avebury, pp 165-175
- Sirgy, M.J. and T. Cornwell (2002) How Neighbourhood Features Affect Quality of Life, Social Indicators Research, 59, 79-114.
- Siu, Kin Wai Michael (2008) Public Design for Changing Urban Needs, The Hong Kong Polytechnic University, Hong Kong SAR, China,
- Sugiyama, Takemi; Francis, Jacinta; Middleton, Nicholas J.; Owen, Neville, Giles-Corti, Billie (2010) Association Between Recreational Walking and Attractiveness, Size and Proximity of Neighborhood Open Spaces, American Journal of Public Health, vol.100 no. 9, p 1752 – 1757
- Thompson, Catharine Ward (2002) Urban Open Space in The 21st Century, Landscape and Urban Planning 60 (2002) 59–72
- Turner, R.S. (2002) The Politics of Design and Development in The Postmodern Downtown, J.Urban Affair, 24, 533-548
- Ulrich R.S. (1979) Visual landscapes and Psychological Wellbeing, Landscape Res., 4: 17-23.
- Yeoh, Brenda S.A; Huang, Shirlena (1998) Negotiating Public Space: Strategies and Styles of Migrant Female Domestic Workers in Singapore, Urban Studies, Vol.35, No. 3, 583-602
- Zhang, Wei; Lawson, Gillian (2009) Meeting and Greeting: Activities in Public Outdoor Spaces Outside High Density Urban Residential Communities, Urban Design International, vol 14, 4, 207-214

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LIVEABLE EXTENDED URBAN SPACES THROUGH RURAL TOURISM SUSTAINABLE CONCEPT, A CASE STUDY OF YOGYAKARTA, INDONESIA

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ABSTRACT

The globalization and rapid urbanization become the two processes which continue to influence the development of the city particularly in developing countries. The three zones of urban form -a city core, a peri-urban region and extended urban form- have changed rapidly through urbanization forced by technology, communication, and globalization. The policy of making better place in the middle of change sometimes ignores those three zones as a whole for the sake of priority. The city core is the first priority while the extended urban form is the last. This article answers the Mc Gee's challenge to understand the reconfiguration of extended urban space in order to build livable cities in Asia.

Three rural tourism cases in Yogyakarta, Indonesia are studied through interviews with key person and observation, and analyzed to look at the sustainable concept of rural tourism. By examining descriptive concepts in three case studies, a framework for sustainable rural tourism is built to understand livable extended urban spaces and the relationships between the three zones of urban form.

Key Words: *rural tourism, extended urban space, sustainable concept.*

INTRODUCTION

Urbanization can be defined as the rapid and massive growth of, and migration to, large cities or could be understood as the percentage of the urban population. Urbanization is the process where an increasing percentage of a population lives in cities and suburbs. But urbanization could be also defined as the process of being cities (Soetomo, 2009). This process is often linked to industrialization and modernization, as large numbers of people leave farms to work and live in cities and as large number of rural area becoming part of the city. Those issues have the same impact on the rural area, which is the the decreasing of agricultural productivity, since there is a small number of people who work for the agricultural and more agricultural land have been transformed to be urban housing estates. It comes to the issues of urbanization.

Urbanization is influenced by three factors: the natural population growth of urban areas, migration from rural areas to urban areas, and the reclassification of rural villages into urban villages.

The measurement of urbanization itself is used to be focused on the administrative definitions, but in reality it happens outwards the urban cores boundaries into surrounding areas. It is caused by the faster urbanization and forces of change (globalization, technology, and communications) (see Marcotullio et.al, 2003) especially in developing countries. And Mc Gee (2010) arguing that those phenomenon accelerate the spatial configuration of Asian Cities into three spatial elements of urban form: a) a city core(s), b) a peri-urban region, and c) an extended urban region. A city core is the core areas of the city which is characterized by the build-up area. A Peri-urban region is an extensions build-up area of the city as a suburbs. And an extended urban region is an area of diffusing urbanization that extended for up to 100 kilometers and often penetrate the agricultural areas (rural areas) in Asian context. And those rural-urban linkage are a major importance in the flows of food, commodities, people and environmental quality. This raises issues that to improve the urban life quality, it should be based on the understanding of those spatial configuration.

It is Mc Gee who has an idea to combine the “developmentalist” and “livability” vision to be prevailed in urbanization era of Asia. It means that improving the material condition of the cities should be balanced with making cities greener and sustainable. To make it possible there should be focused on extended urban space or “desakota” (Indonesian word means ‘village’ and ‘town’ to describe the mixture of rural and urban activities in the area). Those areas have strategic position to supply the food, fresh air, and water as an important element to create livable cities. And as his recommendation to develop the local context of “sustainable cities”, this study is focusing on local sustainable concept to answers the Mc Gee’s challenge to understand the reconfiguration of extended urban space in order to build the livable cities in Asia.

In a recent decade, there is a rapid growth of international tourism which causes the awareness of many policy makers and local leaders in developing countries to the importance of rural tourism (Nasikun, 1997). Top tourism destinations include national parks, wilderness areas, mountains, lakes, and cultural sites, most of which are generally rural in an extended urban region. Thus tourism is already an important feature of the rural development in these specific sites.

Rural tourism emerges as a green-coated reincarnation of the urban consumption paradigm (Hwang, 2012, Liu, 2006). Various attempts were made by rural inhabitants in order to maintain its authenticity environment as natural as possible to offer to tourists. Rural areas was preserved as agricultural activities or even developed. This phenomenon shows a strong environment control to maintain the rural area from the influence of modernization spatially and visually. These actions tend to make rural area in extended urban region livable.

To answers the Mc Gee’s challenge of understanding the reconfiguration of extended urban space in order to build livable cities in Asia., the study has been done in Indonesia because of its urbanization level. Asia, which is 66 per cent of the world population, reaches 36 per cent urbanization in 2007 and is estimated 80 per cent of all global urban population for the next five decades (Mc Gee, 2010). Indonesia, the level of urbanization is projected to reach 68 per cent by 2025. For some provinces, especially provinces in Java and Bali, the level of urbanization is higher than Indonesia in total. Urbanization level in four provinces in Java in 2025 was above 80 per cent, which is in DKI Jakarta, West Java, Yogyakarta and Banten. Table 1 presents the urbanization rate by province in Java, Sumatra, Bali and Papua from 2000 to 2025.

Table 1. Percentage of Urban Population in Sumatra, Jawa, Bali, Papua Indonesia by Province, 2000-2025

Province	2000	2005	2010	2015	2020	2025
DKI JAKARTA	100.0	100.0	100.0	100.0	100.0	100.0
JAWA BARAT	50.3	58.8	66.2	72.4	77.4	81.4
JAWA TENGAH	40.4	48.6	56.2	63.1	68.9	73.8
DI YOGYAKARTA	57.6	64.3	70.2	75.2	79.3	82.8

JAWA TIMUR	40.9	48.9	56.5	63.1	68.9	73.7
BANTEN	52.2	60.2	67.2	73.0	77.7	81.5
BALI	49.7	57.7	64.7	70.7	75.6	79.6

Source: Indonesia Statistic, 2013.

METHOD

This study is taken in Daerah Istimewa Yogyakarta Province (called Yogyakarta), which is the second highest of urbanization in Indonesia after Jakarta. Yogyakarta is well-known as the cultural city, the center of Javanese Culture. The city was chosen because of the tradition of Javanese people that emphasizes environmental sustainability called “Memayu Hayuning Bawana” (Javanese means safety and earth, representing the environmental conservation) (Anshoriy, Sudarsono, 2007). This city represents the local context in developing the concept of livability in traditional milieu. Compared to the modern planning theory, the validity of traditional context is often questionable, but the traditional context is superior in terms of encouraging public participation (Samanpour, 2012).

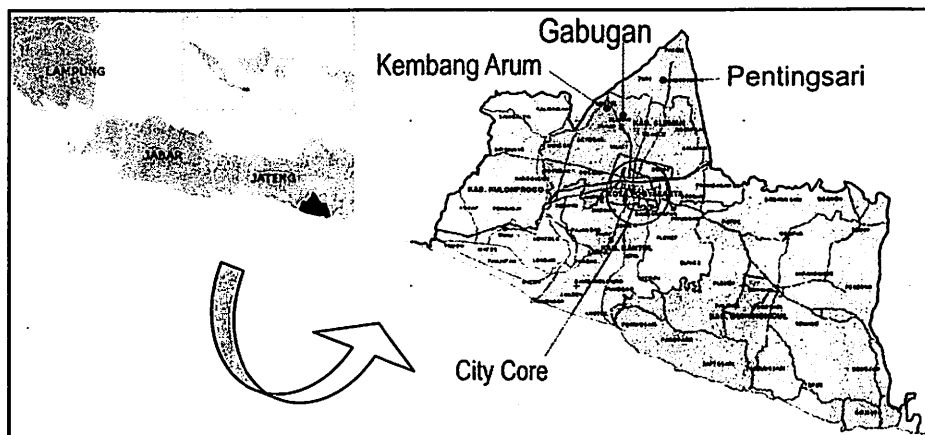


Figure 1. Map of Yogyakarta and the location of cases

The combination of the “developmentalist” and “livability” vision can be found in the rural tourism practice. The rural tourism is a driving force to make their place more competitive and more efficient “engines of growth”. There is improving the material conditions of the place. This phenomenon is in line with the developmentalist vision. In the other hand the development encourages the environment greener and liveable, since that is precisely the place as a tourist attraction to be offered. And this is what the livability vision arguing to make better place by people empowering ideas of neighborhood, the importance of heritage, culture and the conservation of the natural environment. So it is interesting to explore how it works, what is the concept of making the extended urban space livable through rural tourism.

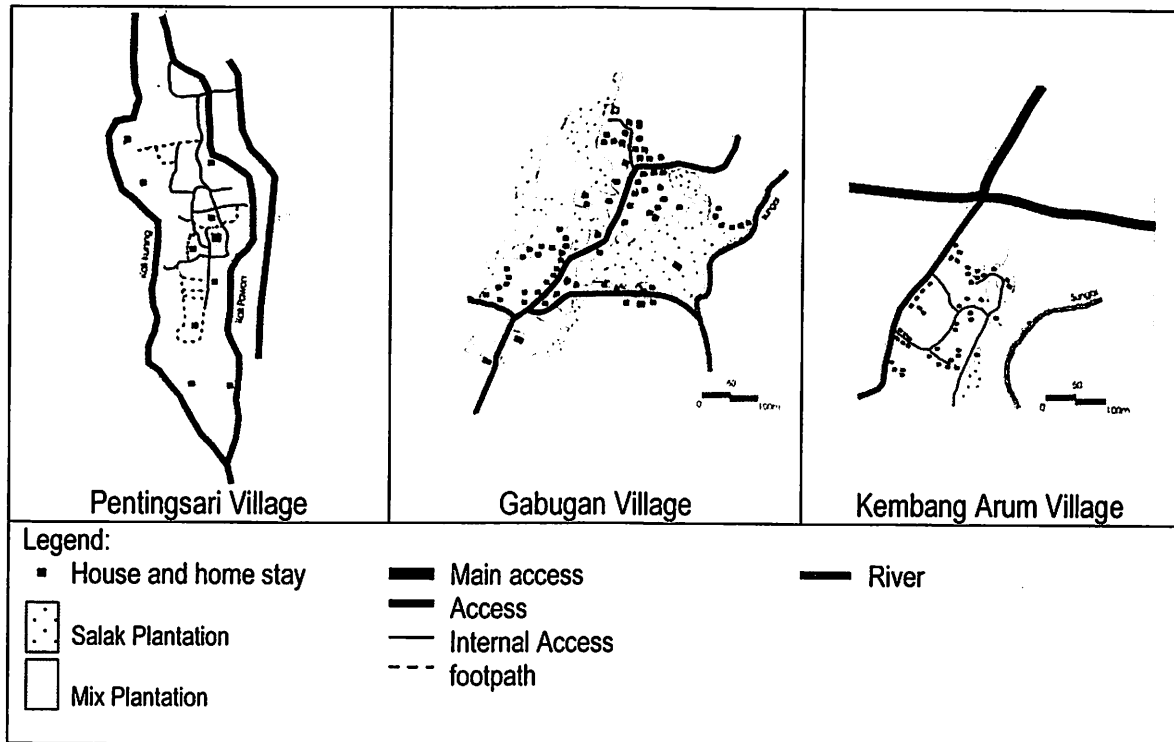


Figure 2. Characteristic of the Tree Rural Tourism Cases

Source: Pudianti 2012

Tree cases of rural tourism in Yogyakarta are studied to represent the variation of the cases, because there are forty rural tourisms mostly in northern of Yogyakarta for the last ten years with different potential resources (Dinas Pariwisata Sleman Yogyakarta, 2012). The first case is in isolated location of Pentingsari Village with limited access to the village, where the main attraction is on natural green village and local cultural heritage. The second is in open access location of Gabugan Village with the simple rural life but far from main access. And the third is in open access and near the main access location of Kembang Arum Village, where the attraction of rural life is combined with the cushioned home stay of resort facility standard.

The interview approach was developed to explore the argument of willing to transform their village as tourist destination. The informants of each community were identified on referral basis or as so called snowball sampling technique (Neuman, 1997). They are mainly a key person in community who know the community well and care about the future growth and development.

The thematic categories were used to synthesize similar ideas and concepts. After categorization of the data, new thematic categories were added in cases where important data did not fit into these categories.

FINDINGS AND DISCUSSION

Phases of Collective Action to be Rural Tourism

In all three communities, the partnerships currently establish between local community residents and outside organizations advocating tourism but all began with initial resistance from residents. The resistance was a general pattern behavior of the elders who are concerned about the negative effect of changes to the local culture. In all cases, community members were success at establishing an effective dialogue among them and agreed to be the tourism place as long as being managed by the community itself even though there was an outside forces advocating tourism.

In two cases, outside tourism developers proposed some kind of tourism development that was

framed as a threat by the community and led to information sharing among residents. And in one case the community leaders proposed their idea after studying from other experience of rural tourism and also led to information sharing among residents. Sharing information of the threat of proposed tourism was result of village meetings held by community leaders. In each community, the purposes of the meeting were to discuss the proposed tourism development and identify impacts that would threaten some desirable aspect of community life.

After the tourism development has been held for several years, all of the three cases have an outstanding progress as evidenced by the number of tourists on a regular basis, but in three different qualities. First case achieves the best of national rural tourism in 2009 of Indonesia and also awarded as "conservation of nature and culture" in 2011 from United Nation. The second case preserves their rural live uniqueness through their traditional belief of sustainability. The third case achieves the best of rural tourism 2008 in Indonesia, but for the last two years has been influenced by the outside organizations, part of the rural village has not been owned by the resident and developed like a resort standard quality in a rural style. However the urbanization ratio decreases in all of three cases after the rural tourism practice.

Collective Action to Live and Work in Extended Urban Space

In all three cases more than fifty percent of the population has a job in the civil service and the private sector outside their village. Young people are also more interested in being a formal employee rather than remain in their villages and cultivate crops. Most of them choose to stay near their workplace, but some others still stay in the village harvesting their crops as an additional income. Almost all the residents who left the village still owns the land inherited from their parents. Their family member or farm worker cultivates it in a cooperative system. It means that although they urbanize to the city, but attachment to his birthplace still tight

After their village being a rural tourism, many of them (both those who have retired or still active) come back with all of family member, and then live, cultivate crops, participated in the development of rural tourism and make their agricultural way of life as the tourist attractiveness. The rising generation are playing the important role in a tourism programs. Many of them are a high school or college student commuting to the peri-urban or in the city core. So it is obvious that a high attachment to his homeland keeps them living comfortable (Altman and Chemers, 1980, Tognoli, 1987).

Attachment to place has been much discussed by environmental psychology expert, but how this attachment could reduce urbanization has not been much discussed. Attachment to place can be caused by a very strong relationship in the neighborhood or strong social relation with friends and neighbors, this kind of relationship can be found in slums area. Attachment to place could be reflected as emotional feelings among friends in a very poor condition, sentimental memories and other cognitive interpretation on a very meaningful experience of life in that place. City as a new place for their living is a strange place that creates a feeling of anxiety that ties to his old homeland. The higher forced to be urbanized they do the higher attachment to their old places. Therefore coming back to the extended urban spaces will be the first choice if this place gives residents an opportunity to improve their lives. The attractiveness of income generation from rural tourism might reduce the ratio of urbanization, especially in the extended urban space.

In all three cases, the attachment to the place could be observed easily. The residents coming back from the city core of Yogyakarta or from other city, or the elders said it explicitly, almost all of the peoples interviewed said that they always remember their homeland when they are far from home and also feel there is no other place like their village. That is the main reason why people still maintain their house to stay during holiday or at least keep the inner relationship with their homeland through the land owned and still continues to manage the production of crops. In one case the attachment to the place is interpreted more strongly with their pride of the place because of the attraction of the nature. The attraction is most reflected from the United Nation award of "Conservation of Nature and Culture". The

pride of their village keeps residents to stay in the village. In other case, the meaning of attachment to place is influenced by strong emotional relationship with the ancestor who emphasizes Javanese belief to preserve ancestral lands. So it is proved that physical and social factors are correlated in determining attachment to place, but there are some differences of each culture (Tognoli, 1987, Pudianti, 2013).

Collective Action to Preserve Their Homeland

Land is a very precious inheritance and sold very easily when people need cash. It is common in Indonesia especially in the rural area to sell their land in order to provide funds for important occasion such as daughter's and son's wedding ceremony, higher education and any other social ceremonies. Land in the extended urban space is an attractive new target for residential area. Even more the city core and peri-urban space has become less comfortable because of its density, noise, traffic congestion, air and water pollution and so on. In fact the urban residents began to demand an alternative for a comfortable place to stay.

Extended urban space in Yogyakarta has an important role as the main urban water resource, and it has been protected with the city regulation. The investor can't propose the residential estate permit in this location. But there is a tendency to buy the land as the individual lot. After changing the land tenure, development of the area is difficult to be controlled. Step by step land of agriculture changes into non agriculture such as residential or small scale industry and all of them without a building permit processing.

One of the cases studied has the unique and simple concept of protecting the land tenure. There is collective action to preserve their homeland through the Javanese belief that land can never own by people. Only The Creator owns the land, people can only work on it and take the advantage from its product. The system to preserve is arranged by local informal agreement to provide land inheritance among the family member and is not allowed to sell it. If one intends to sell it, he/she will lose his/her right, but he could transfer their right only to other family member who lives in the village by getting some compensation. The system could protect land tenure from outsiders. The land is still a productive agricultural land. This quality of life seems to be vital for reinvention of local qualities free of the dominance of global norms.

Being the rural tourism the opportunity of life is better, the resident could have agricultural and non agricultural activities in a time, the mixture of rural and urban activities. When many environmental and economic challenges as urban activities expand, it could be the opportunity of the village to be the food provision for the city core and in the other hand to be a tourism destination. It offers many opportunities to be livability and sustainability visions of the city regions from the city core, peri-urban and extended urban space. The concept of rural tourism sustainability learnt from the extended urban space has to be modify as a model of preserving the agricultural regions that can be applied in a wide range.

Conceptual Model of Liveable Extended Urban Space

These findings lead to a conceptual framework (see Figure 3) on rural tourism sustainability as a catalyst to explore the liveable of extended urban space.

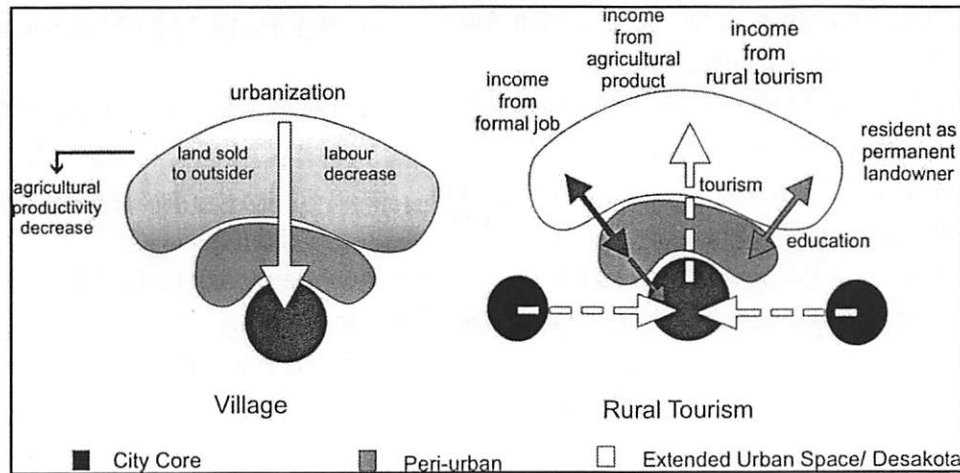


Figure 3. Conceptual Framework for Liveable Extended Urban Space

Before becoming rural tourism, there was a migration of the resident into the city. After the labor decreased, it followed by lending the land and/or selling it. It caused reducing of agricultural productivity, and also urbanized the extended urban space. Learning from the rural tourism in Yogyakarta, the livable urban extended space could be saved by generating residents' income and the most important is protecting the local land tenure. Rural land should be owned by resident who will continue to cultivate the crops. The main idea of making extended urban space livable is keeping the land tenure remains in the hands of the local residents of the rural tourism, because they have deep attachment of the place and they will protect their belonging as long as they feel a better life.

CONCLUSION

The purpose of this study was to explore the local conceptual livable extended urban space as an alternative way to answer the Mc Gee's challenge. As he said that "desakota" (extended urban space) region need to be focused on establishing the knowledge of sustainable urban development trajectories.

As a practical implication for community planners, the conceptual framework has to be modified in many different cases. As research implications, this study creates a contextual model of Javanese sustainable concept. Future research should be conducted to other cultural background to test whether the model fit to any various conditions and the limitation of it.

The findings suggest that the efforts to protect extended urban space come from the local simple idea of keeping the land tenure remains in the hands of the local residents of the rural tourism, because they have deep attachment of the place.

REFERENCES

- Altman, Irwin and Chemers, Martin M. (1980). *Culture and Environment*. Monterey, CA: Brooks/Cole Publishing Company.
- Anshoriy Ch HM Nasruddin, Sudarsono, SH. (2008). *Kearifan Lingkungan: Dalam Perspektif Budaya Jawa*. Jakarta: Yayasan Obor Indonesia.
- Dinas Kebudayaan dan Pariwisata, Kabupaten Sleman, (2012), *Profil Desa Wisata di Kabupaten Sleman*, unpublished Governmental Report.
- Hwang, D., Stewart, W.P., Ko, D. (2012). Behaviour and Sustainable Rural Tourism Development. *Journal of Travel Research*, 51 (3), pp 328-341, Sage Publications, journal online.

- Liu, A. (2006). Tourism in Rural Areas: Kedah, Malaysia, Journal Tourism Management 27 (2006) pp. 878-889, Journal online Elsevier
- Mc Gee, T.G. (2010) Building Liveable Cities in Asia in the Twenty-First Century Research and Policy Challenges for the Urban Future of Asia. Malaysian Journal of Environmental Management 11(1) (2010). (online) Retrieved March 11, 2013, from http://www.myjournal.my/public/issue-view.php?id=1114&journal_id=176
- Nasikun. (1997). Modeling Rural Tourism for Sustainable Rural Development. In John Minnery, Myra P Gunawan, Michael Fagence, Darryl Low Choy (eds). Proceedings on the Training and Workshop on Planning sustainable Tourism, Penerbit ITB, Bandung.
- Neuman, W Lawrence. (1997). Sosial Research Methods: Qualitative and Quantitative Approaches. Boston: Allyn & Bacon.
- Maccotullio, P.J. and Lee, Y.S.F. (2003). Environmental Transitions and Urban Transportation Systems: A Comparison of the North American and Asian Experiences". International Development Planning Review. 25 (4). Pp. 325-354
- Okech, R., Haghiri M., & George B.P.(2012). Rural tourism as a sustainable Development Alternative: An Analysis with Special Reference to Luanda, Kenya, Cultur, No 06 - n° 03 - Agust/2012. Pp. 36-54 from www.uesc.br/revistas/culturaeturismo
- Pudianti, A. (2012). Perpaduan Budaya Lokal dan Potensi Fisik Sebagai Daya Tarik Wisata Pedesaan di Sleman, Daerah Istimewa Yogyakarta. Unpublished Research Report of Doctoral Study Program of The Architecture and Urban, University of Diponegoro Semarang, Indonesia.
- Pudianti, A. (2013, February 28). Budaya Sebagai Dasar Konsep Lingkungan Berkelanjutan Pada Desa Wisata Pentingsari, Sleman DIY . Paper presented in National Seminar on Sustainable Urbanism 2nd : Cultural, Social and Technological Approach. University of Diponegoro Semarang.
- Samanpour, F. (2012). Enhancing Quality of Traditional Built Environment: Towards a Convenient Model of Decision Making in Traditional Milieu. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies Vol. 3 No. 3, pp. 227-244. (online) Retrieved May 17, 2013, from <https://sites.google.com/site/itjemas/>
- Soetomo, S, (2009), Urbanisasi dan Morfologi, Yogyakarta: Graha Ilmu.
- Tognoli, . (1987). Handbook of Environmental Psychology (Daniel Stokols & Irwin Altman eds., 1987). New York: John Wiley & Sons

THE COMPANY TOWNS' CULTURAL HERITAGE AS A SUBJECT OF COMPARATIVE ANALYSIS: PARTICIPATION INCLUDING PEOPLE

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ABSTRACT

The study exposes a multidisciplinary urban planning research on the theme of Company Towns that involves participation with a core network (World Wide Web) in order to disseminate results, and to systematize the contents in terms of database this structured online. The main goal is to enable research platform that allows participation in urban planning process to discussions of related issues, particularly the protection of the memory and cultural heritage. Through a website and a network of social medias the possibility to increase the community participation in order to disseminate results, and to systematize the contents in terms of bank data, all of this structured online. The study was developed as a function of community demands related urban problems in particular about the cultural references, linked to the industrial heritage, of small and medium towns. The work involved approaches with work field, interviews and workshops with communities where current problems are discussed and also reviewed the history of the cities. These approaches intends to prepare communities in sense of a sustainable urban planning to enable a qualified prospect for future generations. In this process the theories of architecture and urban planning are somehow translated to allow understanding by communities. The first results have revealed that the participatory process strengthens the sense of cooperation and criticism on public policies. These results were significant because the possibility of integrating the site with other media publication and blog sites as virtual relationships become the best documented and participatory activities. In this sense, what is expected with <http://www.ufjf.br/urbanismomg> site is to provide a dialogue between University and communities about theories of architecture and urban planning. The site also lies in the facebook pages on <http://www.facebook.com/pages/urbanismomg/208071325885839?sk=info>, updated daily with information addressing the research. The work is supported by CAPES, CNPq, Ministerio das Cidades, Ministerio da Cultura and FAPEMIG.

Key Words: *urban planning, sustainable, participation.*

INTRODUCTION

The understanding of the urban problems cannot be freed of an analysis on the specificities of the urban and agricultural occupations. In Brazil, the challenges for the municipal public administration are numerous, considering the problems that accumulate in the day-to-day cities. When we think of the need to control land use, many fronts open and the trend is common to seek to resolve the immediate, or even what meets certain privileged group. Rooted political disputes are interposed, as a true "stage" for conflicts of interest. And these disputes, in most cases, leave the collective interests, ie the common itself, in the background.

The work exposes here is part of the activities of the research group "Urbanismo em Minas Gerais" at the Federal University of Minas Gerais with emphasis on a historical perspective on the

issues of urban planning, architecture and urban design. The activities involved approaches on communities, with work field, interviews and workshops where current problems are discussed and also reviewed the history of the cities. These approaches intends to prepare communities in sense of a sustainable urban planning to enable a qualified prospect for the future generations. The paper is linked to a continuing research in Minas Gerais with emphasis on the history of planning. The intention of this studies is to expanding references in terms of urban planning thoughts and practices, in addition to thinking about currently city planning proposals. The comparatives approaches is placed on this path both in terms of urban planning thoughts and city planning practices.

In Minas Gerais, Brazil, numerous cities accumulate urban problems in terms of sanitation infrastructure, education, health, leisure and housing, among others. Since 1988, with the Federal Constitution were articulated new management tools and different methodological approaches. On July 10, 2001 federal law number 10.257 recommended the elaboration of master plans with participation. Considering these prerogatives the actions of the research group turn to the demands placed by municipalities. The communitary participation has been encouraged on discussing urban planning problems, with particular comprehension to the issue of cultural heritage related to the company towns. In this way it must be consider the necessity to protect the cultural references that distinguish and enable cultural identity of the cities.



Figure 1 – The State of Minas Gerais in Brazil and its planning regions. Source : Urbanismomg/UFJF.

The strategy to encourage the participation, as the main goal of this study, is to enable research platform that allows this participation in urban planning process to discussions of related issues, particularly the protection of the memory and cultural heritage. Through a website and a network of social medias the possibility to increase the community participation in order to disseminate results, and to systematize the contents in terms of bank data, all of this structured online. Therefore, the virtual page intends to promote and deepen the studies quickly and interactively. These findings emphasize the need for the presence of any person or institution in the virtual environment today particularly with regard to process of urban planning with enfasis on architecture and urban design. On this sense the Internet is increasingly linked to social life in that through it the communicative possibilities gradually become limitless. Based on this understanding, the involvement with the global network is essential which implies the mobilization of communities and an accessible language to discuss urban planning and architecture theories.

These actions involve the understanding of the ongoing development of the cities, and takes into account the recurrence to the urban planning history. This recurrence to the past, translates as a key, which has the sense of reasoning about the interventions and proposals developed for cities and the role of professionals in attendance. In this process, the demands are very diverse and the urban

problems complexity is unparalleled. What is expanded is the range of references and more aware of regional specificities, coupled with the understanding of the cultural aspects of each place.

It is worth mentioning that we have today in Brazil an increasingly urban segmented and unequal. What is revealed in the big cities is repeated in small and medium-sized cities. Expansions without planning in urban areas not suitable for buildings continue to occur. The new building occupations put them at risk the own life of citizens. This process shows the legacy of past generations, in terms of cultural references, has been neglected, despite the efforts of agencies dealing with measures to protect the cultural heritage. For this reason the emergence of reviewing the practices of urban interventions about cities to reflect about a best future to the next generations. And that means rethinking the mechanisms of municipal management, with the effective participation of the communities involved. Even with the difficulties of community participation, even with the difficulties of every kind that arise, is important the social mobilization of the various sectors for improving the own community. And this mobilization requires a great effort to change the current reality. With this, the hopes are renewed by the possibilities opening up in terms of participatory efforts effectively. The perspective of urban development is one that considers social inclusion and income distribution, as challenges to be faced by local governments. In this way, think of the municipality as a whole and the relationship with neighboring municipalities is essential.

DIGITAL MEDIA AND PARTICIPATION CONSIDERING THE CULTURAL HERITAGE

The possibility of participation via the World Wide Web stands as an effective way to broaden the discussion about urban problems. The aim is to contribute to the urban and rural qualified development of the cities. Surveys and data already systematized in previous studies to be complemented stand as benchmarks. Such understanding involves studies and surveys about the past, in addition to readings taken in the current days. The references to the research involves different sources into a mosaic that involves international and national literature that has expanded the range of benchmarks and the cast of accomplishments and proposals related. The more precise and didactic approach, aiming at a better understanding of the mechanisms of community participation, allows to extend results already achieved toward the municipal planning.

It is worth mentioning that the participatory process on urban planning in Brazil is very recent. According to the "Estatuto da Cidade", as mentioned approved in 2001 this participation has become mandatory. In this sense, the polices applied to the cities need to consider the requests really relevant to citizens. To elaborate the master plans, planners have to listen to the communities. The guidelines for urban development must be presented during the meetings scheduled with the citizens, to consider the local specificity, particularly with regard to the socio-cultural issues.



Figures 02-03: Aspects of the website of the Urbanismomg group at the Federal University of Juiz de Fora and at the social media facebook. Source: Urbanismomg/UFJF.

The participatory processes mentioned here consider the need to meet people in the communities

in person or virtually. The meetings for discussion of demands in communities periodically occur in this planning process, with difference about the advantage of virtual meetings is that they do not have the time or place fixed. Thus, through social media and website the meetings are prolonged to possibility the continuity of discussions on urban issues. To achieve these goals it was created a website and a portal on the facebook.

On the oficial website linked to the Federal University citizens can understand the reseach activities of the group and the weekly schedule of works in the cities. Also they can write comments and send a webmail to formulate questions and indicate demands and expose doubts and presente itsopinions about the process. On the other hand, the social medias, particularly the portal facebook, allows access more dynamic and participation more direct. As for structuring the site content, we sought to sever the information about what is produced in the core and who are its developers. Among the selected material presented in the final articles highlight events such as conferences, publications in books and / or other media. The descriptive texts were developed during the work and appropriateness of content and publishing was done by a technical manager in order to make production accessible to the academic community and other stakeholders as well as the possible integration of the blog site with publications, virtual discussion groups, information and schedule projects. The contents presented on the facebook portal has proven effective, especially if combined with photos and movies.

As we have seen, websites today compose an important and indispensable communication tool because they allow not only the disclosure of the material and encourage discussion in academic circles. The role of social media nowadays cannot be ignored. Networking people from different circles it allows the possibility of enlarging participation as we can see in the various manifestations around the world. In this sense, the concern with the protection of cultural heritage, particularly related to the company towns, should consider these possibilities placed with websites and social media. Each contributing to enlarge the participation to the planning geared to think the protection of cultural references. Its worthing mentioned the opportunities with virtual media to disclose and even subsidize access through articles, book chapters, books, reports, virtual exhibitions, interviews in terms of video documentaries, among others. Moreover the systematization of data and access to information becomes easier in that it guarantees a link in a more dynamic and direct monitoring of the work by agencies, organizations, institutions, researchers, students, communities and others.

THE COMPANY TOWNS' CULTURAL HERITAGE AS A SUBJECT OF COMPARATIVE ANALISIS

Each city is unique, both for its layout and its buildings sets, either for its gardens, trees and by the diversity of people who live there. In this sense, the socio-cultural organization and the diversity of the territory, among others, distinguishes one from another urban area. And this unique condition, consisting of cultural and social values as well as political, economic, ecc. Is remarkable for community life the specific cultural references as cultural heritage itself. In this sense, the recurrence to the preservation of cultural heritage, among others, stands as an important strategy to involves community and municipal administrations with a regard to municipal planning. In case, this protection applied to company towns have very particular ways. Becomes necessary to consider, besides the parameters related to the conservation, other aspects of the problem linked to the theme of the company towns. And these are not simple, first by the scale approach, according to the dynamics of transformations guided by innovations that link the manufacturing organizations. On the other hand, in the case of obsolescence processes, these industrial environments become major problems. That is to say that much has been lost in terms of cultural references by disregard of these environments. Abandoned in valued areas of the cities, they end up ruining. New ventures tend to replace them, either for commercial constructions, whether for housing. both high standard and without any relation with industrial memory.

The emergence of thinking through planning seems to be fundamental, however considering the possibilities to preserve the references of company towns. The history of cities in Minas Gerais is

closely linked to manufacturing issues. Are countless cases of cities built especially to meet the industries as Juiz de Fora, Monlevade, Ipatinga, among others, striking examples of company towns. In this sense the recurrence to history of the cities for the study of company towns is essential. This approach is related to the urban planning's history in Minas Gerais, which opens the possibility for interventions at present. Thus, the prospect of comparative analysis outlined here arises so important to comprehend the industrial process in Brazil. And this comprehension is linked to the study of biographies composed life trajectories closely linked to the ideals and practices of the cities, particularly about company towns. This way, allows a specific vision of planners, particularly focused on addressing the problems of the cities. This approach has been important to the understanding the urban planning's history in Minas Gerais, directly linked to the industrial process. At the same time, allows the understanding of the complexity that is part of the multiplicity of issues brought before the actual process of cities' development.

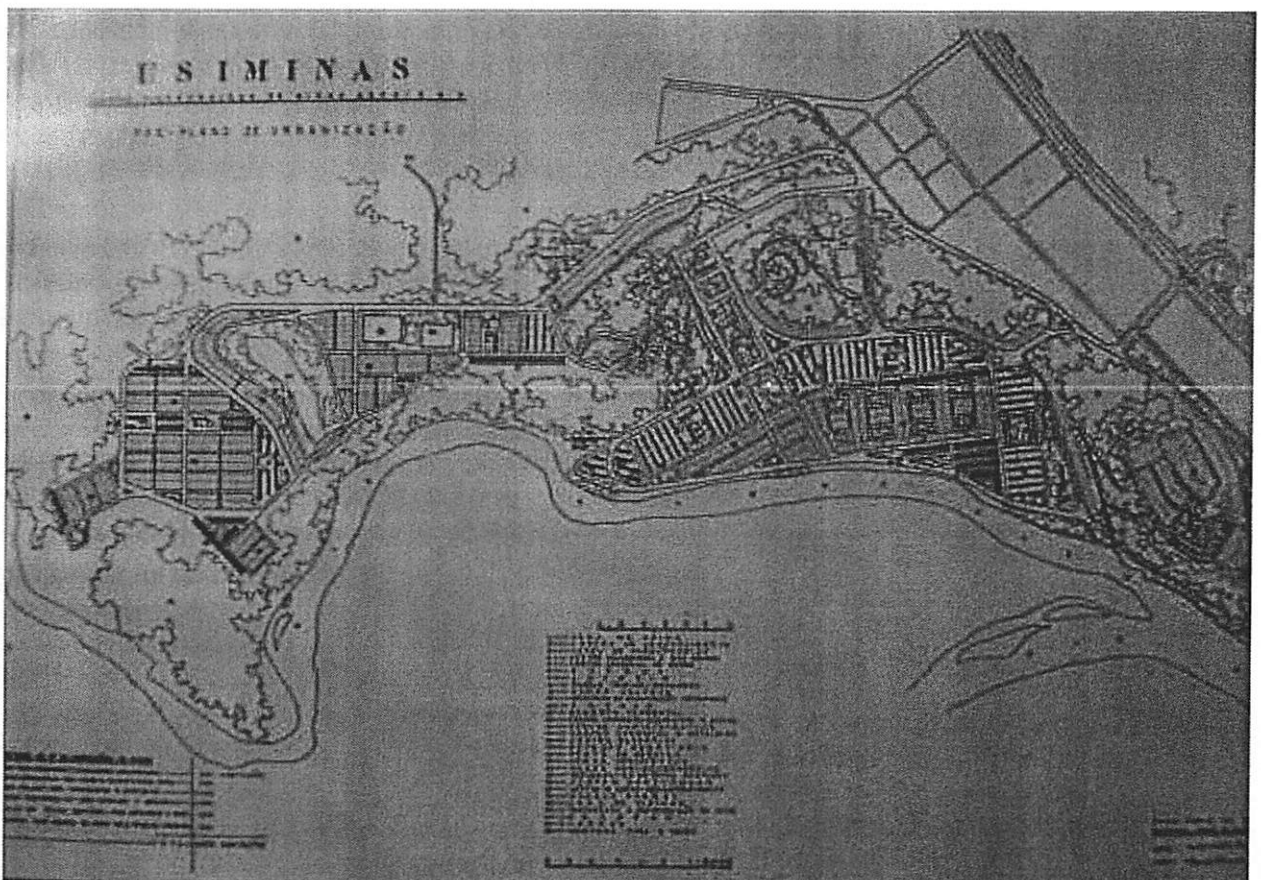


Figure 2: Aspect of the planned Ipatinga company town formulated by Raphael Hardy, in 1959, in the center of Minas Gerais. Source: Urbanismomg/UFJF.

At present the capacity of mobilization through social media stands as an important tool to be exploited for the city's renewal. Interactivity enables real-time voice by communities to think about the future of the city. In communities with approximations theories have sense training itself towards thinking urban planning, in terms of global guidelines for urban development, in terms of specific criteria for certain interventions, such as the rehabilitation of industrial areas, among others.

CONCLUSIONS

The importance of collective participation in the construction and consolidation of the urban and rural development should be emphasized qualified with the preservation of cultural heritage related to the tourist cities, particularly the examples of company towns rehabilitated as cultural centers. We understand that the urban qualification required is translated as the search for sustainable. We also believe that the conservation and preservation of cultural heritage is one of the ways to stimulate the local culture and enhance the identity of each place. Thus, recognition of the citizens in your area, the tourist, the highest quality of public spaces and the conservation of local and regional history.

Thinking and propose interventions and guidelines for cities to participation, allows a more comprehensive understanding of how to find the path of development considering the preservation of cultural heritage, especially linked to manufacturing issues represented by the company towns. This allows rethinking the industrial buildings, particularly when it is on obsolescence process, in view of the groups and their territories loaded with meaning and content. The participatory process inherent to planning that takes into account the preservation of cultural heritage stands as a major challenge. For researchers and students involved it is able to experience different realities as a laboratory. For communities involved aware of what is developing in the academic to see the importance of this work. It also enables a better understanding of the diversity that is revealed in these spaces, as reflections of multiple historical horizons.

REFERENCES

- ALEXANDER, C. (1976) *Une Expérience d'Urbanisme Démocratique*. Paris: Éditions du Seuil, 1976, *titre original: The Oregon Experiment, 1975*.
- ARGAN, G. C. (1993) *História da arte como história da cidade*. São Paulo: Martins Fontes, 280 p.
- BENEVOLO, L. (1991) *A Cidade e o Arquiteto*. São Paulo: Editora Perspectiva, 812 p., título original *La Città e l'Architetto*, tradução de Attilio Canciam.
- BRASIL. (2001) *Estatuto da Cidade*. Lei Federal nº 10.257, de 10 de julho de 2001.
- HOLANDA, S. B. de. (2001) *Raízes do Brasil*. São Paulo: Companhia das Letras, 220 p., 1a edição 1936.
- LEME, M. C. da S. (org.). (1999) *Urbanismo no Brasil: 1895-1965*. São Paulo: Studio Nobel; FAUUSP; FUPAM, 600 p.
- LIMA, F. J. M. de. (2003) *Por uma cidade moderna: Ideários de urbanismo em jogo no concurso para Monlevade e nos projetos destacados da trajetória dos técnicos concorrentes (1931-1943)*. São Paulo, Tese de Doutorado – FAUUSP.
- LIMA, F. J. M. de et al. (2007) *Caderno do Plano Diretor Participativo de Chácara/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Chácara.
- _____. (2007) *Caderno do Plano Diretor Participativo de Coronel Pacheco/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Coronel Pacheco.
- _____. (2007) *Caderno do Plano Diretor Participativo de Mar de Espanha/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Mar de Espanha.
- _____. (2007) *Caderno do Plano Diretor Participativo de Rio Preto/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Rio Preto.
- _____. (2007) *Caderno do Plano Diretor Participativo de Santana do Deserto/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Santana do Deserto.
- _____. (2007) *Caderno do Plano Diretor Participativo de Simão Pereira/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Simão Pereira.

- LIMA, F. J. M. de. (2010) *Urbanismo em Minas Gerais: Pelas Cidades*. Juiz de Fora: Editora da UFJF.
- MARX, M. (1999) *Cidade no Brasil em que termos?* São Paulo: Nobel.
- MORE, T. (1999) *Utopia*. São Paulo: Martins Fontes, 219 p., título original "Utopia", 1516, organização George M. Logan e Robert M. Adams, tradução de Jefferson Luiz Camargo e Marcelo Brandão Cipolla.
- TAFURI, M. (1979) *Teorias e história da arquitectura*. Lisboa: Editorial Presença; São Paulo: Martins Fontes.
- _____. (1985) *Projecto e Utopia: arquitectura e desenvolvimento do capitalismo*. Lisboa: Editorial Presença, título original "Progetto e Utopia", tradução de Conceição Jardim e Eduardo Nogueira.
- VEYNE, P. (1995) *Como se escreve a história; Foucault revoluciona a história*. Brasília: Editora da Universidade de Brasília, 198 p., título original "Comment on écrit l'histoire", 1971, "Foucault révolutionne l'histoire", 1978, tradução de Alda Baltar e Maria Auxiliadora Kneipp.
- VILLAÇA, F. (1998) *Espaço intra-urbano no Brasil*. São Paulo: Studio Nobel/FAPESP/Lincoln Institute.

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IN THE CITIES : URBAN PLANNING JOURNEYS TO PROTECTION OF CULTURAL HERITAGE, MINAS GERAIS, BRAZIL.

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ABSTRACT

Understanding the development process of cities arises so emerging today, translating as key reasons for the urban proposals thinking about new expansions, taking into account the participation. The justification of this proposal is structured in systematic surveys in previous studies related to urban planning, with discussions on the theme of memory and cultural heritage. In this sense, as already mentioned, the participation arises as essential to the approaches for the planning, towards the reversal of a framework within which many plans are not implemented. The themes that stand are diverse, such as memory protection and cultural heritage, environmental preservation, education, health, traffic, housing, urban infrastructures, among others. There is a need to consider a development that considers social inclusion and income generation. From the specifics of each locality, the goal is to define guidelines for urban expansion, considering the issue of sustainability and community awareness about the protection of cultural heritage. Thus, guidelines are sought to promote urban and rural development qualified, considering specific demands and local / regional, to raise awareness of the community, allowing spatial distribution, potential environmental and cultural heritage allowing a greater interface between researchers and community. The work is supported by Ministerio das Cidades, Ministerio da Cultura, CAPES, CNPq and FAPEMIG.

Key Words: *urban planning, sustainable cities, participation.*

INTRODUCTION

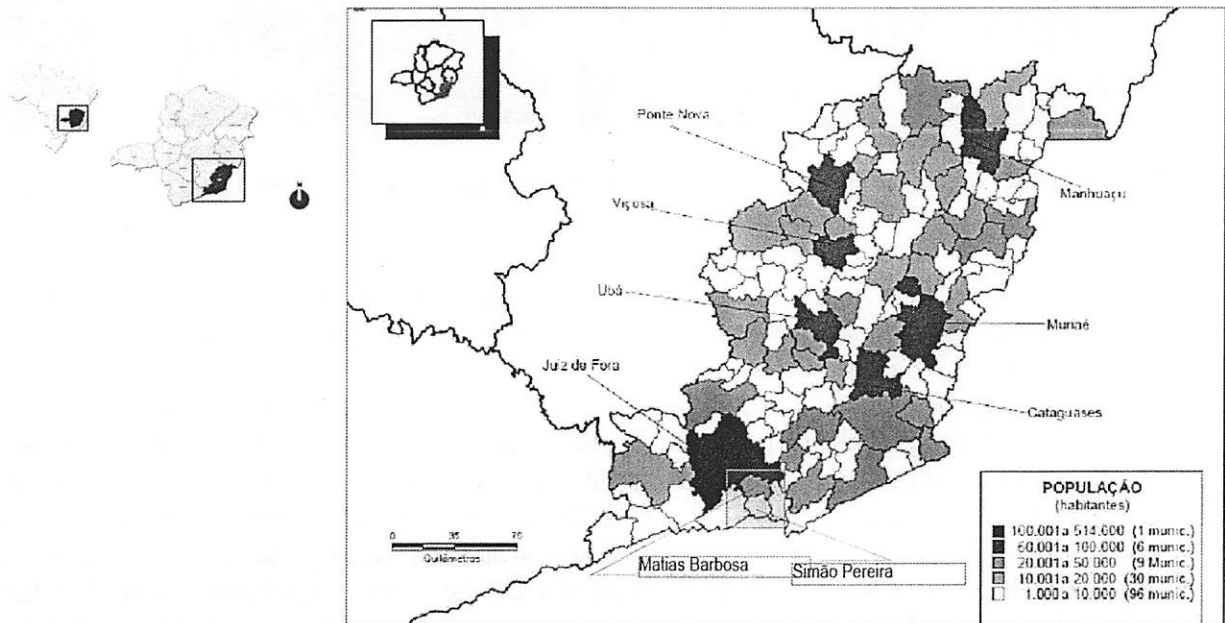
The elaboration of master plans arises as a process enough current in Brazil. In this process the participation is essential, considering the possibilities for democratic management of cities, according to Brazilian law n° 10.257, named "*Estatuto da Cidade*", approved in 2001. Many difficulties arise to think about the future of the cities. This conclusion can be found by the critical state of development of the Brazilian urban centers. The environmental degradation is revealed so dramatically in these urban centers. Polluted rivers, forests cleared are examples that defied added to countless other problems to annoy the citizens. Today in Brazil agglomerations are increasingly segmented and unequal. New subdivisions became commonplace in urban expansions, in particular, along the rivers and hills and mountains. In many cases their early development of the city has been set improperly.

The paper is linked to a continuing research in Minas Gerais with emphasis on the history of planning. The intention of this study is to expand references in terms of urban planning thoughts and practices, in addition to thinking about currently city planning proposals. The comparative approaches are placed on this path both in terms of urban planning thoughts and city planning practices. These practices here were applied to two small cities named Matias Barbosa and Simão Pereira, both cities located in the southeast of Minas Gerais, Brazil.

For a reflection on the future development of our municipalities is necessary to understand the past and the present, in particular the history of the city, that is all that has been done and thought in the sense of planning. In this way, we have an understanding of urban growth and the relationship with the neighboring towns. This methodological strategy allows us to understand the need to define and set guidelines for urban planning in the sense of a legal instrument to regulate urban development. It thus appears the need to think of sustainable development and that provides jobs and income for citizens. It must be stressed that this sustainable development should take into account the social and cultural inclusion.

This understanding of the Municipalities and also its territory in the relationship with other communities proves to be indispensable in actuality. In many cases the development of cities disregards cultural heritage. The focus for the municipalities, in order to arrive at a comparative analysis with approach on specific local and regional needs, aims to reverse this unsustainable framework of transformations. In short what is required is to enable the understanding of the needs of socio-cultural development in view of the future for the new generations.

The paper presented here summarizes actions aimed at reflections on planning with participation. In this sense the journeys of planning to protection of the cultural heritage in Minas Gerais, Brazil, have a sense of empowerment of citizens. The process includes diverse topics aimed at understanding the meaning of urban planning. As a multidisciplinary laboratory this journeys include participation, to elaborate master plans to the cities of Matias Barbosa and Simão Pereira, mentioned above. (Figures 01-02).



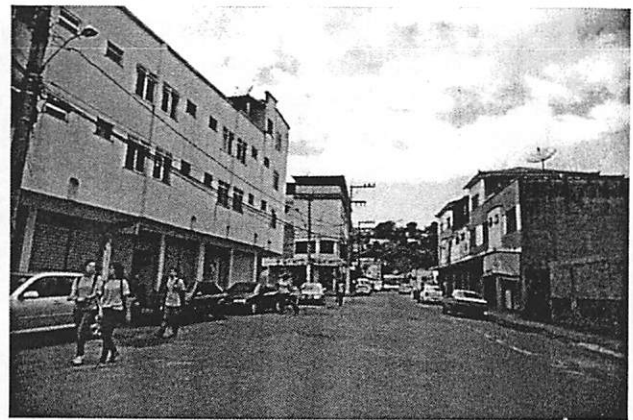
Figures 01-02: The location of the cities in the Southeast of Minas Gerais, Brazil. Source: Urbanismomg/UFJF.

IN THE CITIES : URBAN PLANNING JOURNEYS, MATIAS BARBOSA AND SIMAO PEREIRA, MINAS GERAIS, BRAZIL

The transformation of the territories without concern with the planning, without environmental sustainability criteria, is revealed as the most common. This urban growth has gradually expanded the boundaries of urban areas. The result of this occupation is the destruction of the vegetation cover and the gradual pollution of rivers, such as an unsustainable process. Other problems are constituted by several inadequate constructions and the lack of infrastructure urban, as some of the components of this process.

In Brazil, the concerns with participation in public policy is very recent. As mentioned according to the "Estatuto da Cidade", approved in 2001 this participation has become mandatory. In this sense, the polices applied to the cities need to consider the requests really relevant to citizens. To elaborate master plans, planners have to listen to the communities. The guidelines for urban development must be presented during the meetings scheduled with the citizens, to consider the local specificity, particularly with regard to the socio-cultural issues.

The municipalities have considered here by the journeys of planning had a similar development as a urban center formed from an original nucleus, usually around a square where there is a church or a chapel. The origins of the city of Matias Barbosa refer to the year 1709 but only in 1923 the municipality was recognized so emancipated. Also Simao Pereira have the origins around 1699, so emancipated only in the year of 1963. The history of these cities is linked to important cultural references to Minas Gerais. (Figures 03-04).



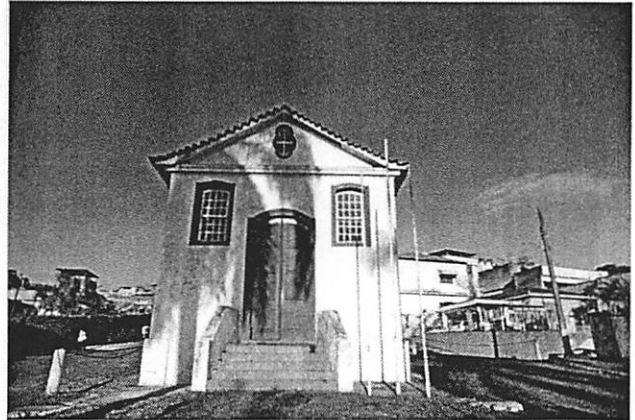
Figures 03-04: Aspects of Simão Pereira and Matias Barbosa, in Minas Gerais, Brazil. Source: Urbanismomg/UFJF.

The natural environment and local culture, this in terms of constructions, customs and traditions, yet allow remembering the past. However, both of this municipalities have an urban growth process without a planning control.

The intention of this journeys of planning is to promote workshops with communities to explain about the importance to think about the possibilities of development, particularly that which consider the references of the cultural heritage. In synthesis, the aim is to raise awareness of citizens to think about the future without, however, forgetting the past. And this thought about the future is like searching a way to find a comprehensive master plan. For this, the guidelines are widely discussed with citizens. The perspective that arises is to search ways to reverse the degradation process that gradually interferes on the local culture. With these guidelines we have the possibility of formulating participatory master plans. Surely the active involvement of citizens in public affairs, in particular in the issues of planning, should be increased. The active participation in the process of master plans' formulation should be encouraged considering that this is required as mentioned above.

PROTECTING THE CULTURAL HERITAGE

The challenges for the municipal administration are numerous when we talk about planning, especially if it comes to thinking in the development guidelines considering the cultural heritage with participation. The difficulty in the planning process is to know exactly what are the priorities. However, the guidelines discussed with communities should also take into consideration aspects such as environment, urban mobility, tourism, economy, education among others issues. This involvement of the citizens on the planning process is important to distinguish the degrees of priority in each theme.



Figures 05-06: Aspects of Simão Pereira and Matias Barbosa, in Minas Gerais, Brazil. Railway station of Paraibuna and Rosario's Chapel. Source: Urbanismomg/UFJF.

The natural environment and the urban areas as places of sociability distinguish the municipal territory. In this sense the socio-cultural context confer an individual image of each city. Therefore the importance to understand of cultural heritage at a local and regional levels. It is worth saying that the valorization of cultural heritage of the municipalities depends so of the citizens more that of the technicians. The workshops of the journey of planning mentioned have contributed to the strengthening of sense of community, discussing the guidelines development that consider this local and regional levels.

However the difficulties to the citizens mobilization is real. Becomes necessary to make efforts in different directions, with various means of dissemination of the workshops. Brochures, posters and also social medias should be employed. Gradually we must integrate the daily life of cities. In this sense, at this stage of the journey of planning, showed up important to divide the citizens by sectors to implement the workshops. The first sector selected is the educational. By publicizing the planning with teachers reached through the new and old generations in an indirect way. The intention, however, is to work directly with the entire community. In this way, we think that planning becomes an everyday thing. With this planning as something thought about the day-to-day of citizens that placed on a democratic perspective.

CONCLUSIONS

The process reported here has just had its beginning. The first impressions of the field surveys and interviews with the communities are very good and encouraging the journey of planning. The expectation is that with workshops on the journeys to be performed with citizens the level of understanding will be reached for the definition of planning guidelines. It is worth mentioning that each city is unique, both for its layout and its sets built, either for its gardens, trees and by the citizens who live there. Thus, the socio-cultural organization and the environment where it serves, among others, distinguishes the urban areas. And this unique condition, composed of cultural and social values, and political, economic, etc., is remarkable for community life. At a time when these values are lost - and this has been quite common nowadays in Brazil- it's as if we lost the specifics of each place. And these are linked to specific cultural references, cultural heritage itself, that what we must, as professionals emphasize on the journeys of planning.

It is worth to mentioning that the municipalities should be considered in a different way to reverse the condition of unsustainable urbanization process. In this sense, think guidelines for a sustainable development of municipalities do not seem to be so difficult when citizens are involved in the process with participation. Beyond the difficulty to think of a participatory public management the idea of participation becomes more common. In this process, therefore, the direct involvement of citizens increases the sense of belonging to the land and enhances the legitimacy of public policies.

This process also implies rethinking the urban development model as crucial to ensure the future generations. In this way the planning strategy is directly related to the conservation and enhancement of cultural heritage. The recurrence of the past as a historical process is essential, in terms of depth practical and theoretical, as a basis to motivate the urban policies in the present. This methodological strategy, finally, that includes the level of awareness, is the intention of the journeys of planning, to encourage participation in order to create opportunities for a better future for communities.

REFERENCES

- ALEXANDER, C. (1976) *Une Expérience d'Urbanisme Démocratique*. Paris: Éditions du Seuil, 1976, *titre original: The Oregon Experiment, 1975*.
- ARGAN, G. C. (1993) *História da arte como história da cidade*. São Paulo: Martins Fontes, 280 p.
- BENEVOLO, L. (1991) *A Cidade e o Arquiteto*. São Paulo: Editora Perspectiva, 812 p., título original *La Città e l'Architetto*, tradução de Attilio Canciam.
- BRASIL. (2001) *Estatuto da Cidade*. Lei Federal nº 10.257, de 10 de julho de 2001.
- HOLANDA, S. B. de. (2001) *Raízes do Brasil*. São Paulo: Companhia das Letras, 220 p., 1a edição 1936.
- LEME, M. C. da S. (org.). (1999) *Urbanismo no Brasil: 1895-1965*. São Paulo: Studio Nobel; FAUUSP; FUPAM, 600 p.
- LIMA, F. J. M. de. (2003) *Por uma cidade moderna: Ideários de urbanismo em jogo no concurso para Monlevade e nos projetos destacados da trajetória dos técnicos concorrentes (1931-1943)*. São Paulo, Tese de Doutorado – FAUUSP.
- LIMA, F. J. M. de et al. (2007) *Caderno do Plano Diretor Participativo de Chácara/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Chácara.
- _____. (2007) *Caderno do Plano Diretor Participativo de Coronel Pacheco/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Coronel Pacheco.
- _____. (2007) *Caderno do Plano Diretor Participativo de Mar de Espanha/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Mar de Espanha.
- _____. (2007) *Caderno do Plano Diretor Participativo de Rio Preto/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Rio Preto.
- _____. (2007) *Caderno do Plano Diretor Participativo de Santana do Deserto/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Santana do Deserto.
- _____. (2007) *Caderno do Plano Diretor Participativo de Simão Pereira/M.G.*. Juiz de Fora, UFJF, Prefeitura Municipal de Simão Pereira.
- LIMA, F. J. M. de. (2010) *Urbanismo em Minas Gerais: Pelas Cidades*. Juiz de Fora: Editora da UFJF.
- MARX, M. (1999) *Cidade no Brasil em que termos?* São Paulo: Nobel.
- MORE, T. (1999) *Utopia*. São Paulo: Martins Fontes, 219 p., título original "Utopia", 1516, organização George M. Logan e Robert M. Adams, tradução de Jefferson Luiz Camargo e Marcelo Brandão Cipolla.
- TAFURI, M. (1979) *Teorias e história da arquitetura*. Lisboa: Editorial Presença; São Paulo: Martins Fontes.
- _____. (1985) *Projecto e Utopia: arquitetura e desenvolvimento do capitalismo*. Lisboa: Editorial Presença, título original "Progetto e Utopia", tradução de Conceição Jardim e Eduardo Nogueira.
- VEYNE, P. (1995) *Como se escreve a história; Foucault revoluciona a história*. Brasília: Editora da

Universidade de Brasília, 198 p., título original “Comment on écrit l’histoire”, 1971, “Foucault révolutionne l’histoire”, 1978, tradução de Alda Baltar e Maria Auxiliadora Kneipp.

VILLAÇA, F. (1998) *Espaço intra-urbano no Brasil*. São Paulo: Studio Nobel/FAPESP/Lincoln Institute.

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LAND USE AND SUSTAINABLE FOREST MANAGEMENT IN SABAH: ISSUES AND CHALLENGES

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INTRODUCTION

Since the United Nations summits in Rio de Janeiro, 1992, sustainable forest management (SFM) becomes an important approach for balancing the social, economic and environmental aspect in the development. For example Rio Declaration and Forest Principles in 1992, the definition of SFM applied by many countries in the world has gradually evolved from a focus on sustained timber production to concepts which embrace economic, environmental and social aspects (Jenkins & Groombridge, 2007). In the case of Sabah, the existing participation all stakeholders fail to provide participant especially for local community with access to the decision making in forest management process. Sabah is rich in forest resources and among the most biologically diverse in the world (Koh & Wilcove, 2007). Unfortunately, over the last 20 years the emphasis on developing the state's economy has led to significant and drastic changes in the landscape of the land use. As the state developed, easily accessible forest land was harvested and cleared for conversion to agriculture. According to Hoh and Ishak (2001) the main crop now covering Sabah is oil-palm, which provides a significant source of income to the state and is the main export product. As the availability of valuable hardwood species declined, so did the rate of logging, but this did not stop forest lands from being depleted further. The development of oil-palm plantations began in earnest, especially in the late 1980s and early 1990s (Fletcher, 1997). In this context, many of the private owners of these plantations come from Peninsular Malaysia seeking the cheaper, abundantly available land in Sabah. Degraded forests were degazetted and cleared to make way for plantations, and the rate of conversion to oil-palm was extremely high. This research presents the land use and forest management issues from three major stakeholder's perception as an incentive to achieving sustainable forest management in Lower Kinabatangan, Sabah. The existing Lower Kinabatangan forest management process and oil palm development was explored to determine the impacts, issues and opportunity in order to achieve sustainability.

PROBLEM STATEMENT

Sabah is the state in Malaysia with the biggest acreage under oil palm and has contributed significantly to the development of the Malaysian economy (Hoh & Ishak, 2001). The total oil palm area in Sabah has increased to 1.4 million hectare and the state produced 5.3 million tons of crude palm oil in 2010. The palm oil industry is a key component of the domestic economy, and an influential player in the global edible oils market and currently palm oil is the biggest contributor to the Sabah economy. In this situation, the potential for conversion of Sabah's rainforests to palm oil plantations as a result of biofuel policies in Malaysia has generated understandable concern among policy makers and the public. Such an outcome would undermine the environmental credentials of biofuels as well as cause ecological damage, with consequential economic and social effects. While the impacts of converting forest to oil-palm have received considerable attention in recent years, the incremental role that biofuel production has played in deforestation is less well understood (Hoh & Ishak, 2001).

According to Gallagher and Patrick-Riley (1989), a recent report commissioned by the United Kingdom Government found that displacement of existing agricultural production as a result of biofuel demand is accelerating land-use change and, if left unchecked, will reduce biodiversity and may even cause

increases rather than reductions in GHG emissions. During the period 1990 to 2005, more than half of oil-palm expansion in Sabah occurred at the expense of forests (Koh & Wilcove, 2007). However, in 1997, several changes occurred. The continued deterioration of Sabah's forest was evidence that the 1984 changes to the Forest Enactment had been insufficient to protect forest resources and improve forest management. State policy was amended to replace short-term with long-term licences for example Sustainable Forest Management License Agreement (SFMLAs) in order to encourage better management of forests (Sabah Forestry Department, 1998). The objective is to conserve the remaining forest lands and manage them sustainably in order to improve long-term timber productivity and environmental protection. Conditions for the licences are based on a model forest project in Deramakot Forest Reserve, which is managed by SFD within FMU and has been certified as well managed in meeting the principles and criteria of the Forest Stewardship Council (FSC) (Sabah Forestry Department, 2007a). According to Mannan and Yahya (1997), there are many factors that have caused "massive depletion of forests" in Sabah such as, harvesting beyond the forest's ability to regenerate; not allowing forests to recuperate after logging through premature "re-entry" or "relogging"; damage to residual stands because of bad logging practices; abandonment of silviculture and forest rehabilitation; revenue priority overruling environmental limits; political changes and instability and the forestry profession's inability to exert influence on powerful groups. It has been estimated that the area of primary forest cover dwindled from 2.8 million ha to about 300 000 ha between 1975 and 1995 (Mannan & Yahya, 1997) and during the same period, the area of disturbed forests nearly doubled. According to Mannan and Yahya (1997), the most drastic change was in the primary forests of Class II Production Forest, which dropped from 98% of cover in 1970 to a mere 15% in 1996. At the same time, the first major change in forest laws occurred in 1984, when the Forest Enactment of 1968 was revised. In this case, forest reserves were divided into seven classes, all existing forest reserves were regazetted to include the new classes of forest, and new reserves were gazetted for example, Deramakot Forest Reserve became Deramakot Forest Reserve and this change shows that forest reserves could no longer be reclassified within Sabah Forest Department but any changes to the classification of forest reserves, especially those in Class II Commercial Forest, required the approval of the State Cabinet and the Governor of Sabah (Sabah Forestry Department, 2007a).

In the case of Lower Kinabatangan, Sabah Malaysia, according to Payne (1997), the progressive disappearance and degradation of tropical rainforests constitutes one of the major environmental problems. Lower Kinabatangan is the largest and most important wetland in Sabah, Malaysian and consists of different types of forest, including freshwater swamp forests, secondary dry land forest, limestone outcrops and lakes (WWF Malaysia, 2004). A hundred years ago the Lower Kinabatangan was almost completely covered by forest but today most of these forests have been cleared for agriculture and whatever forest remains are heavily degraded (WWF Malaysia, 2005). Overall, there is a problems highlights weakness in the early concepts, planning and implementation of forest management in Sabah, for example, insufficient cooperation and coordination among different government extension agencies; low prioritization, commitment and support for forest management projects among stakeholders; lack of community participation which means communities were not involved from the beginning of planning and decision-making for forest management, and they were insufficiently informed about the aims and objectives of forest management; cultural differences between extension personnel and communities, which created communication gaps; lack of cohesiveness and internal problems within resettled villages for example land and boundary disputes and fully dependency on government handouts (Mannan & Yahya, 1997). Besides, some environmental campaigners claim that in 15 years, 98% of the rainforests in Indonesia and Malaysia will be gone unless drastic action is taken to find ways of producing sustainable forest management.

RESEARCH OBJECTIVES

Based on the problem presented, this study deals with investigation of the forest management in term of their issues especially the land use conversion to agriculture, current practices of forest management system and process of sustainable forest management in Lower Kinabatangan based on the perception of three major stakeholders (Government, Private Sector and Local Community). To find the answers, this study has the following research objectives:

- i. To examine the perceptions of the three major stakeholders (Government, Private Sector and Local Community) regarding the environmental issues affecting Lower Kinabatangan area.
- ii. To investigate the perceptions of the three major stakeholder (Government, Private Sector and Local Community) regarding the current practice of forest management in Lower Kinabatangan area.

METHODOLOGY

For this study, quantitative data collection methods were used. Data were collected during the field work in Lower Kinabatangan, Sabah. Primary data were collected using a survey questionnaire and stakeholder interviews. While, secondary data using the relevant documents related to the case studies were collected included reports, plans, and brochures. During the case study visits, several relevant meetings, gatherings, and workshops were observed. Notes were taken at these events and these notes were used as additional or secondary data. Type of data that been collected from previous work, government offices, universities and NGO offices such as map (Map of Kinabatangan Sabah, Map of distribution of forest in Malaysia, Map of land use in Lower Kinabatangan and Map of forest cover change in the world) and statistic data (type of forest in Sabah and Lower Kinabatangan, statistic of forest cover change in Sabah, Malaysia and statistic data for fragmented land in Lower Kinabatangan because of oil palm development). The main data sources were newspaper, dissertations, annual reports, journal articles, policies, legal documents and statistics. Data were also collected from Sabah Forestry Department (SFD), Sabah Wildlife Department (SWD), Kinabatangan District Office, HUTAN-French WWF, PACOS TRUST, Partner for Wetland (Malaysia WWF), Sabah State Town and Regional Planning Department, Sabah State library HQ and branches, Environmental Conservation Department, University of Malaysia Sabah and Sabah Branch of WWF.

The quantitative methods will include a questionnaire survey of government, private sector/ NGOs and local community in Lower Kinabatangan. In this context, the used of questionnaires survey aimed to achieve the first and second objective of this study. This research adopted Probability Sampling Method- precisely the Stratified Random Sampling method. My choice of this method was informed by the uniform nature of the population. This method also gives each member of the population (subdivision) equal chance of being selected, thus making the final result truly representative of the entire population. A stratified random sample is a sampling plan in which a population is divided into L (strata) mutually exclusive and exhaustive strata, and a simple random sample of n elements is taken within each stratum n_h . The sampling is performed independently within each stratum (Yamane, 1967). According to Yamane (1967), a stratified random sample is taken the same way as a simple random sample, but the sampling is done separately and independently within each stratum. If we let N_1, N_2, \dots, N_L represent the number of sampling units within each stratum, and n_1, n_2, \dots, n_L represent the number of randomly selected elements within each stratum, then the total number of possible stratified random samples is $(N_1/n_1) \times (N_2/n_2) \times \dots \times (N_L/n_L)$ which is less than or equal to (N/n) the number of possible samples based on simple random sampling (Yamane, 1967). Using the stratified random sampling approach (Yamane 1967), the sample size was determined as follows:

$$n = N/[1+N(e^2)]$$

Where n = sample size, N = population size, e = error of estimation; confidence level is at 95% and error margin at 5%. Sample size was determined as:

$$n = \frac{283}{(283 \times 0.05)^2 + 1} = 160$$

Strata	Population (N)	Sample size (n)
Strata 1 (Government Group)	N_1 105	$n_1 = 59$
Strata 2 (Private Sector Group)	N_2 80	$n_2 = 45$
Strata 3 (Local Community Group)	N_3 98	$n_3 = 56$
Total	283	160

In this study 160 questionnaire were sent to three different groups of respondents via email and "face to face" interview. The response rate was 56% (160 questionnaires in number). However, out of the 160 returned questionnaire, 45 was rejected and only 115 (GG=48, PSG=35 and LCG=32) were usable. Overall, the sample sizes of this currents study was only 40.6% (115 respondents out of 283 population elements). As for the sample sizes, a researcher generally would not facto analyse a sample of fewer than 50 observation and preferably the sample sizes should be 100 or larger (Bartlett, Kotrlik, and Higgins, 2001)

Analysis of data for quantitative methods was done using software packages like Microsoft Excel and SPSS 12.0 for the graphical presentation of the data and statistical analysis. The quantitative data was analysed using various statistical and economic analyses to achieve the objectives of this study. Firstly, simple descriptive statistic (mean, standard deviation, etc) were computed to specify the major characteristic of respondents and values of some parameters of interest pertaining to the SFM practices in the study area. The questionnaire survey data were entered into Microsoft Excel and the statistical analysis of the data was conducted using mainly SPSS software programmed; a statistical package mostly used in social sciences studies. The analysis was conducted mainly by employing descriptive statistics, including simple mean responses and F-tests. An analysis of Variance (ANOVA) tests was generally used to determine the different groups of respondent perception, understanding, and belief in sustainable forest management practices in study area. Results were reported as significant when $p \leq 0.05$ significance level.

RESULT AND DISCUSSION

Result from the questionnaire will answer the first and second objective of this research. Details in this section were based on field survey data of 115 respondents in the Lower Kinabatangan. The respondents' categories into three groups namely, Government (G) ($n=48$), Private Sector (PS) ($n=35$) and Local Community Group (LC) ($n=32$). These sections were obtained the perception of the major stakeholders (G, PS and LC) regarding the environmental issues affecting the Lower Kinabatangan and also the current practices of forest management in the Lower Kinabatangan area.

Respondent Perception and Attitude of Environmental Issues

This section revealed the objective one of this thesis about the perception of three major stakeholders regarding the environmental issues in study area. From the results, in term of environmental problems, the Government, Private sector and Local community showing the same result which is floods (10.24%, 7.68% and 17.07%) and water pollution (16.56%, 13.70% and 4.36%) are the top concerns of all respondents and wildlife preservation is considered to be the fourth most important environmental problems in the Lower Kinabatangan (Figure 1). Overall, all respondents are gave similar perception on

this issues.

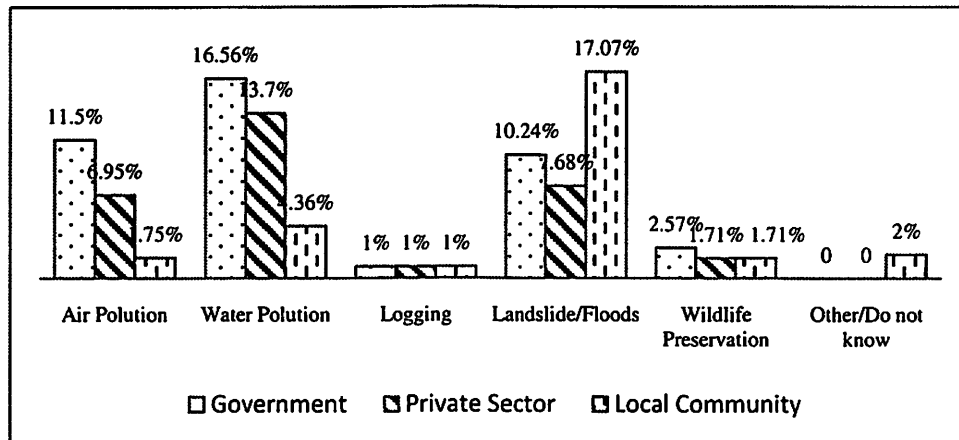


Figure 1
Ranking of environmental problems in Lower Kinabatangan (n=115)

In this section, for the purposes of the awareness of environmental concern, the attitude or perception of the respondent to sustainable forest resources protection was further explored. Respondents were presented with a series of attitudinal statements about the sustainable forest resources and protection and asked whether they agreed or disagreed with each statement. Overall, the respondents gave the response which is reveal a high positive value placed on protection the natural resources (Table 1).

Table 1
Attitudinal Statements on protection of forest resources and the percentage of respondents who agree and disagree with each statement (n=115)

		Strongly Agree (%)	Agree (%)	No Opinion (%)	Disagree (%)	Strongly Disagree (%)
It our responsibility to protect the environment from development (regardless of the cost)	<i>Government</i>	11.14	21.72	1.76	4.54	2.4
	<i>Private Sector</i>	0.0	22.59	1.76	4.54	1.6
	<i>Local Community</i>	6.57	8.69	11.47	1.0	0.0
We should reduce our use of the environment now, so that our next generation may benefit from it.	<i>Government</i>	24.26	17.37	0.0	0.0	0.0
	<i>Private Sector</i>	3.46	21.72	2.5	2.0	1.0
	<i>Local Community</i>	11.26	13.90	2.5	0.0	0.0
Malaysia needs to develop the forests, seas,	<i>Government</i>	7.94	13.28	0.0	18.0	2.53
	<i>Private</i>	5.29	15.05	1.0	6.58	1.69

and land to create jobs and incomes (regardless of the environmental damage)	<i>Sector</i>					
	<i>Local Community</i>	1.76	1.77	0.0	17.14	6.76
Even though I don't use the forest resources now, I am prepared to pay to protect them in case I want to use them in the future	<i>Government</i>	0.0	19.03	0.0	22.38	0.0
	<i>Private Sector</i>	2.0	17.30	0.0	11.18	0.0
	<i>Local Community</i>	0.0	8.65	7.82	9.46	2.0
It is worth spending money to protect the forest because they help to protect sustainable ecosystem in the area	<i>Government</i>	2.64	39.29	0.0	0.0	0.0
	<i>Private Sector</i>	3.53	13.29	5.0	5.83	3.0
	<i>Local Community</i>	8.82	9.61	5.0	4.16	0.0

Respondent Perception on Willingness to pay (WTP) for Sustainable Forest Management

Overall, 50.43% (58) of respondents reported a positive willingness to pay (WTP) for the protection of the forest resources of Lower Kinabatangan and 49.57% (57 respondents) say "no" and refused to answer the WTP question (see Figure 2(a) and Figure 2(b)).

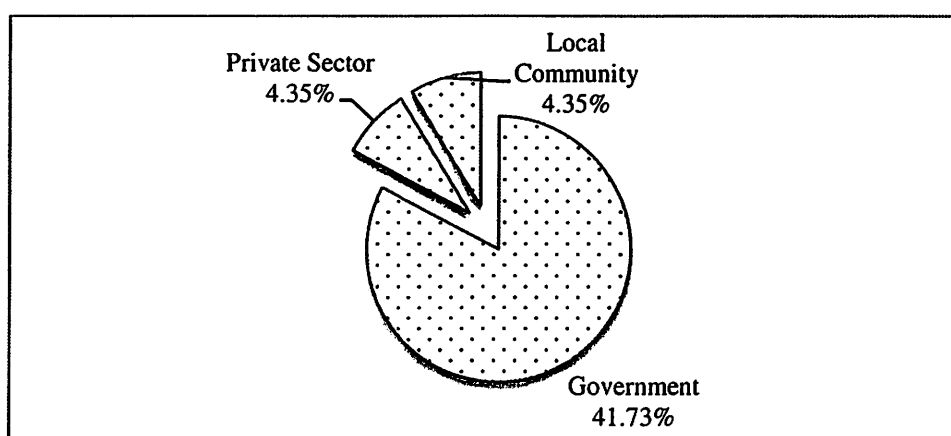


Figure 2(a)
Summary of "Yes" responses to the willingness to pay question (n=58)

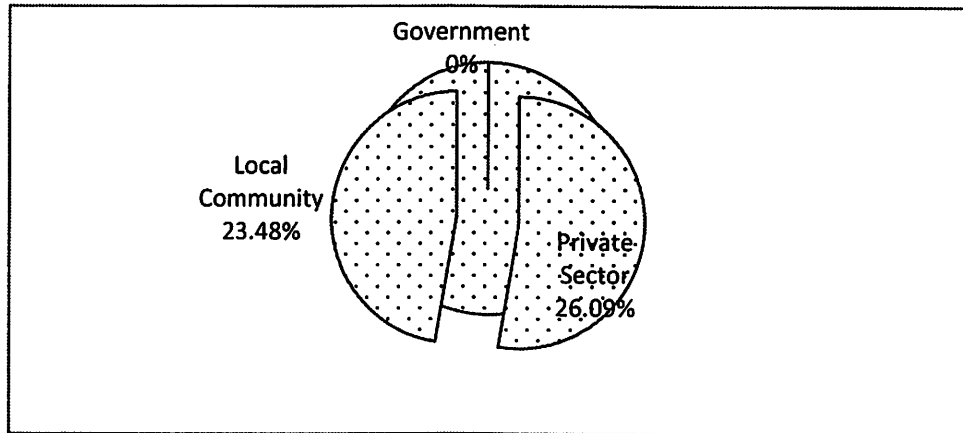


Figure 2(b)
Summary of "No" responses to the willingness to pay question (n=57)

There were some slight differences in the reasons that motivated or encourage the respondents to pay more. A summary of the motivations for being willingness to pay the conservation of forest resources and biodiversity are presented in figure 3. The most common reason of motivation appears to be concern over the loss of forest and related sustainable ecology.

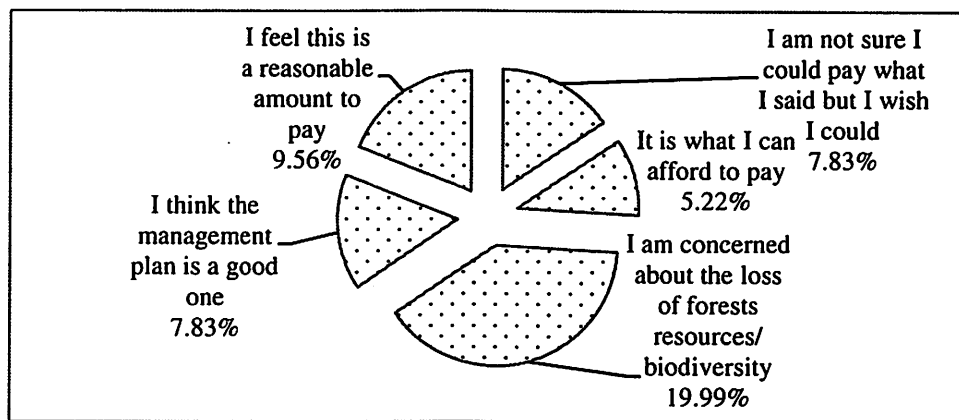


Figure 3
Reasons why respondents are willingness to pay to protect the forest resources of Lower Kinabatangan (n=58)

Furthermore for those who did not want to pay more or respondents stating a zero willingness to pay were asked to express their personal reason for not wanting to contribute anything to the protection of Lower Kinabatangan's forest resources. For this section, reason for not wanting to pay can be divided into seven categories. From the results in Figure 4, it shows that the respondent believes that the user should pay more to protect the forest resources which is refer to the tourist who came to Lower Kinabatangan to see the nature and wildlife. Besides that, most of the local community stated that it is the government responsibility to protect the forest in order to sustain the ecosystem of Lower Kinabatangan. Motivations or reason for not being willingness to pay toward the protection of the forest resources and biodiversity of Lower Kinabatangan are classified in Figure 4.

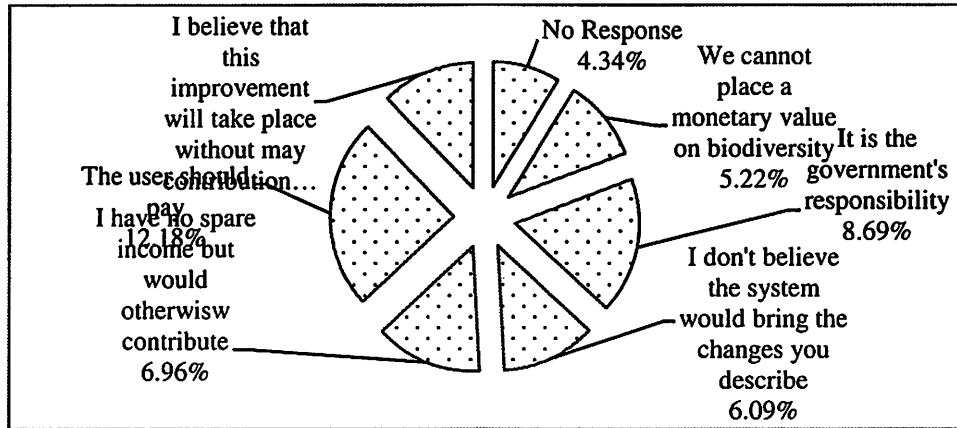


Figure 4

Reasons why respondents are not willing to pay to protect the forest resources of Lower Kinabatangan (n=57)

When respondent were asked how much more they were willing to pay, 45.0% were of the opinion that an extra amount between RM 2 and RM 5 was acceptable, while 41.7% said less than RM 2 would be preferable. Nevertheless, 13.2% of the respondents were willing to pay more than RM 5.

Respondent Perception of Lower Kinabatangan's Current Practices of Forest Management.

This result will answer the second objective of this study. There are several opinions or perception on whether the management practices of forest resources in Lower Kinabatangan meets the criteria of sustainability requirements. In this situation, forest resources in Lower Kinabatangan have been exploited rather than managed, and that continuous exploitation of forest resources becomes a major constraint to the potential of achieving the sustainable forest management. To investigate respondents' perception in sustainability or otherwise of the forest management practice in Lower Kinabatangan, a series of questions with categorical and scale responses were given. From the results in Figure 5, overall, 53% of the respondents namely Government (21.72%), Private sector (14.77%) and Local community (16.51%) indicated that current forest management practice is not sustainable. However, 30% of them believed that forest management is sustainable and the rest 17% believe that even though the current forest management is not sustainable but it can be improved with appropriate approach in term of sustainable forest management.

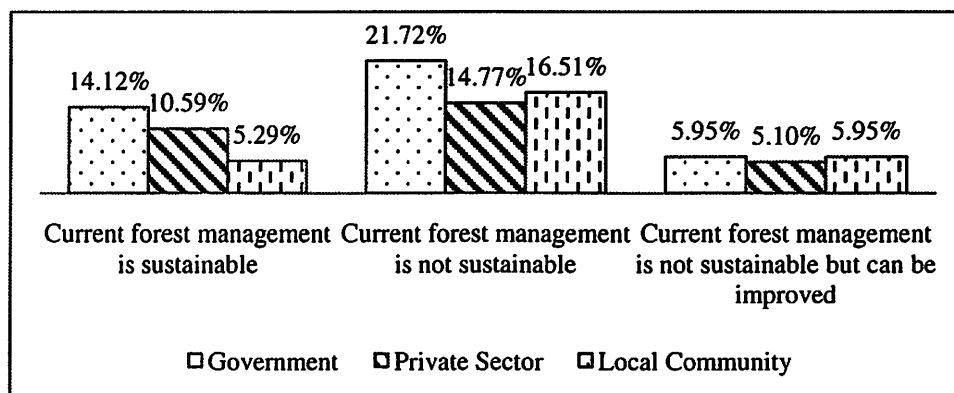


Figure 5

Response of current practice of forest management in Lower Kinabatangan

Respondent Perception on Efficiency and Successful of Legislation and Forest Management in Lower Kinabatangan

This section shows the result from respondent regarding the efficiency of legislation and forest management in the study area. To assess respondents' perceptions relating to efficiency of forest legislation and management systems in ensuring sustainable forest management, respondents were asked to show their level of agreement or disagreement on the successful or efficiency of three key areas for which success or failure has profound implications on forest management system in Lower Kinabatangan. From the result in Figure 6 and Table 2(a) and Table 2(b), the respondent stated for disagreed that current forest management and planning and also the forest protection and strategies is effective action for sustain the forest management in Lower Kinabatangan. But, the respondent believes and agreed that forest legislation and policy can support the process of forest sustainability in study area.

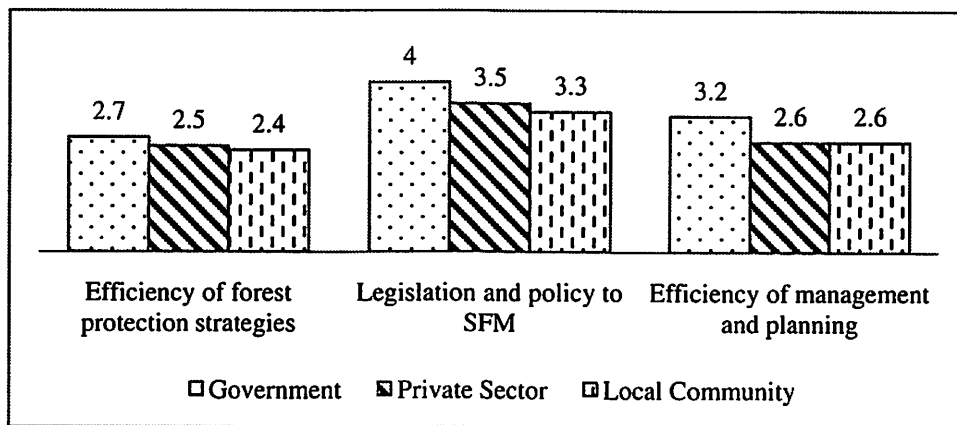


Figure 6

Response on efficiency and successful of legislation and forest management for the sustainable forest management in Lower Kinabatangan (n=115)

For further analysis, an ANOVA test was used to analyze whether there were any significant differences between the mean responses from the three groups of all respondents. As shown in Table 2, the efficiency of current forest protection strategy in Lower Kinabatangan was not significant (p-value 0.111) but the efficiency of forest management and planning (p-values 0.000) and legislation and policy (p-values 0.001) to forest sustainability in Lower Kinabatangan were significant at $\alpha=0.05$.

Table 2

Response on efficiency and successful of legislation and forest management for the sustainable forest management in Lower Kinabatangan (n=115)

Response on efficiency of forest legislation and management	Mean response for each group				F - value	p - value
	Governm ent (n = 48)	Private sector (n = 35)	Local communit y (n = 32)	Grand mean (n = 115)		

Efficiency of forest management and planning	3.2	2.6	2.6	2.8	6.2	.001***
Efficiency of forest protection strategies	2.7	2.5	2.4	2.5	2.1	.111
Legislation and policy to SFM	4.0	3.5	3.3	3.6	11.2	.000***

5-Point Scale (1= strongly disagree; 3 = neither disagree nor agree; 5= strongly agree)
 ***Significant at 0.01

Respondent Perception on Factor Constraints of Forest Management Progress in Lower Kinabatangan.

These sections were showing the result about the respondent perception regarding the constraint or barrier in the forest management in Lower Kinabatangan. In this context to investigate what factors generally restraint the progress towards forest management in Lower Kinabatangan, all respondents were given a series of questions and must show their levels of agreement or disagreement. From the Figure 7, it shows that all respondent agreed that all the issue regarding forest management become a factor that restraint the process for achieving sustainable forest management in Lower Kinabatangan with exception of the unsustainable used of forest resources (biodiversity). Furthermore, from the result also shows that top priority was given by all respondents in term of incompetent forest management, forest conversion to other land uses and illegal land use activities as the major factors blocking sustainable forest management process in Lower Kinabatangan.

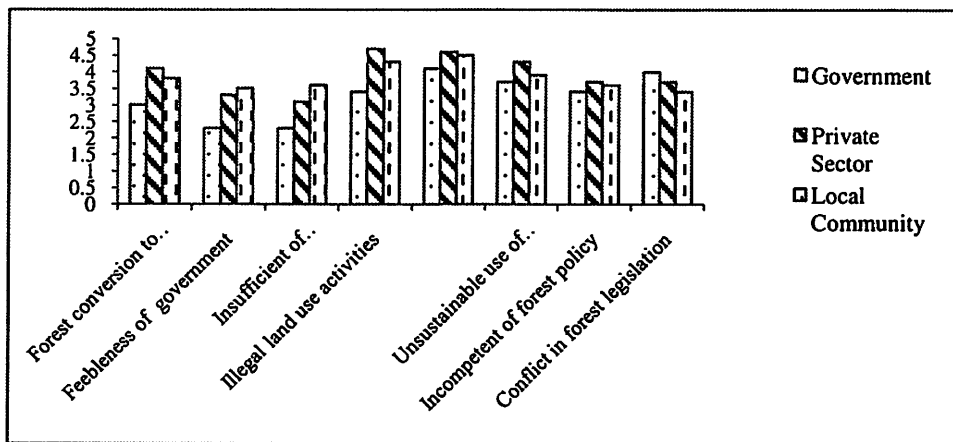


Figure 7
 Response on factor constraint to forest sustainability process in Lower Kinabatangan (n=115)

For further analysis, an ANOVA test was used to see whether there are any significant differences between the responses from the three groups of respondent. As shown in Table 3, most of the factor were significant at $\alpha=0.05$, with exception of the factors of unsustainable use of forest resources (biodiversity) in Lower Kinabatangan.

Table 3
Response on factor constraint to forest management process in Lower Kinabatangan (n=115)
Mean response for each group

Response on constraint to forest management	Government (n = 48)	Private sector and NGOs (n = 35)	Local community (n = 32)	Grand mean (n = 115)	F - value	p - value
Forest conversion to other land uses	3.0	4.1	3.8	3.6	8.9	.001** *
Feebleness of government	2.3	3.3	3.5	3.0	15.9	.000** *
Insufficient of enforcement laws	2.3	3.1	3.6	3.0	14.2	.001** *
Illegal land use activities	3.5	4.7	4.3	4.2	11.2	.001** *
Incompetent of forest management	4.1	4.6	4.5	4.4	3.1	.044**
Unsustainable use of forest resources	3.7	4.3	3.9	3.9	1.9	.112
Incompetent of forest policy	3.4	3.7	3.6	3.6	1.4	.271
Conflict in forest legislation	4.0	3.7	3.4	3.7	11.2	.000** *

***Significant at 0.01

5-Point Scale (1= strongly disagree; 3 = neither disagree nor agree; 5= strongly agree)

Respondent Perception on Sectors of Lower Kinabatangan Forestry That Require Reform

Sustainable forest management can be achieving if all sector in the Lower Kinabatangan forestry contribute in the process of forest management in the maximum level. However, insufficient and ineffectiveness of some sector has to reform to make the forest management more sustainability. In order to assess which aspects of forestry in Lower Kinabatangan should be reformed to ensure that the sector makes the maximum sustained contribution to the sustainable forest management; respondents

were given six areas of the forest sector to indicate their level of agreement or disagreement for reforms. From the result in Figure 8, shows that all respondents agreed that all sector in forestry has to reform but among the sector, better legislation, enforcement of law and policy and forest management and planning strategies reform stated the highest agreement from all respondents.

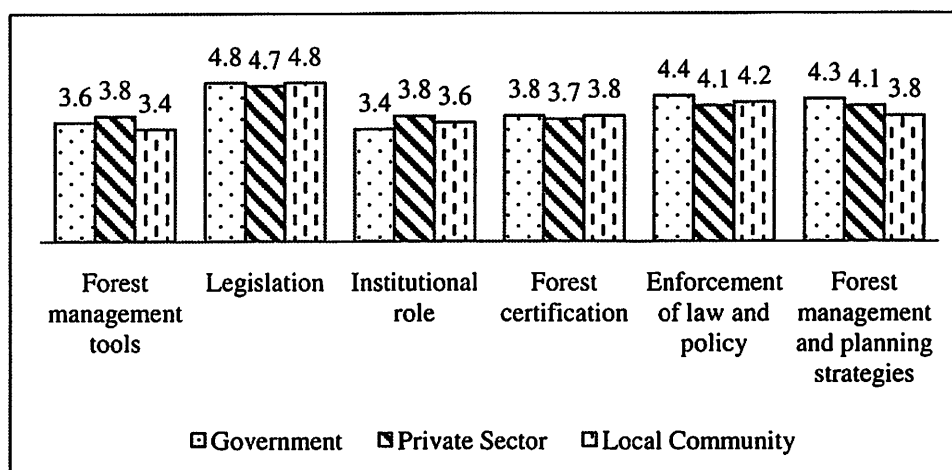


Figure 8
Response on sector in Lower Kinabatangan forestry requires reform (n=115)

For further analysis, ANOVA test was used to identify differences in mean response in responses from the three groups of respondent. From the result in Table 4, it shows that only institutional role reforms (p-value 0.041) and forest management and planning strategies reform (p-value 0.018) were significant at $\alpha=0.05$.

Table 4
Response on reforms required in the forest sector for achieving sustainable forest management in Lower Kinabatangan (n=115)

Response on reform in forest sector	Mean response for each group				F-value	p-value
	Government (n = 48)	Private sector and NGOs (n = 35)	Local community (n = 32)	Grand mean (n = 115)		
Forest management tools	3.6	3.8	3.4	3.6	2.9	.067
Legislation	4.8	4.7	4.8	4.8	.55	.588
Institutional role	3.4	3.8	3.6	3.6	3.3	.041*

	3.8	3.7	3.8	3.8	.04	.983
Forest certification						
Enforcement of law and policy	4.4	4.1	4.2	4.2	7.0	.490
Forest management and planning strategies	4.3	4.1	3.8	4.1	4.2	.018*

***Significant at 0.01

5-Point Scale (1= strongly disagree; 3 = neither disagree nor agree; 5= strongly agree)

Overall, the result from the analysis of this study found that all major stakeholders have similar views and also fully support any action on environmental issues in the Lower Kinabatangan. They also argue that the Lower Kinabatangan have a weakness in forest management system in terms of policy and law. However, it can be improved with the cooperation of all stakeholders to enhance the capacity for achieving sustainable forest management.

CONCLUSION

In conclusion of this result of empirical analysis, one of the lessons learnt from this study is based on the fact that this analysis has confirmed the theoretical setting concerning the forest management and planning participant stakeholders to be involved in a sustainability forest planning process. In this context, sustainable forest management process in Lower Kinabatangan should involve all stakeholders (Government (G), Private Sector and NGOs (PS) and Local Community (LC). They have to be integrated in an equitable way for each step of the forest planning process, the implementation of the outcome, and specifically the sharing of benefits gained from the resources in order to successfully achieve sustainable forest management in Lower Kinabatangan.

REFERENCES

- Bartlett, J. E., Kotrlik, J. W. and Higgins, C. (2001). Organizational research: Determining appropriate sample size for survey research. Journal of Information Technology, Learning, and Performance. Vol.19(1), pp. 43–50.
- Gallagher, T.J and Patrick-Riley, K. (1989) The Readability of Federal Land Management Plans. Journal of Environmental Management. Vol. 13(1), pp. 85-90
- Hoh and Ishak (2001). Oil Palm Cultivation in the Lower Kinabatangan Floodplains: A Case Study. Paper presented at the Forum on Making Land Use Sustainable in the Lower Kinabatangan Floodplain, Kota Kinabalu, April, 2001
- Jenkins, M.D. and Groombridge, B. (2007). World Atlas of Biodiversity: Earth's Living Resources in the 21st Century. World Conservation Monitoring Centre, United Nations Environment Programme
- Koh, L.P. and Wilcove, D.S. (2007). Cashing in palm oil for conservation. Journal of Nature. Vol. 448, pp 993–994.
- Mannan, S. and Awang, Y. (1997). Sustainable forest management in Sabah. Proceedings Seminar on Sustainable Forest Management. Vol. 27, November 1997, Kota Kinabalu, Sabah, organised

by Sabah Forest Department, pp. 51-74.

Payne, J. (1997). The Kinabatangan Floodplain: An introduction. WWF Malaysia.

Sabah Forestry Department. (2007a) Forest Legislation. Retrieved July 10, 2010 From <http://www.forest.sabah.gov.my/policies/legislation.asp167>

WWF Malaysia (2004) Kinabatangan A Corridor of Life. Brochure for Partners for Wetlands Project.

WWF Malaysia (2005) Kinabatangan Flood Plain Forest Conservation Project - Phase III (July 2005-June 2007)

Yamane, T. (1967). Elementary Sampling Theory. Englewood Cliffs, Prentice Hall: New Jersey

ANALYSIS OF RESIDENTIAL LOCATION OF ICT SECTOR EMPLOYEES IN A LIVEABLE CITY – A CASE OF KUALA LUMPUR, MALAYSIA

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ABSTRACT

Employment and residential location are interconnected in urban areas. The residential land use within a city and its surrounding areas are highly influenced by the employment provision in the city. In order to understand the internal dynamics between location of employment and housing, it is important to identify and analyze the various factors which influence the residential location choice. Understanding of these factors is important to determine the future physical form of the cities, transport policies and other development policies. With the above background, this paper attempts to study the residential location choice of Information Technology and Communication (ICT) sector employees in Kuala Lumpur City. The study examines the various factors and the extent to which these factors influence the residential location. The study intends to provide an understanding of residential location factors of ICT sector employees in Kuala Lumpur and a basis for further empirical research. Findings from this are expected to assist in land use planning, housing and infrastructure policies formulation and also to provide a general idea of future housing demand for the private developers and other relevant agencies.

Key Words: Residential location choice, Residential land use, Information communication and technology (ICT) sector employees, Kuala Lumpur City, Commute cost, Rent.

INTRODUCTION

Kuala Lumpur, the capital city of Malaysia, has been ranked 79 out of 130 cities under the Economist Intelligence Unit survey on liveability in 2010. In order to address the liveability issues such as to combat crime and improve urban public transport, major initiatives have been undertaken by the Federal and City government, to create a distinctive urban character of KL City, and to make it an ideal place to live, and work. Nevertheless, a major concern has been expressed about the city's residential land use structure and the forces that shape up its residential land use structure. How different sectors of the city economy contribute to determine the city's residential land use, has remained largely unexplored. Therefore, Kuala Lumpur City's initiative towards livability and K-economy should be based on ICT sector employees choice of residential location which will guide future development of the city.

Studies on residential choice environment in Malaysia are mostly focused on land use and housing. There is no study on the factors influencing the residential location of ICT employees working in KL, but there is a study about teleworking of ICT employees in KL, which could provide some insights

into the issue. Moreover, there is a lack of studies to identify and explain these factors to determine future form and development of cities. The existing studies on residential location choice in other places consider the two factors of friction and distance from the workplace and rent (Alonso, 1964, Muth, 1969). Other studies focus on variables or factors of the size of the housing unit as a determining factor of the residential location as manifested on the access-space trade-off model (Mootaz, 2007). In both cases, modern location theories cast the economic behaviour of households in a competitive neo-classical context with the consumer being viewed as a utility maximizing price maker (Maclennan, 1982). Although there are certain truths about such assumptions, it is clear that there may be other factors influencing residential location or the converse may also vary by household relationship, tenure, ethnicity and socio-economic status (Waddell, 1997). Location theories are limited by the difficulties of quantifying and identifying factors that potentially influence the residential location (Maclennan, 1982), such factors include distribution of urban services, social values, status, ethnicity and others.

AIM, OBJECTIVES AND RESEARCH QUESTIONS

The aim of the study is to explain the residential location of ICT employees through examining the relationship between housing, commute characteristics and socio-economic factors.

Objectives

- A. To study the socio-economic, housing and commute characteristics of ICT employees.
- B. To investigate the relationship among housing, socio-economic, commute characteristics of the ICT employees.
- C. To explore the nature and significance of the relationship between identified factors and the choice of residential location.

Research questions

- A. What is the existing residential location pattern of ICT employees working in KL?
- B. What are the demographic and socio-economic attributes of the employees?
- C. What is the expenditure pattern of the households on housing?
- D. What are the transportation parameters affecting the employees residential location?
- E. What are the factors, and to what extent do they determine the residential location of the households/employees?

LITERATURE REVIEW

Studies on urban land use are comprehensive, and these include contributions from all the disciplines which conventionally fall within the social science category (Carter, 1974). Various attempts have been made to describe urban land use pattern and the underlying process, which generated those patterns since the beginning of 20th century. Initially, these attempts were mere descriptions of observed land use patterns by various researchers. Underlying processes that generated those patterns were merely hypothesized and were not empirically tested. Later attempts were made to understand the processes in terms of both economic and non-economic behavior of both spatial and non-spatial entities in urban space. In short, the literature about the relationship between employment and residential location can be divided into four parts. These are –

- a) Descriptive urban land use models.

- b) Process based economic and econometric models.
- c) Process based non-economic models.
- d) Empirical studies.

Descriptive urban land use models

Three descriptive spatial models – concentric zone model of Burgess (1925), sector model of Hyot (1939) and multiple nuclei model of Harris and Ullman (1945), described the spatial growth and land use distribution pattern of major US cities of that era. These models were developed to generalize the patterns of urban land use found in early industrial cities of the US (Chapin, 1970). These were general models devised to understand the overall patterns of land use; none of them can accurately describe patterns of urban land use in all cities. In fact, all of these models are criticized for being applicable to cities in US than to other cities. Further, these models are criticized because they are static; they describe urban land use patterns in a generic city, but do not describe the process by which land use changes occur.

Economic and econometric models

After the original formulations of the monocentric agricultural land use theory, many monocentric economic land use models (Alonso, 1964; Muth, 1969; Mills, 1976), began to emerge in urban economics literature. These models are based on the assumption that the activity with the highest bid (rent) for any parcel of land would occupy that land, leading to an orderly arrangement of activities according to the various bid curves, with the curves related to the production function of the activity and the cost of transporting the goods to the market. In applying this agricultural theory to urban economics, the market is taken as the CBD where all jobs are concentrated.

In traditional econometric models, it was difficult to consider the effect of the policies such as land tax system, which works on the economic entity's behaviour. It became necessary to develop land use models based on the behaviour/ choice of the economic actors. It proceeded with the application of the random utility model developed by McFadden in the field of traffic demand prediction in the 1980s (Miyamoto et al., 1989). Hence, random bid rent models were developed to capture the competition between different locators for one land lot (Miyamoto et al., 1989). Later, Landis (1995) proposed his famous California Urban Future (CUF) model using discrete choice approach to model development and redevelopment in an urban setting, which was spatially explicit and spatially disaggregate land use change model.

Non-economic models

Geographers and natural scientists developed various spatially explicit non-economic models of land use change. Cellular Automata (CA) are a class of mathematical models in which the behaviour of a system is generated by a set of deterministic or probabilistic rules that determine the discrete state of a cell based on the states of neighbouring cells. Lowrey's Model of Metropolis, developed in 1960s, is based on the assumption that the place of basic employment determines the place of residence, is considered a pioneer (Echenque et al, 1990). Disaggregated Residential Allocation Model (DRAM) and the Employment Allocation Model (EMPAL) are most widely applied to determine housing or employment allocations to various destination zones. The METROSIM model developed by Annas (1994) embodies a discrete choice method with economically specified behaviour and a market clearing mechanism. UrbanSim (Waddel et al., 2001) based on GIS technology, takes two key inputs from the external model system, a macroeconomic model to predict future macroeconomic condition such as population and employment by sector and a travel demand model system to predict travel conditions -

congested times and composite utilities of travel between zones.

Geographers and natural scientists developed numerous spatially explicit cell based empirical models with the advent of GIS and remote sensing based technologies (Anderson and Souleyrette, 1996; Batty et al., 1989; Berry et al., 1996; Clarke et al., 1997). Several Hybrid models, such as LUCAS model, CLUE model, were developed, and these models use the parameters from the econometric model to predict the spatial pattern of land use/ cover change that could occur under different exogenously imposed scenarios.

Empirical Studies

There is a wide range of empirical studies on factors determining residential location. Linneman and Graves (1983) argue that residential decisions and job search are intimately intertwined over both short and long distance. Weinberg (1979) observed that individuals can adjust accessibility by adjusting workplace location or residential location or both. However individuals do not make simultaneous decision regarding their residence and workplace (Gordon and Vickerman, 1982), some individuals will make workplace decisions based on the basis of predetermined residential location while others do it vice versa. Beesley and Dalvi (1974) argued that residential choice is primarily the decision of the household head, with the likely implication that secondary workers in the household choose their workplace on the basis of a predetermined residential location. Compared to renters, home owners incur higher relocation cost, and home owners are likely to choose their residential location based on workplace. Educated workers adopt a large job search radius, confirming that higher socio-economic status confers greater flexibility in the choice of both residential and workplace location (Schwartz, 1973). Smersh (2003) explored the role of transport, large-scale development, employment nodes, existing patterns of development and regulation on the spatial pattern of the residential development in Alachua County in Florida, USA. Wan Nurul Mardia (2005) studied residential location of ICT sector employees of Kuala Lumpur in her teleworking perception study. Mohit and Mootaz, (2010) studied the residential location of IIUM employees and found variables such as monthly commute cost, type of transport used, employment in the family, house tenure and duration of job as predictors to the dependent variable which was commute distance between residence and workplace.

All the reviewed models including the empirical studies are very useful tools for decision support system in urban land use policy. The individual parcel of land obtains a value and is priced in the market and this cannot be separated from the aggregate view of all the parcels and how their values are established. It is useful to view the structure of land values as a whole and examine the relationships between land values and land uses in an aggregated way. The models reviewed deal with mainly physical, structural and economic aspects of urban land use. However, there are a host of socio-culturally rooted determinants of urban land uses, human behaviours, commuting elastic population of urban-rural fringe areas, all of which exert some influences on the location and arrangement of land use in urban areas.

RESEARCH METHODOLOGY AND THE STUDY AREA

The methodology adopted for the current study includes – (a) formulation and administration of the questionnaire for the household survey, (b) the sampling frame, (c) methods of data analysis, and (d) selection of the study area.

Formulation and administration of the questionnaire

A close-ended questionnaire was developed based on the information gathered from the literature survey. The questionnaire is divided into three sections – socioeconomic attributes of the

respondents, housing characteristics of the respondents and commute characteristics of the respondents. Variables included in section one are - respondent's gender, age, marital status, level of education, type of employment, years of service, average monthly income, location of spouse workplace, school going children and school distance from the house. The housing characteristics section includes information on respondent's type of house ownership, type and location of the house, market value of house, monthly house rent, amount of bank loan payment, reasons for choosing the current residential location, who selected location and lastly, the distance of important facilities from the residential location. Travel characteristics section includes - respondent's travel time to and from work, mode of transport used, commute cost, parking cost, satisfaction with commute distance and preferred commute distance. The questionnaire was pre-tested and then administered in the CBD area of KL City where most of the ICT offices are located.

The sampling frame

Total number of employees working in the ICT sector of Kuala Lumpur was identified from secondary information. Then the ICT employees were categorized into sub-sectors within the ICT employment for determining the sample by random sampling method. The sample size is calculated by using Yamane (1967). By using a 90% confidence level, which means that in 90 out of 100 repetitions of the survey, the result will not vary by more than $\pm 5\%$, a total of 200 ICT employees was selected for the questionnaire survey.

Methods of data analysis

Both descriptive and inferential methods of data analysis were used for the study. Descriptive analysis help to portray the situation while inferential analysis help in the reliability and prediction of analysis.

Selection of the study area

Kuala Lumpur City and its commute region which is generally known as Greater Kuala Lumpur area was selected for the study. The reason being that ICT employees, although they work in the CBD area of KL City, many of them live in the surrounding municipalities due to rental differences and availability of public facilities.

Study area – Kuala Lumpur City and Its Commute Region

Kuala Lumpur City, located in the middle of Peninsular Malaysia, is the capital of Malaysia. According to Economic Intelligence Unit, Kuala Lumpur City ranks 79 out of 130, as a liveable city in the world. The city is encircled by six municipalities which is the commute zone of the employees working in the city. A majority of surveyed respondents of this study has their workplaces located within Kuala Lumpur, and almost all of the ICT offices are located in the Kuala Lumpur city centre. Furthermore, the respondents' residential location being scattered to the surrounding commute areas of Kuala Lumpur, a brief background and important highlights of the Greater Kuala Lumpur are necessary.

Kuala Lumpur City has a land area of 243 square kilometres which consist of a variety of land uses and the residential land use is the dominant one. The city's population was 1.7 million in 2010, with a population density of 6,891 persons per square kilometres while the national density was 86 persons per square kilometres (Department of Statistics Malaysia, 2010). The population composition of Kuala Lumpur is 52.9% male and 47.1% female. Ethnic composition is - Malay 41.3%, Chinese 38.3%, Indian 9.8%, others 1.2%, non-Malaysian 9.3%. Kuala Lumpur being the commercial hub of

Malaysia contributes 10% to the Gross domestic product (GDP) of Malaysia. Per capita GDP at current prices was RM 55,951 (2010). The city had a labour force of 0.7 million people with labour force participation rate of 66.5% and an unemployment rate of 2.7% (2010). Over the years Kuala Lumpur has undergone a period of rapid economic growth that has significantly affected the travel demand in the metropolitan area of Kuala Lumpur which is the Greater Kuala Lumpur. According to the Kuala Lumpur State Structure Plan, the city authority (DBKL) envisions to transform Kuala Lumpur City into a "World Class City". To attain this goal, four main strategies have been adopted. These are – (a) a world class working environment, (b) a world-class living environment, (c) a world-class business environment, and (d) a world-class governance.

Greater Kuala Lumpur (Greater KL) comprises of the national capital of Kuala Lumpur and its surrounding satellite cities which includes, Putrajaya, Klang, Kajang, Subang Jaya, Selayang, Shah Alam, Ampang Jaya and Sepang (refer to Fig.1). The population of Greater KL in 2010 was six million. Being close to the capital, many people working in Kuala Lumpur reside in Greater KL areas. They reside for reasons that are highlighted in the analysis of this research. Today, Greater KL is an important economic growth cluster, contributing 8 times the GDP of any other city in Malaysia. Greater KL is well-positioned to become a national growth node, and a gateway towards developing a global economy, leveraging upon its strengths of a cosmopolitan population, a uniquely Asian heritage and strong world-class infrastructure.

ICT Sector in Malaysia

ICT sector is one of the world's fastest growing sectors, and the same trend prevails in Malaysia and the city of Kuala Lumpur. Kuala Lumpur is moving towards a knowledge base city as a result ICT sector becomes the most important sector in the city. According to a Survey by the Department of Statistics Malaysia (2007), the ICT sector belonged to the services industry, and there were 1,450 businesses operating at the end of December 2007. The value of output generated by these businesses was RM52.1 billion, with a growth of 10.0 per cent, after expanding 13.3 per cent in 2006. This sector covered computer services such as software consultancy and supply services; hardware consultancy services; data processing; data base activities and maintenance and repair of office, accounting and computing machinery. Telecommunication services meanwhile refer to telephone services; television & radio transmission services and data communication services.

Growth in the computer services industry was 21.3 per cent and in telecommunication services, 6.6 per cent in 2007. The main drivers to the expansion in the computer services were hardware consultancy, RM2.9 billion or 55.1 per cent increase and software consultancy and supply services, RM7.3 billion or 12.1 per cent increase. As for telecommunication services, data communication services posted RM8.5 billion or 20.0 per cent increase and television & radio transmission services, RM3.2 billion or 13.4 per cent. In 2007, employment in the ICT industry showed an increasing trend with 91,660 persons (10.2 per cent) as compared to 83,159 persons employed in 2006. Employment in computer services increased to 47,357 persons (21.0 per cent) as compared to 39,146 persons employed in 2006, and employment in telecommunication services increased marginally by 0.7%, that is 44,303 persons in 2007 as compared to 44,013 persons in 2006. The present study covers the ICT sector employees in Kuala Lumpur listed under MSC Malaysia, which is the Malaysia's national ICT initiative, designed to attract world-class technology companies and grooming local ICT industry companies to become world-class organizations. With full support from the Malaysian Government, MSC Malaysia has contributed to the nation's transformation towards a K-Economy for the past one and half decades.

RESULTS AND DISCUSSION

Based on the survey data analysis, the results of the study have been documented under the following five sections:

Demographic and socioeconomic characteristics

From the questionnaire survey, it was found that the ICT sector in Kuala Lumpur is dominated by the Chinese (47%), followed by the Malays (43%), Indians and others constitute 10% of the total. The age distribution of the respondents revealed that the employees of this sector are relatively young (< 25 years of age) who constitute 66% of the total work force. The employment categories within the sector indicate that it is dominated by technical/professional group (32%), followed by those who are in the public relations and customer services (22%), managerial/administrative group (15%) and marketing (15%), clerical/ secretarial (11%), research/ consultancy (5%). It was also found that most of the degree, postgraduate and diploma holders work in the professional/technical sections, whereas those with SPM or STPM work in the public relation/ customer services and those with SRP/LCE level work in the clerical/secretariat level. It was found that a majority of employees (64%) work in the sector between 1-5 years, followed by 30% who are working for less than 1 year and 5% are working for 6-10 years. A majority of employees (58%) earns between RM1000-2000, followed by 35% who earn between RM2001-5000 and only 7% earn between RM5001-10000.

Many socio-economic characteristics appear to influence residential location. Employees gross monthly income had a significant but negative correlation with residential location. This means the higher the income the nearer the employee intends to live near to their workplace. Chi-square test shows that the marital status and length of service exert significant influences on the residential location. Further, being the family head also had an influence on residential location. Therefore, this result goes along the descriptive land use models, represented by the urban ecologist, and the neo-classical economic land use models, which state that the socioeconomic status of the household and particularly, its income plays a major role in the location of the workplace of the head of the household (Mootaz, 2008).

ICT sector employees residential location environment

ICT sector employees residential location environment has been studied from three main perspectives. These are –

- A. Distance between employees place of residence and workplace.
- B. Employees' commute time between residence and workplace.
- C. Employees' daily commute cost between residence and workplace.

Distance between place of residence and workplace

The mean physical distance between residence and workplace is estimated at 15 km (Table 1). From Fig.1, it can be seen that 54 respondents live within a radius of 5 km while 101 respondents live between 5 to 10 km radius and 47 employees live between 10 to 15 km radius of Kuala Lumpur city centre. Employees spouse's workplace location (mean distance is 9.5 km), and the location of their children's school (mean distance is 9.7 km) are also shown in Fig.1, vis-a-vis their residential locations.

Commute time between place of residence and workplace

For the 202 employees, time to reach workplace and back to homes ranges between 3

to 120 minutes with a mean of 21.05 minutes from home to the workplace and 21.9 minutes from workplace to home. From Table 1, it appears that 91 (44.8%) of employees commute 11-20 minutes from home to workplace, followed by 48 (23.8%) who commute 21-30 minutes, and 43 (21.0%) who commute up to 10 minutes, and the rest 16 (8.0%) commute more than 30 minutes. A similar trend prevails for commute time from workplace to home with a few minutes of added delay times.

Monthly commute cost between place of residence and workplace

Commute costs include daily expenses on commute which includes fuel cost, toll for car users and actual fares for bus and train commuters. The mean daily commute cost for ICT employees was calculated at RM7.40 with a median of RM8.0 and a mode of RM10.0. The employees spending less than RM5.0 are public transport users who constitute 36.6% of the total, followed by 52.5% who spend RM6-10 are mixed mode users while 10.9% use more than RM10.0, and they are basically private transport users.

Table 1

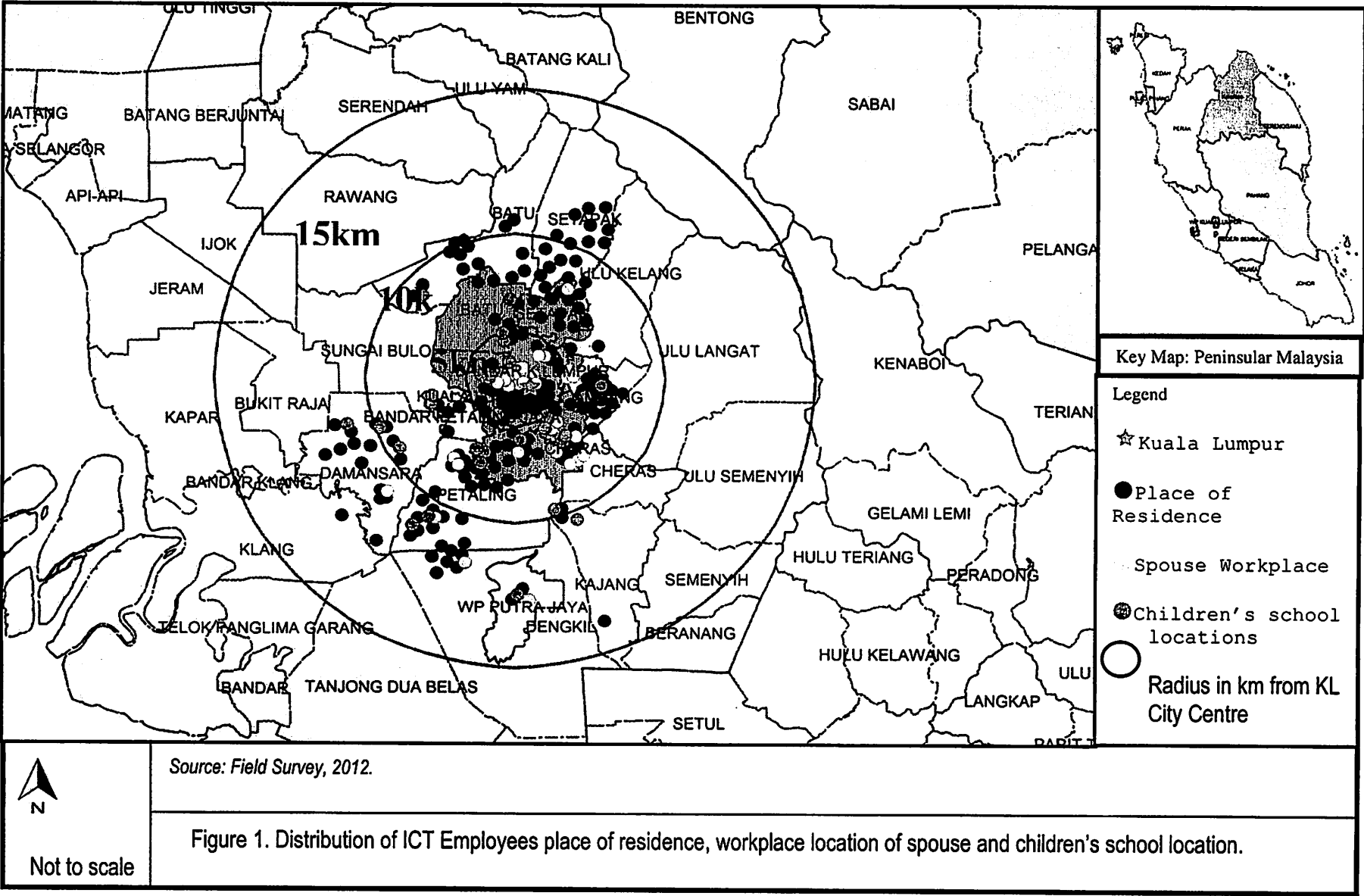
Commute time from home to the workplace and from the workplace to home.

Commute time from home to workplace			Commute time from home to workplace			Average	
Minutes	Frequency	%	Minutes	Frequency	%	Frequency	%
Up to 10	45	22.28	Upto 10	40	19.80	42.5	21.04
11-20	91	45.05	11-20	90	44.55	90.5	44.80
21-30	46	22.77	21-30	50	24.75	48	23.76
31-45	14	6.93	31-45	16	7.92	15	7.43
46-60	5	2.48	46-60	5	2.48	5	2.48
61 >	1	0.50	61-120	1	0.50	1	0.50
Total	202	100		202	100	202	100
Mean	21.04	-	Mean	21.88	-	-	-
SD	12.966	-	St. deviation	12.195	-	-	-

Source: Field Survey, 2012.

Housing characteristics and residential location

The survey results show that 133 (65.8%) employees are living in residences or houses, either with friends or parents while 27 (13.4%) are sole renters. Only 42 (20.8%) of the employees own houses, of which 3 (1.5%) have inherited their houses.



While 49 (24.3%) employees live in apartments, 48 (23.8%) are living in condominiums. Whereas 53 (26.2%) employees live in single-storey terrace, 43 (21.3%) live in double-storey terrace houses. Only 4 (2.0%) live in bungalows, 3 (1.5%) live in semi-detached, and 2 (1.0%) in Kampung houses. The average period of stay at current houses is 9.5 years with a median of 8 years and a mode of 10 years. 23 (11.4%) employees live in their current residences for less than a year, 66 (32.7%) live between 1 to 5 years, 47 (23.3%) each for 5-10 years and 10-20 years, respectively while 19 (9.4%) are living in their present residences for more than 20 years.

It was found that 134 (66.3%) employees are paying rent for their houses. The mean rent is RM476 with a mode of RM300 and a median of RM400. House rentals varied from RM100 to RM2000, due to many who share rents with others. Only 18 (13.4%) employees pay rent above RM700, and the rest 116 (86.6%) share houses with others. Among the rent paying employees, 65 (48.5%) pay 3-5% of their incomes as rent, 49 (36%) pay 5-20% of their income as rent, and only 20 (14.9%) pay 1-3% of their incomes as rent.

It was also found that 70 (34.7%) employees pay back their house loans while the rest 130 (64.4%) do not have any housing loans. The loan amount varies from RM180 to RM1300 with a mean of RM471, a median of RM350 and a mode of RM200. It can be assumed that whereas lower amounts of loans are for the car or other commodities, higher amount of loans are housing loans.

The survey results show that only 39 (19.6%) employees own houses and 36 (17.8%) provided information on market value of their houses which varied from RM100,000 to RM5,000,000. The mean value calculated is RM767,778, with a median and a mode of RM300,000. The lower prices are for apartments and the higher prices are for semi-detached and bungalow houses.

Among the 7 reasons provided for living in the present residence, 125 (61.9%) employees expressed views to live with their families followed by 61 (30.2%) who considered their current residence near to their workplace. 56 (27.7%) considered their residences as cheap housing, 43 (21.3%) because of good community facilities, 35 (17.3) because of friendly neighborhood, 32 (15.8%) for public transport, 26 (12.9) for spacious and quality housing, and 2 (1.0%) for other reasons.

As many employees (107 or 53%) are living with their parents, their residential location was selected by their parents. For others, 50 (24.8%) of them selected housing locations by themselves, followed by 26 (12.9%) whose spouse selected location and only 17 (8.4%) whose houses were chosen by their friends.

The accessibility to essential facilities such as shopping complex, primary school, banks, parks, train station and bus stops within or nearer to a residential area play an important role in the selection of housing. Based on the survey, it was found that respondents live at a mean distance of 4.4 km from the nearest shopping complex, with a median of 3 km and a mode of 5 km. Out of the 202 respondents, 118 (59%) of them live within 1.1-5 km, followed by 41 (20.5%) respondents who live within 5.1-10 km, 35 (17.5%) respondents live less than 1 km, and lastly, 6 (3%) of the respondent live 10.1-25 km from the shopping complexes.

The mean distance from the nearest primary school is 2.5 km, with a median of 2 km and a mode of 1 km. More than half of the respondents (115 or 64.2%) live within 1.1-5 km away from the nearest primary school, followed by 33 (18.4%) respondents within 5.1-10 km, 26 (14.5%) respondents live within less than 1 km and only 5 (2.8%) respondents live within 10.1-25 km away from the nearest primary school. Most of the respondents live close to banks with a mean of 3.98 km, a median of 3 km and a mode of 5 km. A large number of respondents 118 (59.9%) live within 1.1-5 km away from the

nearest bank while 77 (39.1%) respondents live within 1 km from the bank, and only 2 (1%) respondents live within 5.1-10 km far from the bank.

Most residential areas are facilitated with neighbourhood parks or play lots for the children. Therefore, the locations of parks are very close to the residential areas, with a mean of 1.5 km, a median and a mode of 1 km. Around three quarters of the respondents, 142 (71.4%) live within 1 km from the nearest park and 53 (26.6%) respondents within 1.1-5 km from the park, and only 2 (1%) lives 5.1-10 km from the park and similarly only 2 (1%) of the respondents live within 10.1-25 km from the park.

Table 2

Distance of the facilities from the employees residences.

	Distance from shopping complex		Distance from primary school		Distance from Bank		Distance from Park		Distance from Train station		Distance from Bus stop	
Mean	4.42 km		2.53 km		3.98 km		1.49 km		3.20 km		.70 km	
Median	3.00 km		2.00 km		3.00 km		1.00 km		2.00 km		.50 km	
Mode	5.00 km		1.00 km		5.00 km		1.00 km		1.00 km		.50 km	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
0-1 km	35	17.5	26	14.5	77	39.1	142	71.4	78	39.6	186	93.5
1.1-5 km	118	59	115	64.2	118	59.9	53	26.6	72	36.5	13	6.5
5.1-10 km	41	20.5	33	18.4	2	1.0	2	1.0	31	15.7	0	0.0
10.1-25 km	6	3	5	2.8	0	0.0	2	1.0	16	8.1	0	0.00
	200	100	179	100	197	100.0	199	100	197	100	199	100.0

Source: Field Survey, 2012.

As many of the respondents are using public transport, especially train to commute to their workplace, the analysis of distance of the train station from the residence is important. The mean distance from the nearest train station is 3.2km, with a median of 2km and a mode of 1km. 78 (39.6%) of respondents live within less than 1 km, followed by 72 (36.5%) of respondents who live within 1.1-5 km from the train station while 31 (15.7%) respondents live within 5.1-10 km, and only 16 (8.1%) respondents live within 10.1-25km from the train station, respectively.

Among all the facilities bus stops are the nearest stated facility among the respondents with a mean distance of 0.7km and a median and a mode of 0.5km from the bus stop. More than 3 quarters, or 186 (93.5%) respondents live within less than 1 km from the bus stop, and the rest of 13 (6.5%) respondents live within 1.1-5 km of the bus stop.

Unlike socio-economic characteristics, only a few of the housing characteristics had influence on the employees residential location. The influential factors are - house ownership, type of house, the number of years at the current residence, and location of facilities. On the other hand, some important factors such as rent, market price of the house and monthly bank loan installments showed no significant correlation.

Commute characteristics and residential location

The survey finding shows that out of 202 employees, only 32 have a working spouse. The location of spouse's workplace is shown in Fig.1. The mean commute time of spouses from home to their workplace is calculated at 13 minutes, with a median and a mode of 10 minutes, respectively. Similarly, 19 (9.4%) employees reported having a total of 32 school going children at 24 different schools. The mean distance travelled by the children to their school is 9.7 km, with a median of 10 km and a mode of 9 km. Among the parents, 40.6% live within 5-10 km from the school, followed by 15.6% parents who live within 1-3 km from the school and 18.8% live within 1 km from the school. From the 32 employees with school going children, only 27 reported about the mode of transport used to go to school. Whereas 20 (74.1%) of the school children are dropped by using car, 5 (18.5%) of school children go to school by bus and only 2 (7.4%) of the children walk to their school.

It was found from survey that among the 202 respondents, 195 expressed their satisfaction with the commute and the residential location. Out of the 195 respondents, 90 (46%) are moderately satisfied with the commute distance to workplace while 66 (34%) are just satisfied with the commute distance, and 7 (4%) are very satisfied with the commute distance. 32 (16%) of the respondents stated as dissatisfied, and 4 (2%) of the respondent stated as very dissatisfied. On the whole, 83.6% of the respondents are satisfied while only 16.4% of the respondents are dissatisfied with the commute distance.

Out of the 202 respondents, only 28 (13.9%) expressed their preferred distance between residence and workplace. Among the respondents who answered, the mean preferred distance to the workplace is 6 km, with a median and a mode of 5 km. Most of these respondents (20, 71.4%) prefer a distance of 5-7 km, followed by 6 (21.4%) who preferred a distance of 8-10 km and only 2 (7.1%) less than 5km distance from their workplace.

According to the mainstream location theory, the secondary (spouse) employment is never taken into consideration; however, it seemed to be a priority to the average household with multiple employments. As per the Chi-square test, the spouse location of the workplace has a strong association with the residential location. The employees tend to live nearer to their spouse workplace than their own because the mean commute time (21 minutes) of employees is higher than their spouse mean commute time (13 minutes). Similarly, school location tends to influence residential location because the mean distance between the house and workplace (15 km) is higher than the mean distance between residence and school (9.7 km).

Determinants of the residential location

A multiple-regression model was estimated, by using the stepwise method, for the purpose of statistically identifying the most influential factors that determine the residential location and also for predicting a respondent's residential location based on the independent variables. The regression model calculated is presented in Table 3. Seven variables account for 73.6% ($R^2 = 0.736$) of the variance for the distance between the respondents' place of residence and workplace. Therefore, the model can be considered as the most reliable model for predicting the residential location of ICT employees in Kuala Lumpur.

Distance (in minutes) between respondents place of residence and workplace (residential location) = - 6.118+ {0.787 (Distance of home from the nearest train station)} - {6.854 (Distance of home from the nearest bus stop)} + {4.252 (mode of transport used)} +{1.299 (Daily commute cost on fuel & tolls/bus

& train fare)} + {3.052 (Distance of home from the nearest neighborhood or play park)} - {2.533 (Distance of home from the nearest bank)} + {5.970 (If the respondent is the family head)}

It is important to highlight the contribution of individual independent (predictor) variable to the model remains very limited other than the reliable variable 'If the respondent is the family head'; this is considered as the strongest predictor for the residential location. However, the other predictor variables also add strength to the model; also it is important to highlight the duration of service at the current workplace, income, location of facilities in determining the residential location of ICT employees in Kuala Lumpur.

Table 3
Multiple Regression Model.

Model Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-6.118	5.132		-1.192	.242
Distance from the nearest train station	.787	.230	.506	3.426	.002
Distance from the nearest bus stop	-6.854	2.441	-.311	-2.808	.008
Mode of transport	4.252	.949	.453	4.482	.000
Daily commute cost on fuel & tolls/bus & train fare	1.299	.336	.459	3.870	.000
Distance from the nearest neighbourhood or play park	3.052	.705	.694	4.326	.000
Distance from the nearest bank	-2.533	.819	-.611	-3.090	.004
If the respondent is the family head	5.970	2.038	.272	2.930	.006
a. Dependent Variable: Time taken to reach workplace					
R ² = 0.736					

Source: Field Survey, 2012

CONCLUSION AND RECOMMENDATION

The study shows that in determining the residential location, rent and travel cost are not only the determinant, but many other factors contribute. The study findings provide partial support to the mainstream land use structure theories which postulate that economic concerns are the primary determinants of residential location.

The study, with the identification and analysis of factors, has shed some light on the issues of residential location, and provided an understanding of the factors influencing residential location of ICT sector employees in a liveable city. Through this understanding, the study embarks on the following recommends:

- A. Factors such as the position in the family, distance from certain important facilities, house ownership, number of the year at the current residence, are excluded from the many residential location analysis. Hence, it is recommended to incorporate these factors into residential location models.

- B. A large number of employees are private transport users, travelling quite far from the workplace and most of the unsatisfied commuters prefer 5-7 km distance from home to workplace. Therefore, while formulating land use and transport policies it is recommended to consider the location of housing within 5-7 km distance of the city centre.

REFERENCES

- Alonso, W. (1964). Location and land use. Massachusetts, USA: Harvard University Press.
- Anas, A. (1994). METROSIM, A unified economic model of transportation and land use. 1-15.
- Anderson, M.D. and Souleyrette, R.R. (1996). A GIS based transportation forecast model for use in smaller urban and rural areas. Transportation research record 1551. Washington DC: TRB.
- Burgess, E.W., (1925). The growth of the city: an introduction to a research project, in R. Parker, E. Burgess and R.D Mckenzie (eds.), City. University of Chicago Press, Chicago.
- Echenique, M.H., Flowerdew, A.D., Hunt, J.D., Mayo, T.R., Skidmore, I.J. and Simmonds, D.C. (1990). The MEPLAN models of Bilbo, Leeds and Dortmund, Transportation Review, 10, 309-22.
- Haque, S.M., & Mamun, S. M. M. (2006). An anatomy of urban land use and land price models. Jahangirnagar Planning Review, 4, 95-104.
- Hoyt, H. (1939). The structure and growth of residential neighbourhood in American cities. Washington, DC: US Government printing office.
- JPBD (Federal Department of Town and Country Planning) (2006). National Urbanisation Policy. JPBD, Kuala Lumpur, Malaysia.
- JPBD (Federal Department of Town and Country Planning) (2005). National Physical Plan. JPBD, Kuala Lumpur, Malaysia.
- Kaiser, J. E., David, R., Chapin, F., & Staurt, J. (1995). Urban land use planning. 4th Ed., USA: University of Illinois Press.
- Kivell, Philip, (1993) Land and the city: partners and processes of urban change. Routledge, London.
- Kuala Lumpur City Hall (2010). Structure Plan Kuala Lumpur 2020. 2010.
- MacLennan, Duncan (1982). Housing Economics. Longman Inc., New York.
- Malaysian Department of statistic (2011). Yearbook of Statistics Malaysia, 2010. Percetakan Nasional Berhad
- Malaysian Department of Statistics (2011). Economic Census 2011; Information and Communications Services. Retrieved on 15 July 2011, (www.statistics.gov.my/portal/images/.../BE2011_MaklumatBI.pdf)
- Malaysian (2010). Tenth Malaysia Plan, 2011-2015, Percetakan Nasional Berhad
- Mohammd A. Mohit & Mootaz M. Mustafa (2010). Analysis of Commute Characteristics and Residential Location Choice of IIUM Gombak Campus Employees of Malaysia. PLANNING MALAYSIA - Journal of the Malaysian Institute of Planners, 8, p. 25-43
- Mootaz Mohamed Mustafa. (2007). "A study of factors determining residential location of IIUM Employees, Malaysia". Master Thesis. Malaysia: Kulliyah of Architecture and Environmental Design, IIUM.
- Miyamoto, K. and Kitadume, K. (1989). A land use model based on random utility/rent-bidding analysis. RURBAN – Proceedings of the 5th World Conference on Transport Research, IV, 107-121.
- Multimedia Super Corridor: Location of MSC status companies. Retrieved on 1 April 2012, (<http://www.msomalaysia.my/topic/Status+Company/Status+Company>)

- Muth, R.F. (1969). *Cities and housing*. Chicago, USA: University of Chicago.
- Park, R., Burgess, E. W., & Mckenzie, R. D. (2005). *The City*. Chicago, IL: University of Chicago Press.
- Paul, A. W. (1997). *Housing choice and urban structure*. Aldershot: Ashgate Publishing Company.
- Richard J. Arnott, Daniel P. McMillen (2006). *A Companion to Urban Economics*. Blackwell Publishing, USA.
- Smerah, G.T. (2003). Factors affecting residential property development patterns. *The Journal of Real Estate Research*, 25(1), 61-76.
- Waddel, P., Boring, A., Noth, M., Freier, N., Becke, M. and Ulfarsson, G. (2001). UrbanSim: A Simulation System for Land Use and Transportation. Paper presented at 40th Annual Meeting of the Western Regional Science Association, Palm Springs, 25-28 Feb, 1-12.
- Wan Nurul Mardiah Bt. Wan Mohd. Rani (2005). *A perceptual Assessment Towards Telecommunication and Its Implication on Commute Travel*. Unpublished Master Thesis. Kulliyyaah of Architecture and Environmental Design, IIUM, Malaysia.

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HOMESTAY PROGRAMME PRACTICES IN LOCAL COMMUNITY: TOWARDS A CULTURALLY SUSTAINABLE LIVING

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ABSTRACT

The tourism industry is rapidly growing in Malaysia and becoming the second largest contributor to Malaysia's economy. In Malaysia, the Ministry of Tourism has introduced the programme in 1988 as an effort to vary the tourism sector through the provision of an alternative accommodation for the tourists. In the Seventh Malaysia Plan in early 1990's, the government took the initiative to upgrade and improve the sector of tourism. The government concerns that the growing of tourism activities will degrade the environment, society and decrease the value of cultural elements in the local community and daily lifestyle. However, there are few studies on the practices of Homestay Programme especially in maintaining the value of cultural landscapes and maintaining the cultural elements among local communities. This paper aims to discuss the cultural sustainability in Homestay programme, youth participation in homestay programme and followed by a discussion on the relationship between them. The paper argues that the Homestay programme can nurture local community's awareness on cultural knowledge in their daily lifestyle. This paper will discuss the gap between the previous research by description on how to educate the local community especially youths to participate in the Homestay programme.

Key Words: Homestay programme, local community, cultural sustainability, cultural elements

INTRODUCTION

Tourism industry is rapidly growing in Malaysia and becoming the second largest contributor to Malaysia's economy. In the Seventh Malaysia Plan in early 1990's, the government took the initiative to upgrade and improve the sector of tourism. Homestay Programme is a community based tourism that employs the local communities in the village area and promotes interaction between host families and tourists.

In Malaysia, the Ministry of Tourism has introduced the Homestay Programme as an effort to vary the tourism sector through the provision of an alternative accommodation for the tourists. However, the current Homestay programme needs further attention and development strategies due to the conflict among heritage conservation and urbanization. This is because of a lack of knowledge about cultural elements and heritage among the local communities, particularly youth in villages.

Recently, youths are influenced by the modern technology on the internet. Their leisure time is spent on the computer rather than executing the social activities. The relationship between parents, children, and neighbour have gaps because they are enjoying the modern technology. When children use computers

instead of participating in social activities, it raises concerns about the possible effects on their physical and psychological well being. In 1999, results from a national survey stated that children between ages 2 and 17 were spending approximately 1 hour 37 minutes per day using the computer and/or playing video games, about 24 minutes more than in 1998. In my point of view, the modern technologies have influenced the youth in urban and rural areas. This is because majority youth in villages are studying in urban areas. They are decreasing the culture of rural development by ignoring the uniqueness of cultural factors.

The objective in this paper is to apply the concept of homestay programme and cultural elements among youths in villages. In the last few decades, statistics on the cultural sector, have recognized that culture can be a powerful driver for development, with community wide social, economic and environmental impacts. Cultural and creative industries represent one of the most rapidly expanding sectors in the global economy with a growth rate of 17.6 % in the Middle East, 13.9 % in Africa, 11.9 % in South America, 9.7 % in Asia, 6.9 % in Oceania, and 4.3 % in North and Central America. Today, many cities use cultural heritage and cultural elements and institutions to improve their image, encourage urban development, and attract visitors as well as investments.

CONCEPT OF COMMUNITY-BASED TOURISM

The Community-based tourism (CBT) concept has been used to boost the rural development, both in developed world countries such as Ireland (Storey, 2004) and in the developing world such as Brazil.(Honey, 2008). The CBT is a type of tourism that is closely related to nature, culture and local custom. It is designed to attract the tourist market that needs authentic experiences, enhancing community development, poverty alleviation and conservation (Equation, 2008:62). The community based tourism rapidly growing in Malaysia when this programme increases the demands for access to the countryside, better private mobility, more leisure time, fresh air and active pastimes (Ibrahim,2004). Homestay Programme in Malaysia was introduced in 1988 by The Ministry of Arts, Culture, and Tourism (MOCAT). The purpose of this programme is to offer an lodging for the tourists and discover the local and cultural lifestyle.(Kayat, 2009). MOCAT established guidelines to assist planning and executing this program, particularly in the aspects of health and security. Homestay programme mostly in rural areas, where the tourist will accommodate, be entertained by the cultural performances and traditional activities and have meals with their adoptive families. (Aminudin and Jamal, 2006). The main feature of the Malaysian Homestay programme distinguishes it from Homestays in other locations:

“... is the element whereby guests live with the homestay operators who are usually considered adoptive families (or *keluarga angkat* in Malay) throughout the visit. The activities include the guests eating, cooking, and performing various other activities together with their adoptive families, allowing the tourists to discover the cultural activities and interact with the local residents. (Kayat, 2009)”.

The Homestay programme in Malaysia is not new to the tourism industry. The Homestay in Malaysia can be traced in 1970s at Kampung Cherating Lama in Pahang (Amran,1997). The programme began when a local woman called Mak Long took in long staying drifter and provided with breakfast, dinner, and accommodation within her Kampong house. At the beginning, the Homestay normally located along the beach. Desa Murni Homestay Programme was the first Homestay Programme that gets support from MOCAT in 1988 which includes five villages near Temerloh, Pahang. With this programme, the local residents worked together to participate in the Homestay programme activities and the results have had a spectacular effect on the local economy. After the success of Desa Murni Homestay Programme, the government took the first steps to inspire other communities to produce their own Homestay programme. Homestay tourism creates an opportunity for visitors to come closer to the rural world, to its culture and heritage, to the notion of the countryside, to peacefulness, and to

physical and spiritual rejuvenation as portrayed by Peterson (2004:57)

“Mealtime is an opportunity to learn more about the Malaysian culture. First, footwear is removed before stepping the veranda that leads to the host family’s front door. Guests sit cross-legs on the floor adjacent to the kitchen in a long dining hall where a tablecloth is spread the length of the room. Before and after the meal, hands are rinsed using water from a *kendi*, an ornate silver kettle with a basin to catch the water. The food is eaten without utensils using only the right hand. Lifting out the white rice takes some practice but is made all the more fun by trying out the variety of foods such as chicken curry and sambal belacan, a spicy shrimp paste. Dessert is often pineapple, papaya, *rambutan* or other fruit grown in nearby orchards. Basir explained that it is polite to offer the best morsels of food to your tablecloth neighbor.”

In this paper the argument is the homestay programme is a good effort to encourage the local community if it works. Recently, in villages local community ignore the cultural elements in their hometown because of the modern technology. The modern technology affect their daily lifestyle and limits their social activities with the communities.

CONCEPT OF CULTURAL LANDSCAPE

The cultural landscape is one of the tourism product that can be developed through the tourism sector. In this sense, cultural diversity is looked for an active tourist who are looking for new experiences. The cultural landscape had long been used in a variety of ways from different disciplines (Jones 2003). In 1920’s, an American cultural geographer, Carl O. Sauer has described the cultural landscape in his book, *The Morphology of Landscape*, Sauer (1925) stated that:

“Culture is the agent, the natural area is the medium, the cultural landscape the result”.

The main idea of his description explains that cultural landscape are changing because of the changing landscape by humans over time and the landscape activities. However, from this early development of cultural landscape ideas, only in 1992 the cultural heritage began to recognize by the world conservation bodies.(Phillips, 2003). According to *Cultural Landscape in Mongolian Tourism*, cultural geographers such as Salter (1971), Crang (1998) , and Claval (1998) refer from the idea of Vidal de la Blanche on cultural landscape noted that many cultural landscapes are already foci for tourism (2004: 24). I agree with Sauer that culture is the agent and the natural area is the medium. It is because the culture is the main product that nurture the natural environment. The community is the subject to enhance the cultural landscape in the area. If local community do not experience the cultural element in their villages, the originality if the culture will be decreased.

In the Mediterranean Basin, Naveh (1995) stressed that cultural landscapes are:

“A tangible meeting point between nature and mind”.

The central idea of his description is the notion of culture we are broadening is landscape ecology from the physical, biological, and ecological realms of natural sciences to the sociological, anthropological, psychological, philosophical and historical realms. Mechanistic conceptualization of humans as agents of negative, environmental impacts the concept of humans as thinking, (Zube, 1987) feeling and nature loving (Golley, 1990) organisms who not only perceive landscapes but also interact with them in ‘transactional processes’.

In the last few years, people have been motivated towards the sustainable development in their daily lifestyle. The cultural landscape is one of the heritage tourism that has been identified as a tourism product to be explicated in the tourism industry. The issue for the cultural landscape in the tourism industry is its sustainability and knowledge among the local communities. Nowadays the western's knowledge and cultures are dominated in several tourism areas. Moreover, after the development of tourism, the westerners are influencing the local communities with their culture and slowly the rural culture are threatened by them.

RELATIONSHIP BETWEEN CULTURAL LANDSCAPE, LOCAL COMMUNITY AND HOMESTAY PROGRAMME.

Generally, culture is found in a place and gives its own meaning. When we go to the place that has its own values, no matter how specific or detailed our descriptions of place may be, something of importance is left out, the unknown or unrecognized (Casey, 1996). A place is a reality and never change unless the changes because of urbanization and human activities disturbing the originality of the place. Time and history cannot be separated from a place, although places will be known by its most manifested aspect which is culture. I agree with Casey (1996) that places cannot be recognized and placed within our descriptions, it is more than a word and more to an image and portraiture.

Recently, the cultural landscape has been used to boost the tourism industry mostly in the developing countries, In Malaysia, the Homestay programme is a tourism product that can be maintained and conserved the cultural elements. After the development of Homestay programme, the issues that can be seen is the participating from the local communities. The local communities in villages area are lack of knowledge about the cultural elements especially youth. Nowadays, mostly youths are spending on computers at home and the modern technology may make a difference in their lives.

This programme, mostly involved the old villagers that know the history and cultural element from the pastimes. Traditional knowledge is important for the teenagers to know the history from their parents. Traditional knowledge is gained by passing the information through their parents and experience the cultural elements by yourselves. Some forms of cultural elements and history, can be expressed through rituals, stories, songs, legends, traditional performances and idioms. Smith (1999) described that people do not interested to involve in any activities because of lack of information and knowledge. Smith explained that in general, people do not know how to behave and ignore until they obtain the information about the activities.

According to previous study by Nyaupane (2006), local communities have to face limitations when the government implemented the Homestay programmes. The limitations include the lack of financial resources, infrastructure or know-how; limitations of a cultural kind and potential conflicts between the different public administrations). The main benefits of community tourism are the direct economic impact on families, socio-economic improvements, and sustainable diversification of lifestyles (Manyara and Jones, 2007; Rastegar, 2010). To ensure that community-based tourism to be successful, it is most important to explore local community attitudes toward the programme. It is useless to find out later that the locals have negative perceptions about the programme as it would be more difficult to reverse the damage (Beeton, 2006).

In recent years, the concept of public participation in the tourism development becomes an issue in developed and developing countries (Dutt, 2004). The problems include the negative view of local authority, lack of local authority experience and lack of public interest. The negative aspect of the local authority was discussed by Lowndes (2001). He found that some people have negative opinions of their local authority. Lack of experience demonstrated by the local authority was the main reason for

ineffective participation (Ascher, 1997). Botes and Rensburg (2000) stated that the public willingness to participate in any program is caused by past experiences of public participation that is not successful. Although there are numerous events to help the public participate in the tourism development, the government has to make a further research to attract the public to participate in the programme. The cultural elements in Homestay programme is the key aspect that can help the local community to learn, receive information, and practiced cultural landscape in their daily lifestyle.

CONCLUSION

The tourism industry is the booming sector in Malaysia and generally the Homestay programme is affordable for tourists to explore the local culture and local lifestyle. It is a programme that involves the local communities and the operators. The homestay programme is not only the community based tourism but a strategy to develop the rural development for the tourists. This programme exposed the uniqueness of Malay culture to the tourists. Moreover the cultural sustainability is important to create a sustainable rural development and retain the cultural values for future generations. From this programme, the local communities especially youth can discover the local culture and practices in their daily life. However, recently, majority of youth ignores the cultural values and do not involve in the Homestay programme development. A cultural landscape tourism strategies would help to ensure the sustainability of the culture in the tourism activities and the local communities can sustain their natural resources for their future economic activities.

REFERENCE

- Aminudin N and Jamal SA (2006). Homestay Selangor: Keunikan dan Pengalaman Pengusaha. Selangor: Pusat Penerbitan Univesiti (UPENA).
- Beeton, S. (2006). Community Development through Tourism. Collingwood, Landlink Press
- Claval, P. (1998). Introduction to Regional Geography. Oxford: Blackwells.
- Crang, M. (1998). Cultural Geography. London: Routledge.
- Golley, F. B. (1990). Love of the land. *Landscape Ecology* 4:81-82.
- Ibrahim Y (2004). Homestay program in Malaysia: development and prospect. *ASEAN Journal on Hospitality and Tourism* 3 (1): 65–75.
- Jones, M. (2003). The concept of cultural landscape: discourse and narratives. In H. Palang, and G. Fry (eds.). *Landscape Interfaces: Cultural Heritage in Changing Landscapes*. Kluwer: Dordrecht, pp. 20–51.
- Kayat K (2003). Exploring factors influencing individual participation in community-based tourism: the case of Kampung Relau Homestay Program, Malaysia. *Asia Pacific Journal of Tourism Research* 7(2): 19–27.
- Kayat K (2009). Community based tourism in developing countries. Paper presented at the International Seminar on Community Based Tourism, Shah Alam, Malaysia, 4–5 August.
- Lowndes, V., Stoker, G., Pratchett, L., Wilson, D., Leach, S. and Wingfield, M. (1998). *Enhancing public participation in local government*. London: Department of the Environment, Transport and the Regions.
- Ministry of Culture, Arts and Tourism. (2001). Rural Tourism Plan. Kuala Lumpur: Ministry of Culture, Arts and Tourism.
- Manyara, G. & Jones, E. (2007). Community-based tourism enterprises development in Kenya: An

- exploration of their potential as avenues of poverty reduction. *Journal of Sustainable Tourism*, Vol. 15, No.6, pp.628-644.
- Musa G, Kayat K and Thirumoorthi T (2009). The experiential aspect of rural homestay among Chinese and Malay students using diary method. *Tourism and Hospitality Research* 10: 25–41.
- Naveh, Z. (1995). Interactions of landscapes and cultures. *Landscape and Urban Planning* 32: 43–54.
- Nyaupane, G.P., Morais, D.B. & Dowler, L. (2006). The role of community involvement and number/type of visitors on tourism impacts: A controlled comparison of Annapurna, Nepal and Northwest Yunna, China. *Tourism Management*, Vol. 27, No. 6, pp.1373-1385.
- Papayannis, T. (2004). Tourism carrying capacity in areas of ecological importance. In H. Coccossis and A. Mexa (eds.) *The Challenge of Tourism Carrying Capacity Assessment*. Ashgate: Aldershot, UK, pp. 151–162.
- Peterson, B. (2004). *Cultural Intelligence: A guide to working with people from other cultures*. Boston, MA: Intercultural Press.
- Phillips, A. (2002). *Management Guidelines for IUCN Category V Protected Areas: Protected Landscapes/Seascapes*. IUCN: Gland, Switzerland and Cambridge
- Salter, C. (1971). *The Cultural Landscape*. Belmont: Duxbury.
- Sauer, Carl. O. (1925). 'The Morphology of Landscape', *University of California Publications in Geography*, vol. 2, no. 2, pp19-54, reprinted in J. Leighly, 1963 (ed) *Land and Life: A Selection from the writings of Carl Ortwin Sauer*, University of California Press, Berkeley and Los Angeles, pp 315-350.
- Zube, Ervin H., Sell, J.L & Taylor, J.G (1982), *Landscape Perception: Research, Application and Theory*, *Landscape Planning*, vol. 9, p. 1-33.

ARCHITECTURAL AND CULTURAL BACKGROUND OF THE OLD CITY OF IBB – YEMEN

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ABSTRACT

Ibb, a Yemeni city located south of Sana'a, has grown in medieval Islamic successive and characterized in the formulation of mountainous terrain to make it the most important agricultural area in Yemen. This has led to development of civilization, architecture, and building. Moreover, it derived resources of surrounding environment, It is located on a hill rocky high mountain, and owns Ibb a lot of the ingredients of civilization in both cultural and natural sides, and that helped in its composition. It is natural to crystallize the cultural heritage of the city through the environment of civilization that grow and which is divided into the cultural environment, which has changed over the centuries. The natural environment is not changed, and so develop the city according to two variables, one fixed and one variable. The research aims to study the cultural and historical constituents of the old city of Ibb, and the reflection of those ingredients on the architecture of its distinctive exterior character and vocabulary items inside, as a prelude to carry out maintenance work and be included in the World Heritage List.

Key Words: *Ibb , Yemen, cultural and historical constituents, architecture*

INTRODUCTION

Unlike other countries in the region, Yemen owns a unique heritage, replete with a lot of cultural inventory. In addition, Yemeni civilization is considered as one of the most ancient human civilizations. It was ruled in the form of states and kingdoms where several civilizations were established marking those civilizations with heritage intellectually and culturally significant. The most important factor in such civilizations was its geographical location on the trade route and the adoption of people on the activity of agriculture based on irrigation system associated with the construction of dams and barriers which reflected the prosperity of economic stability and prosperity of human life of Yemenis. Therefore it was known as "Arabia Felix", which showed the booming cities to construction and the model of Architecture and urban characteristics of voids. This is actually what shows its monuments and ancient cities and inscriptions remaining to now reflecting the serious attempts of Yemenis to always search for items and tools that help in the expression of their existence and survival through continuous development of architecture and construction.

In fact, all these characteristics have been recorded as sources of history of what civilization in Yemen has owned as affairs and prosperity of great architecture. The most important of these sources

mentioned by the Qur'an in the description of the Kingdom of Sheba, describing what it was the throne of Queen Bilqis (Sura Sheba verse 12 and Sura Enamel verse 23).

However, the traditional Yemeni architecture varied that it is not based on the Islamic way such as architecture in different Arab and Muslim cities, and therefore the traditional Architecture in Yemen remained different in character and privacy (Salam, 1995, p12-13). It was able to absorb the role under successive variables each stage, before and after Islam and to the present both integrated with the expansion of vertical and openness towards the outside while we find architecture in the Arab world with the expansion of horizontal and open inward, and the main features are clear that characterize the architecture of Yemen exposing the functional integration among the elements of the building to serve the goal of function given as home, mosque, market, etc., and due to being organic relying on materials available locally compatible with the environment and climate, and privacy to meet the social and religious needs.

The buildings with its various kinds construe an integrated entirety to serve their purposes for which they have been constructed within a general and unified frame and a key to the gradient openness towards the outside, relying and benefiting from the experiences of the past and its privacy, along with a characteristic of uniqueness in architecture. All led to the making of unique character of the Yemeni civilization, different from the global architectural styles or those in neighboring countries, or those with similar religious beliefs (Martini, 1991, p11).

TRADITIONAL YEMENI ARCHITECTURE

The land of Yemen is distributed in the form of regions as topographical variety between the coastal plains and mountainous eastern plateau and alum desert. This is actually due to the diversity of climate, geography and natural ingredients of the Yemeni environment. Furthermore, the multiplicity of sources of water and natural resources and materials available for the construction. They have contributed to create the final image of the distribution of the population and their types of living and their economic activities (Abdu, 2002, p6), distinguishing Yemen multiple regions and geographic diversity of environmental characteristics and climatic, topographic and different local building materials which have contributed to the emergence of urban building different patterns (Hanshor, 2009, p27).

Traditional building appeared for each region deriving its composition, structure and shape from the materials locally available in the surroundings like the local environment. Although the architecture of Yemen is characterized by one architectural language, the differences and diversity of climatic and geographical conditions of natural area to another affect different materials and methods of construction in the traditional architecture which create, diversity and richness in the elements and architectural character. Each city has its own character appropriate with local climate and natural conditions (Al-Kebsy, 2008, p5). It was a good example of human interaction with the environment. It also showed the perfect balance with nature as Architecture and Urbanism are two realities that reflect the life of the community over the different eras (Al-Zabadi, 2007, p89). The Yemenis used several methods in building traditional construction in line with the functional requirements and environmental determinants that belong to each region, conditions and determinants of social and cultural factors.

The surrounding environment helped in human settlements as a catalyst in the development of the perceptions of the first man to handle and use them effectively and substantially. The buildings that are found in the mountainous areas were constructed from natural materials available in the region (Hanshor, 2009, p85). The materials and traditional techniques in architecture helped Yemenis preserve the traditional architecture and achieved structural requirements and aesthetics of traditional architecture and this is what we observe in the architecture of Yemeni old cities listed in the World

Heritage List as Sana'a Old City, and the city of Shibam Hadramout, and Zabid. There is also a group of other Yemeni old cities that have not received the recognition due attention to maintaining buildings and heritage like Jebelah City and the ancient city of Ibb and many other cities that still retain the intellectual and human heritage.

THE OLD CITY OF IBB

The old City of Ibb owns a lot of the ingredients of civilization and that helped in the formation of identity and style of civilization with them. It is natural to crystallize the cultural heritage of the city through the environment of civilization that are growing and which are divided into the cultural environment, which has been changed over the centuries, and the natural environment which did not change and hardly differed, and to develop the city, there have to be two variables, one fixed and one variable (Ibrahim, 1986, p13).

1. CULTURAL INGREDIENTS OF IBB CITY

a) HISTORICAL CULTURAL BACKGROUND

Ibb city is the capital of the region in one of most fertile areas in Yemen. It is located on a hill as in Figure 1, which expanded at a later time on the road there between it and the road between Sana'a and Taiz (Varando, 2010, p231). It is also known the "Thajh City ". The historian, Ismail Akwa states "that the city of Ibb was mentioned in the news and literature only in the late fourth century AH when it was attacked by Abdullah bin Qahtan Hawaali in 380 AH, and was before that just a village having only its mosque and wall" as in Figure 1 (National Information Center Yemen, Government of Ibb, 2013). In fact, the city represented the cultural center based on a group of buildings and important projects, which provide a stable and civilized life. The city possesses elements of civilized life, which competed the most known cities at that period.

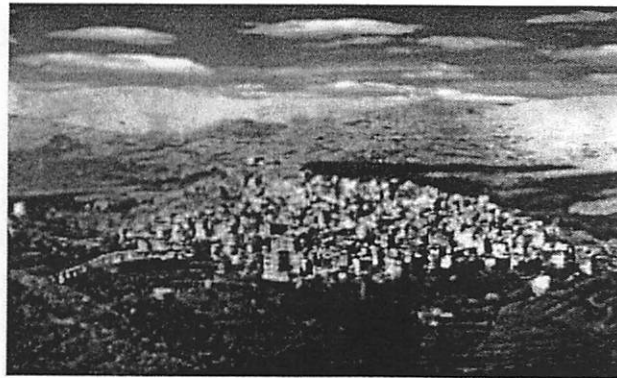


Figure 1

The Old City of Ibb in 1963

Source: National Information Center - Ibb

In fact, the city was not quite large having high rise houses similar to those in neighboring cities like "The city of Jableh". The builders and craftsmen were supposed move between the two cities. The architectural model and the overall shape in the two cities were very similar because of the distance between them was so short in addition to the fact that the city of Ibb in prior periods was ruled by the rulers of Jableh. This resulted in transmission of skills and expertise between both cities. It is very likely that the city of Ibb was influenced by the city of Jableh in the beginning (Swanson, 1997, p93). It was known as one of the villages of Jableh in the era of Sulayhid State (Al-Afif Cultural Foundation, 2002, p82). The architecture of Ibb flourished in Al Rasoliah State. Mosques and schools were built and

confined inside the city wall of stone until the second decade of the twentieth century and specifically after the revolution of September 26, 1962, when people began to build their homes outside the city walls (Al-Kadri, 2010, p395).

b) CUSTOMS AND TRADITIONS

The Yemeni society is considered one of the traditional societies before the revolution of 1962, primarily as a farming community (Al-Hadari, 2000, p60). The Ibb community is considered agricultural society where the customs and influential traditions represent the effective factor in determining its identity. Therefore, the city was governed by a group of customs and habits which run the human life, past and worked as a group of customary laws that added some kind of uniqueness, and worked as a regulator of human relationships which regulated its daily life and was reflected on the city as a result of controlling its determinants.

c) THE SCIENTIFIC DEVELOPMENT

The old city of Ibb was an important scientific center where scientists and scholars who have studied in its schools graduated (Al-Afif Cultural Foundation, 2002, p84-86). Some of these educational buildings still exist until the present day. The center is still continuing to teach science students and memorization of the Koran and study sciences of law. There are also many schools of education still in the old city of Ibb such Al Gamaa Alkaber School, Al Mashanah School, Al Galaliah School, and Asadiaa School. Asadiaa School is the smallest and its construction dates back to the era of the Al Rasoliah State Church. The school building, i.e. its architectural construction has attracted the interests of many with its traditional originality without renewal or addition as shown in Figure 2 and Figure 3 (Swanson, 1997, p98).

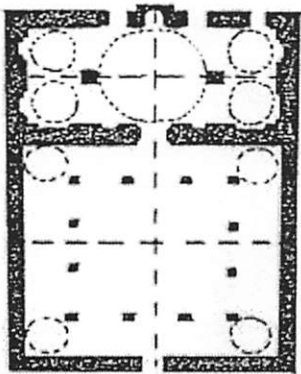


Figure 2

Plan Asadiah School

Source: Swanson, 1997, p98.

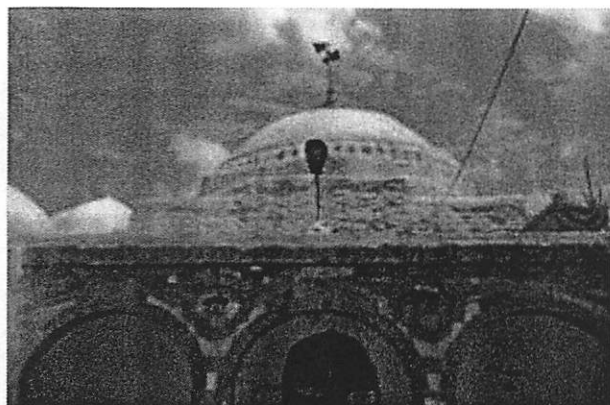


Figure 3

Asadiah School

d) RELIGION

Religion is a source of spiritual and moral needs to Man, it thus represents the weight of the balance between these needs and the physical needs (Ibrahim, 1986, p25). There was a significant effect of religion in the traditional way of life due to its strong impact in the life of society, and this helped to influence the stability and continuity of the cultural of social aspects despite the political changes ongoing and the external concomitant influences (Al-Hadari, 2000, p63). The religious architecture represents one of the symbols of the effect of the presence of religion in the life of the community represented by the mosque and its presence in the city as a symbol of the presence of the

religious community and the city. This leads to containing the old city of Ibb many mosques. One of these old mosques is the Great Mosque, which is the first mosque built in the city by the order of the Caliph Omar ibn Al-Khattab (Swanson, 1997, p98). The city contains fifteen mosques which have been classified into two categories: the first category is called the gathering mosques for all people such as the Great Mosque while the second class contains small mosques serving small zones decorated with domes including the Shemaysi mosque and Kazhemi Mosque.

2. NATURAL INGREDIENTS OF THE CITY

a) NATURE OF THE LAND

The old city of Ibb was built on a high hill in the western slope of Riemann Mount of Badan in the territory of the highlands and which is characterized as a topographical mountain which consists of a series of mountainous North-South (Drmosh, 2010, p49), and the city is about 2000m above sea level (Messick, 1993, p11).

b) ENVIRONMENT AND CLIMATE

The environment and climate represent the most important factor of civilization that the city of Ibb was based upon, and its position and geographical nature have earned it an unparalleled atmosphere. Ibb atmosphere is mild throughout the year with the cold snap mild in winter and monsoon rains throughout the summer.

TRADITIONAL ARCHITECTURE IN IBB

"Traditional architecture" means those architectures associated with the conditions of its inception of a particular geographical area. It has gained oriented development character and dynamic characteristic through the use of local materials and methods, the uniqueness applied to environmental problems in their societies. The traditional architecture in Ibb falls under this framework of definition having evolved through the interaction of intellectual between man and his urban environment. It manages to adopt the emptiness around him in the city of Ibb according to the fundamentals of urban systems, environmental, Islamic and the natural factors (Al-Hada, 2008, p291).

And it was adopted in the construction and the use of local materials and the way that does not necessarily depend on using manufacturing material and modern techniques. Hand tools and simple traditional ways were used. It was dependent on human normal skills, before the machine was used in the building. So, the architecture in the city of Ibb is "traditional" as architecture, which was built in the period before the revolution of September 26, 1962 AD. In fact, traditional architecture in Ibb has characterized by being a towering architecture of stone. The building in city rises up (five to six floors) as shown in Figure 4 (Al-Hada, 2008, p295). It was reflected on all social and economic aspects, dealings with the facts of the possibility of dealing in these data and taking in all its aspects to access architecture revision on these aspects and reflected on a unified character (Drmosh, 2010, p49).

All the unique buildings were documented in descriptive historical writings by travelers in the description of architecture of the city and its buildings and paved roads. This uniqueness came in the form of structural style and physical characteristic stemming from the material and technical construction used, and literal treated with the possibilities that are available in the frame around. It was created at the creativity as architecture stands majestically for hundreds of years. This was reflected on the technical skill and professional constructions and the optimal utilization of the properties and characteristics of building materials and method of construction followed stemming from the thought of

the basis of the composition of the substance (Drmosh, 2010, p49).

The city's location in the territory of the highlands gives it an important role in building and stone as the basic material in construction which has been used in the construction of almost all elements in architecture as shown in Figure 4. Its characteristics and attributes of construction helped in its strength, durability, resistance to environmental factors, the aesthetic shape and beautiful colors, and other materials were used in forming the type and character of traditional architecture in Ibb.

The study of the facade elements of architectural buildings of the city of Ibb shows the extent enjoyed by models of construction and configuration of the interface to material by a unique traditional style. We can make sure of this by noticing the analysis of this style over the literal descriptive material in the construction and create a spirit of forming them, to look expressive about their important careers in the construction and significance. Its fine integration is between construction stemming from the properties of matter and form traditional architecture (Drmosh, 2010, p122).

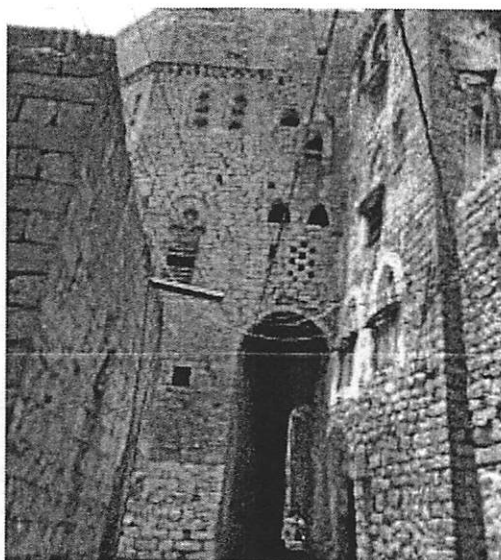


Figure 4

Traditional Stone Architecture in Ibb

1) TRADITIONAL ARCHITECTURAL STYLE

The traditional architecture in Ibb is characterized generally by style and architectural stone. It was the style and method of construction in which the stone is an important factor in the formation of these architectural styles, in addition to a range of other factors that have assisted in the formation of this trend.

The architectural interface of the traditional buildings in Ibb is characterized being extended to head up more than five floors. It is characterized by its richness and diversity of its various components and diverse decoration. The opening is varied and changing spaces across floors, and the eaves and contracts interlaced with elongation anchored as well as aesthetic formations that is circulated on the interface of architecture. The following are some elements of the traditional architectural facade in the old city of Ibb:

a) OPENINGS

The openings show harmonious traditional interface which gave it a dynamic character, where shapes and areas are changed. When the construction moves to the top, the area of openings increases. Some people ascribed that to the function performed by the architectural vacuums, others say that they are related to social aspects which give it specific spaces basements, and some are due to the system bearing walls on the premises of the old city. The ground floor is free from the windows with increased thickness of the walls sometimes showing only small rectangular opening (Al-Hada, 2008, p296).

Also space and number of openings increase in the upper floors of buildings, which is usually a form of header elongation as shown in Figure 5. On the front appear other types of openings to ensure proper ventilation of the spaces that need constant motion of air. It appears to be used mostly for spacious kitchens, stairs. It is a small rectangular harmonious opening, convergent and sequential building blocks a width not exceeding about 10 cm and a height not more than 25 cm as shown in Figure 6. There is another type of openings on a semi-circular arch called "Alshakos" a longitudinal slot at the top of the room, the dimensions of 30 x 50 cm approx. It has been used to renovate airy rooms and the insertion of moonlight into the room at night, and locally called "Al Qamariaa" as shown in Figure 7.



Figure 5

The Form of the Opening and Insert Area

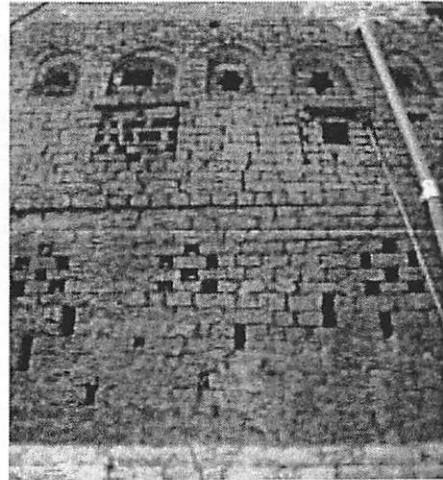


Figure 6

Opening in Kitchens, Stairs

b) ARCH

The arch of traditional architecture in lbb formed aesthetic property in the formation of the features of the model and the nature of the architecture interface of the buildings as shown in Figure 8. It is characterized in the levels of consecutive nested within the thickness of the wall. Some sort of rhythm was set in the facades of buildings. All arches came in the form of a semi-circular except for a few Gothic arch (Al-Habashi, Drmsh, 2009, p793).

All half circular Arches are based on the slot with a header elongation as shown in Figure 7. It is usually within the thickness of the wall and stands out from external edged arch. It is also usually central arch which imposes bilateral or Triple circuit as shown in Figure 7.

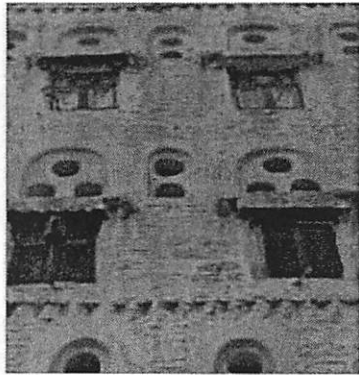


Figure 7

Opening and "Al Shakos"

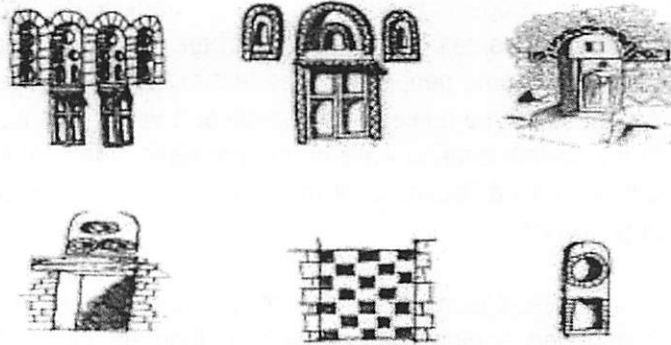


Figure 8

Openings and Arches for Building in Ibb
Source: Mohammed Al-Hada, 2008, p305.

c) COMICES (BELTS)

Cornices represent an architecturally important role in the architecture interface for building in the old city of Ibb using the optimal separating formality of floors. It improves the aesthetics of the building through juts phenomenon on the front and the reflection of light and shadow on the interface.

It is also different from the rest of the wall constructive way. It can be distinguish it in three-dimensional forms in that some are in the form of stalactites unilateral or bilateral or trilateral grade and fluttering from the top stone slabs, it used fulcrum, and new to continue building the wall and increase the interconnected as in Figure 9. Some operate in the cornices as the structural cantilever function which increases the space of the room on the upper floors as shown in Figure 10.

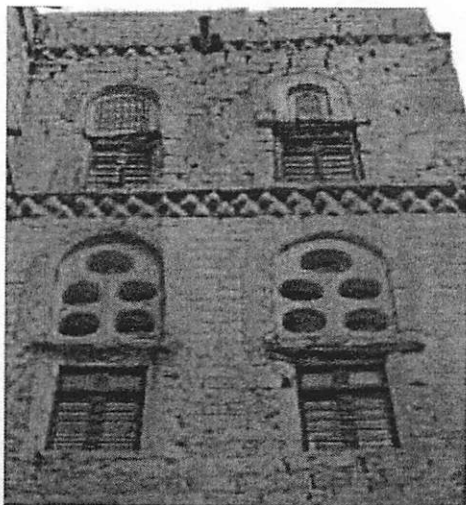


Figure 9

Cornice Stone Three-dimensional

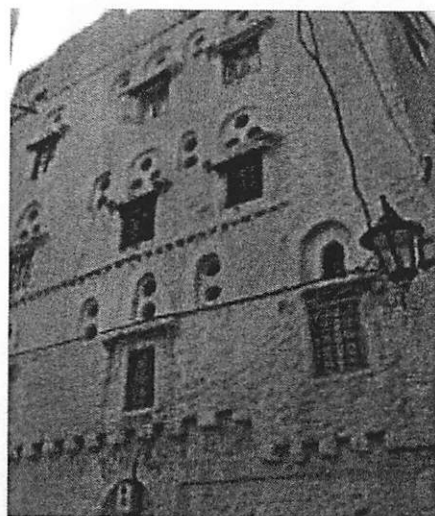


Figure 10

Cantilever Cornice Stone

d) STONE STALACTITES AND JUTS

Stone Stalactites are important elements of architecture and decorative building. It consists of gathering elements in the form of levels of bending. The importance of aesthetic comes from special geometries and spatial configurations of three-dimensional; also structurally it played in the transition and transformation of a geometric shape to another. Stalactites are used in turning the circular corner of

the square corner in the upper floors as in Figure 11. In the ground floor of the outer corner of the building's circular to facilitate movement in the corridors of outside lanes and especially the narrow ones.

Juts are shown as the emergence of the construction unit for other spaces, but not more than one-third of the length of the construction unit as shown in Figure 12. Juts are not shown significantly because of the possibilities of stalactites provided by traditional material. In the traditional architecture, exploitation appeared limited because the properties of stone tightening are allowed to be exploited only in specific places (Drmosh, 2010, p43).

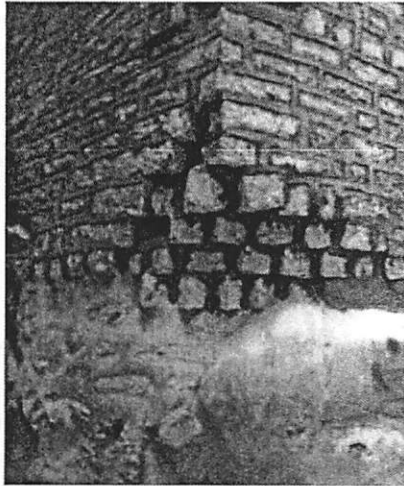


Figure 11

Stalactites Stone in the Exterior Corridors

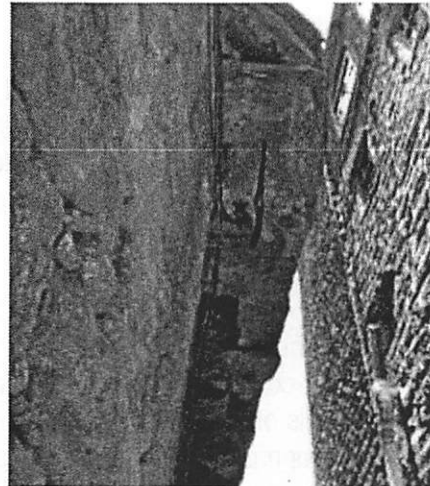


Figure 12

Juts Stone and Cantilever

e) WOOD AND STONE "MASHRABYAS"

"Mashrabeyas" represent the decorative element of architectural style on the facades of traditional architecture in Ibb as in Figure 13. It is used in an important building of the palace, housing referees and judges, but did not show widely in public homes.

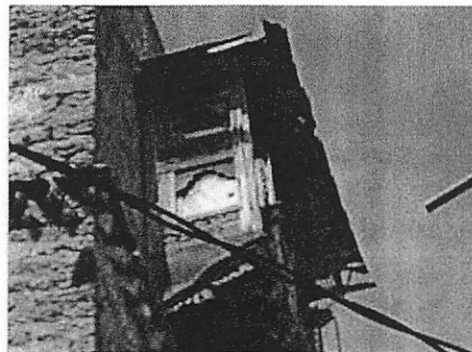


Figure (13)

Wooden Mashrabeya in Traditional Architecture

It works to provide privacy in addition to their decorative role. It is used to cover the voids in the outer windows of buildings. Also, it is used for decoration and cooling water, as well as it allows seeing through without exposing women to the eyes of strangers (Al-Hada, 2008, p298).

2) INTERIOR ARCHITECTURE

The traditional architecture voids of the architecture in Ibb came to meet the growing needs. The building turns vertically to meet those needs because of the decline of the horizontal expansion of the city, so that it can expand the construction-style independent of procedure for family members, without incurring any change in the other elements of the building.

It has been made of the principle of organic growth of building depending on the grounds of the need to add into space size by the construction extending without losing its formative style (Salam, 1995, p206). Interior events appear as a result of a series of successive expansions resulting from the needs and different requirements.

In fact, interior Architecture determined group of elements such as walls, floors, and stairs, and what these elements bear of the elements of training space and interior architecture. And despite the simplicity of inner voids and limitations due to the possibilities offered by materials and traditional techniques, but it has a lot of elements which will be discussed in the following:

a) INTERIOR DECORATION

Formations and decoration are shown in an organic form without exaggeration influenced by the local environment confirming its existence in certain features in this society. It has the variations in the architectural details of traditional housing changing the murals for each model in terms of the shape of the parietal appropriate design, as well as raw materials used that are compatible with the surrounding environment in all its details (Nafie, 2008, p1). The decorations and inscriptions of the inner vacuum appear in two types:

The first included murals and wood-beamed ceilings, which can distinguish them through inscriptions and decoration showing their doors reservoirs frescoes, decorations carved wooden doors of the vacuum procedure and decorative formations that appear in the wooden ceilings. It is a character of religious buildings like "mosques and schools" such as decorations and wooden ceiling of the Great Mosque in the old city of Ibb as shown in Figure 14.

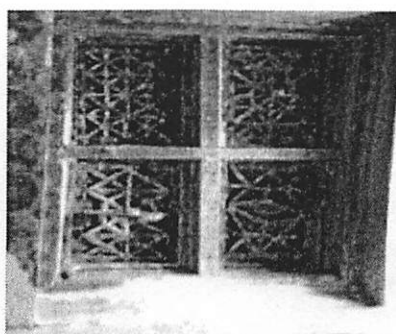


Figure 14

Decorations and Wooden Ceiling of the Great Mosque

While the other type of decoration includes decorations and inscriptions, gypsum wall and ceiling as shown in Figure 15. It is shows such decoration in guest spaces at homes, in the palace of arbiter and mosques. Inscriptions and decorations appear more in the gypsum wall surfaces which increase the proportion of the solid to the open as shown in Figure 16.

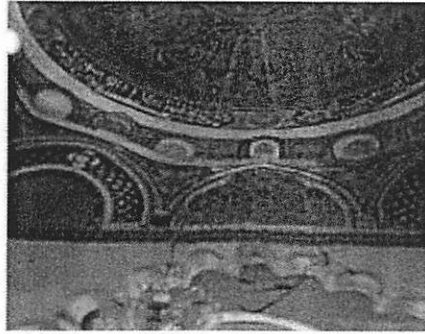


Figure 15

Gypsum Decorations in Religious Spaces

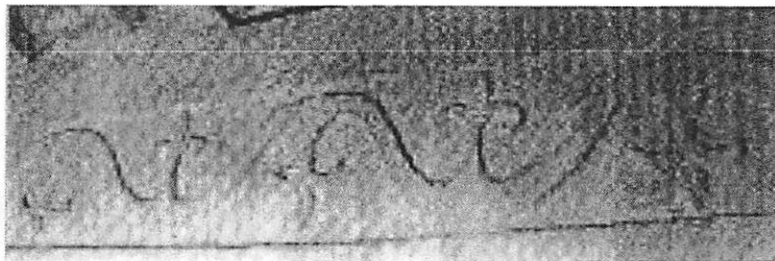


Figure 16

Gypsum Decorations in the Traditional Inner Emptiness Residential

Source: Varando, 2010, p233.

b) INTERIOR LIGHTING

Openings increase as construction goes up to the upper floors, it is reflected in the amount of interior lighting in the basements, it is almost non-existent in the basement. Traditional architecture in old city of Ibb adopted in the internal lit on the composition and openness to the outside as shown in Figure 19.

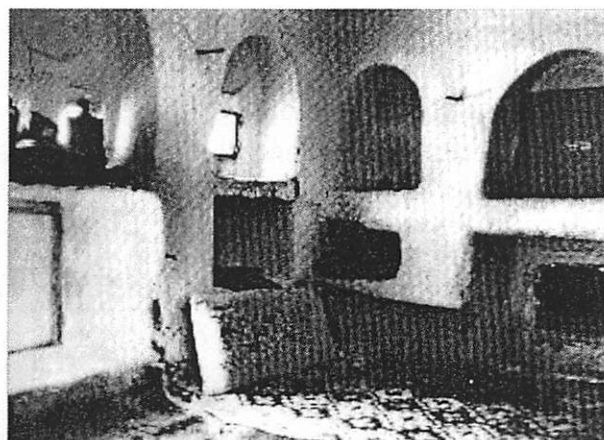


Figure 16

Interior Lighting on Spaces Traditional

Source: Varando, 2010, p233.

c) THE FORMS OF VACUUM

The forms of interior architectural vacuum are different according to the type of function performed by the building. In schools and mosques, they appeared as large areas of the square vacuum form or rectangle, because the system of structure was adopted, and it helps in the provision of larger areas.

While in residential buildings, spaces with elongation have emerged in one direction as shown in Figure 17, because the wood is short in its entirety at the coverage of the place and the entry on both sides in the presentation of the wall, causing reducing the width of the vacuum and replaced by the expansion of longitudinal space vacuum (Al-Habashi, Drmosh, 2009, p793).

The wood used in roofing is one of the trees planted in the local environment, which is used in its natural form. It had a specific effect of being controlled in the interior spaces of buildings as shown in Figure 18 (Drmosh, 2010, p50).



Figure (16)

Form of Inner Emptiness

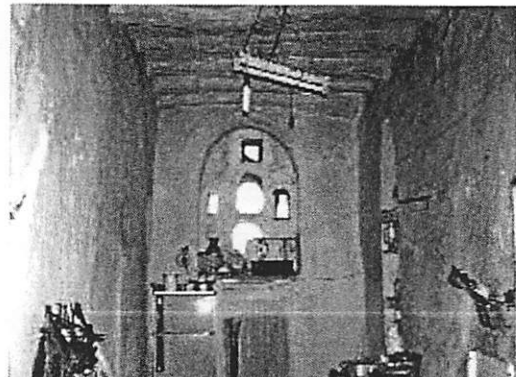


Figure (16)

Vacuum Longitudinal Because of the Wood Short

Source: Varando, 2010, p232.

RESULTS

The research study deals with knowing and evaluating the civil and historical role played by the old city of Ibb, and the reflection of those components on the style and architectural character of external and internal elements and items. During the period that preceded the revolution of September 26, 1962 AD and across time periods that accompanied the emergence of some states and kingdoms of the ancient Yemen. The study concluded with some results that can be described as follows:

1. The city of Ibb represents the ancient cultural and commercial hub and agriculturally important role. This role is the city's cultural aspect crystallized through the environment of civilization that emerged and grew through a combination of ingredients that can be divided into cultural factors and natural ones.
2. The old city of Ibb owns a group of cultural ingredient representing historical background and the role of customs, traditions and religion in the formation of the cultural environment of the city in addition to the scientific aspect.
3. The city has also a range of natural ingredients that have characterized the city such as its

moderate climate throughout the year and rain, as well as the natural environment that naturally gained it unmatched unique.

4. The traditional architecture in Ibb characterized by its architectural stone style had distinguished it from other cities in Yemen in that period, the uniqueness of items and architectural elements that are found in (openings, arches, belts, cornices, "Mashrabiyas" wood and stone). This style based on the optimal utilization of the characteristics of materials of local building communities.

5. The internal vacuums of the traditional architecture in Ibb characterized as being limited came because of the short dimensions of wood used in the roofing process and a group of processors used to increase the dimensions of the vacuum. In these roofs appear a group of motifs and patterns which vary according to the quality of the space and its users.

6. In the internal vacuums appeared simple in their entirety and especial spaces of residential buildings. Lighting representing one of the problems of those spaces, especially the basement spaces as a result of the lack of openings, but in general and in spite of their simplicity, they add a sense of the humanity to such vacuums.

CONCLUSION

From what has been stated so far, it is clear that there is a cultural and historical role the old city of Ibb manifested and highlighted through the legacy and the architecture of traditional content of civilization both its cultural and natural heritage. In addition to what is reflected in the unique and distinct character as well as their interaction with the local environment. The introduction of all the given accesses to the building stood majestically for hundreds of years, and reflected the optimal exploitation of the local and traditional materials and their role in the formation of its architectural identity and preservation.

REFERENCES

- Abdo, Moeen. (2002). Tower style assets in traditional Yemeni architecture. Master Thesis, Cairo University, Egypt.
- Al-Afif Cultural Foundation. (2002). Yemeni Encyclopedia [2nd ed.]. Sana'a, Yemen.
- Al-Hada, Muhammad. (2008). Traditional architecture in the old city of Ibb and with the surrounding environment. The Journal of university researcher, Ibb University, No. 19, Yemen. pp 291-307.
- Al-Habashi, A. and Drmosh, A. (2009, December 16-17). Materials and traditional construction techniques in the Yemeni city of Ibb: methodology for rooting local contemporary architecture. Fifth International Conference, Cairo University, Egypt. pp 791-801.
- Al-Hadri, Khaled. (2000). Urban and architectural styles Yemen contemporary public buildings. Master Thesis, Cairo University, Egypt.
- Al-Kabsy, Ashraf. (2008). Early application of the concepts of sustainability in the architectural heritage of Yemen. the Third International Conference of Building and Sustainability, University of Mohamed Khider, Sokaraa, Algeria.
- Al-Kadri, AbdulNasser. (2010). Development of residential buildings in Ibb (entrance to upgrade the urban environment). the Journal of university researcher, Ibb University, No. 25, Yemen. pp 386- 408.
- Al-Zabadi, Mansour. (2007). Global architectural trends and their impact on contemporary architecture

- in Yemen. Ph.D. thesis, Cairo University, Egypt.
- Drmosh, Ali. (2010). Contemporary Architecture in Yemen between construction systems and the traditional form: a study on the city of Ibb. Master Thesis, Monoufia University, Egypt.
- Hanshor, Ahmed. (2009), Architecture Traditional in Yafea. the second Engineering Conference, Faculty of Engineering, University of Aden, Yemen.
- Hanshor, Ahmed. (2009). Natural building materials and their impact on the multiplicity of architectural styles in Yemen. the Journal of Building Technology. XIX. Ministry of Municipal and Rural Affairs, Kingdom of Saudi Arabia. pp 84-93
- Ibrahim, Abdulhalim. (1986). Cultural heritage in contemporary Arab city. Center for Planning and Architectural Studies, Cairo, Egypt.
- Martini, Amr. (1991, January 8-9). Yemeni architecture and development prospects. World Conference Seminar on Yemeni architecture development and hobos, Aden University, Yemen.
- Messick, B. (1993). The Calligraphic State Textual Domination and History in a Muslim Society. Ph.D. thesis, University of California, U.S.A.
- Nafie, Aida. (2008, October 19 - 22). Parietal design philosophy in the method of distribution of the elements of the automatic Arab housing. International Scientific Conference - Fine Arts in Egypt 100 years of creativity, Faculty of Fine Arts, Helwan University, Egypt. pp 1-14.
- National Information Center Yemen. Government of Ibb [Online]. Retrieved January 24, 2013, from <http://www.yemen-nic.info/contents/Brief/images/ibb.pdf>
- Salam, Sultan. (1995). The impact of modern construction technology in the style of traditional Yemeni architecture. Ph.D. thesis, Helwan University, Egypt.
- Swanson, L. A. N. (1997). Historical considerations in Yemeni vernacular architecture: Houses from the Sulayhid dynasty (439/1047) to the modern period. Ph.D. Thesis, The Ohio state university, U.S.A.
- Varando, Fernando. (2010). Art of Building in Yemen [2nd ed.]. Portugal, Front Publications.

TOWARDS SUSTAINABILITY IN THE INTELLIGENT DESERT CITY

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ABSTRACT

The new or knowledge economy is redefining the city for the 21st century. This has significant implications for the way we live, work and move around our cities. In the pursuit of sustainable urban form, the notion of "the intelligent city" is invaluable, because it shares the theoretical foundations of sustainability. This paper discusses the effect of the definition of intelligent city and its principles on the components and types of life of the city in relation to sustainability and specifically for desert cities. In addition, it explores two types of future sustainable intelligent desert cities around the world, explaining their intelligent urban sustainability and the new approaches and solutions they used. Hence, the aim of this paper is to acknowledge the future of urban sustainability in desert intelligent communities.

Key Words: *Intelligent city, urban sustainability, desert communities, 21st economy, case studies.*

INTRODUCTION

Nowadays, it is widely acknowledged that the impact of urbanisation will continue to bring about major global and local changes well into the current century, as many countries in the developing world are presently in, or about to enter, the high-growth and rapid-transition phase of the urbanisation process. The problem is that the limits imposed by the expansion of the urban ecological footprint do not become evident until they are translated into local impacts, such as higher food or energy prices, frequent floods or the increment of environment-related diseases such as skin cancer. Thus, many countries are trying to go with the notion of developing sustainable cities, which enforces additional parameters in the formation of the city. In addition, more countries are trying to go with the rapid rate of technological innovations, which in urbanization was translated to the developing of intelligent cities. However today, intelligence is greatly linked with sustainability, in the form of developing new intelligent sustainable solution for the city urbanization. Thus, the research will start by explaining the driving forces in creating a city and how it can be affected by those two factors, while focusing only on desert cities.

CITY DRIVING FORCES AND FABRIC

Cities exist mainly to enable freedom and facilitate transaction. It should offer its citizens the freedom of association and expression. For example, it should allow them to associate with whomever they want, congregating in large numbers, expressing political ideas and affiliations, and to express ideas that may not be common to the majority. As for the transaction, it should facilitate both economic and social interchange, since an exchange of the ideas and goods are one of the fundamental driving forces behind a city. In addition, a city should not be static, allowing continuous growing. This paper is discussing three different factors affecting the formation of a city. The first factor is being in a desert, while the second is being sustainable, and finally the third is being intelligent. Every factor enforces additional and different determinants to the city formation. Thus, an understanding to each of them and its effect on developing a city is crucial.

MEANING AND PRINCIPLES OF A SUSTAINABLE INTELLIGENT DESERT CITY

Starting with the third factor, although it might seem a new concept, however; the intelligent city in its broadest sense is not. It is derived from the traditional city's physical context, culture and habits of its citizens, and available technology. In addition, the intelligence, here, is not, nor should it be, simply a measure of the effectiveness of a communication network. Although its first applications in the 1980s were extremely techno-centric; however, towards the end of this decade the concept began to expand beyond the limited technological terminology. Moreover, the building technologies should serve the needs of the users rather than controlling or limiting them. Thus, the intelligent city, as the intelligent building, does not have to involve high levels of technology; it could be related to other issues. In spite of having various scales where intelligence operates, starting from a single building to a multiple city region, they can function in the same way, with similar requirements. Thus, the city intelligence will be a measure of how well a city can facilitate transaction and enable freedom, taking it beyond the concept of wired or wireless networked spaces. The city's physical fabric should include its transport infrastructure, its utilities, and its building stock, in addition to its digital infrastructure, whereas, the city intelligence is the capability of the city fabric, networks and systems to function effectively and successfully over a period of time.

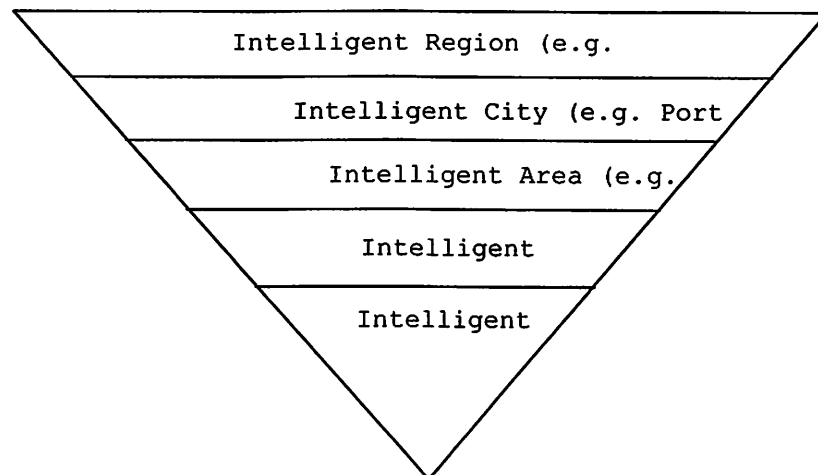


Figure 1: Scales of intelligent Source: (Jenks, M. & Dimbsey, N., 2005)

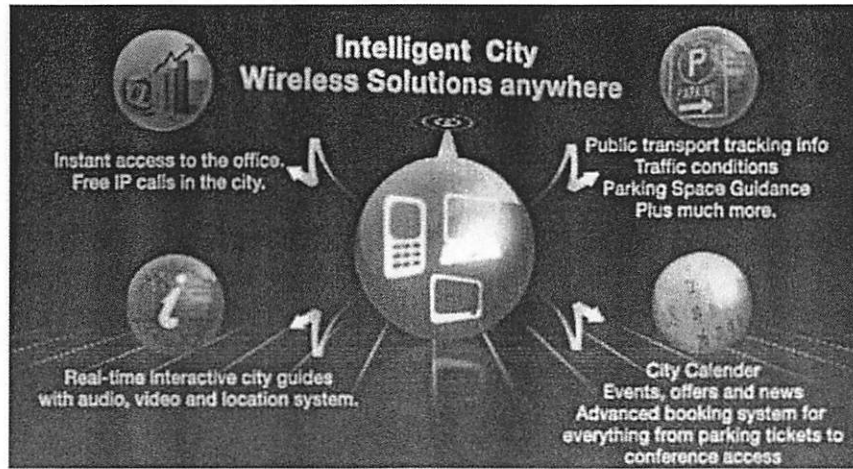


Figure 2: Intelligent city

Source: <http://www.urenio.org/2010/01/28/intelligent-city-informed-personal-travel/>

As for a sustainable city or eco-city, there are five dimensions of urban sustainability; economic, social, ecological, built environment and finally political sustainability, where it should maintain itself for many centuries. However, it is considered simply to be a city designed with consideration of environmental impact, inhabited by people dedicated to minimization of required inputs of energy, water and food, and waste output of heat, air pollution - CO₂, methane, and water pollution. If sustainability and intelligence principles in a city could be globalized, desert city principles might differ depending on where the city is. Thus the principles of a traditional Arabic city will be the one to discuss in this research. Traditional Arabic Desert City is designed to have narrow streets, natural shading, high density /low rise living, public spaces, mixed use, and to be walkable.

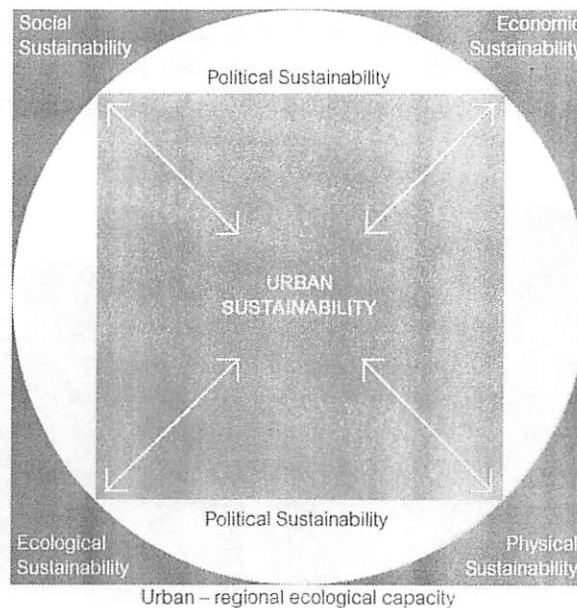


Figure 3: The Five Dimensions of Urban Sustainability Source: (Allen A., 2009)

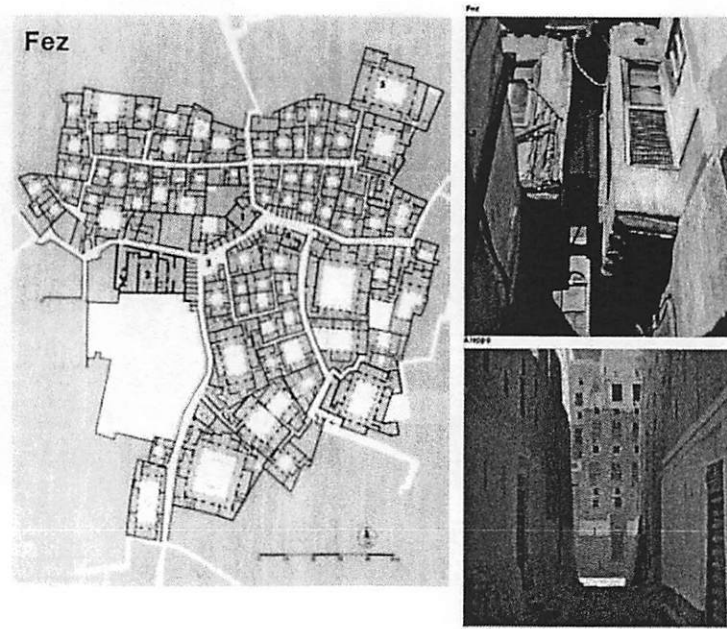


Figure 4: The urban of a desert city

Source: http://www.rpd-mohesr.com/uploads/custompages/15_MASDARCITY.pdf

EXAMPLE TO THE FUTURE SUSTAINABLE INTELLIGENT DESERT CITIES

While designing such cities for the future, the goal is no longer in only creating adaptable, intelligent and sustainable desert cities, it goes further in trying to heal what mankind, in pursue for his welfare, harmed in his natural environment. Moreover, it goes from the traditional urbanism of a city, to a new concept, where a simple building or in this case a single skyscraper can act as a whole city. An example to this is the inverted skyscraper, while it is a completely self-sufficient underground city capable of producing its own food and energy and creating a climate-controlled environment in the middle of the desert, it also heals the holes in the ground resulted from open-pit mining.

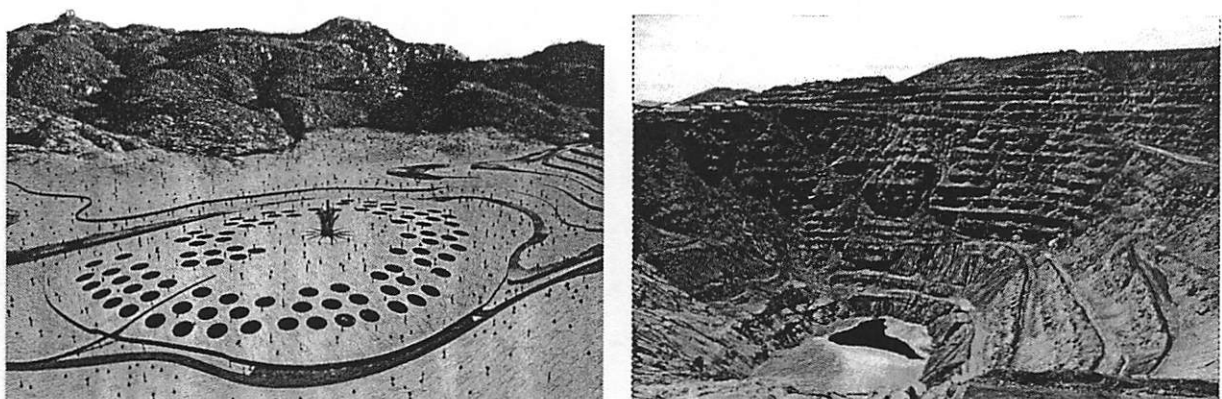


Figure 5: Over time, the dome covering the hole in the ground will blend in with the surrounding environment.

Source: <http://inhabitat.com/underground-skyscraper-that-heals-the-scars-of-open-pit-mining/>

Matthew Fromboluti of Washington University in St. Louis has a plan aims at healing the holes in the ground with an underground skyscraper that fills the hole and creates a self-sustaining community in its place. His proposal is designed to infill the 900-foot deep and nearly 300-acre wide

crater left by the former Lavender Pit Mine outside of Bisbee, Arizona. Below ground; the designed skyscraper contains areas for living, working, farming, and even recreation. In addition, a light rail system connects the self-sufficient community to the nearby town of Bisbee, while solar and wind energy will be generated. Daylighting will stream in through the skylights to light up the lower parts of the tower, and the entire structure acts as a solar chimney that ushers hot air out through the top of the dome. As the entire complex is located underground, it will not be subjected to the intense heat that above-grade buildings face in the desert. Growing terraces near the top soak up the light from the skylights to grow produce for the entire complex.

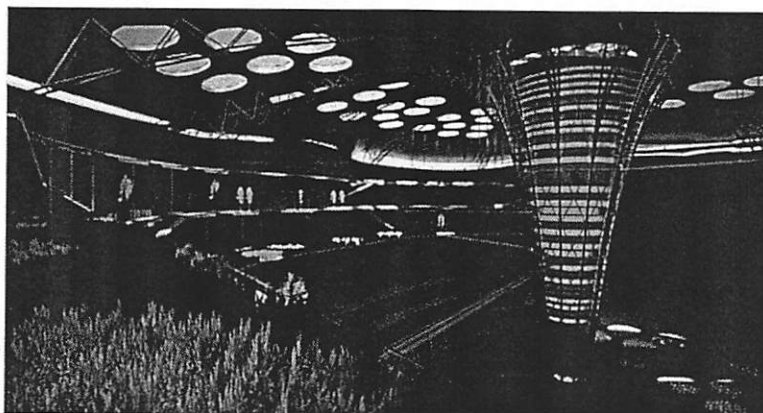


Figure 6: Developing a city in a single skyscraper

Source: Source: <http://www.evolo.us/architecture/skyscraper-or-sustainable-underground-society/>

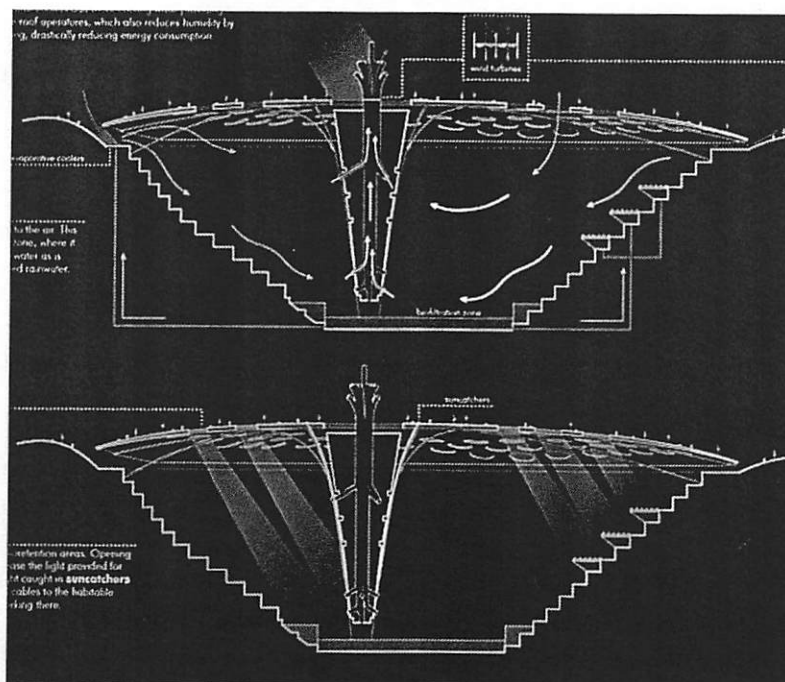


Figure 7: The lighting and ventilation solutions

Source: Source: <http://www.evolo.us/architecture/skyscraper-or-sustainable-underground-society/>

Another great example to Sustainable intelligent desert city, in the Arab region, is masdar city. The city is the eco urban project currently taking place in Abu Dhabi, UAE and is considered to be a unique city. The City will be powered with Renewable energy, and the building's design will ensure the

latest use of energy efficient technologies and smart design. In addition, the city will contain pioneering public transportation systems, while it will strive towards a zero waste objective, and water use reduction. The planned investment for the city is \$28 Billion, and expected to be constructed in 7 years. It aims at full development, since it consists of residential, commercial, institutions, and full services area. The city targeted population is 50,000 residents and 40,000 commuters.



Figure 8: An overall view for Masdar City Source: (Thorpe, J., 2009)

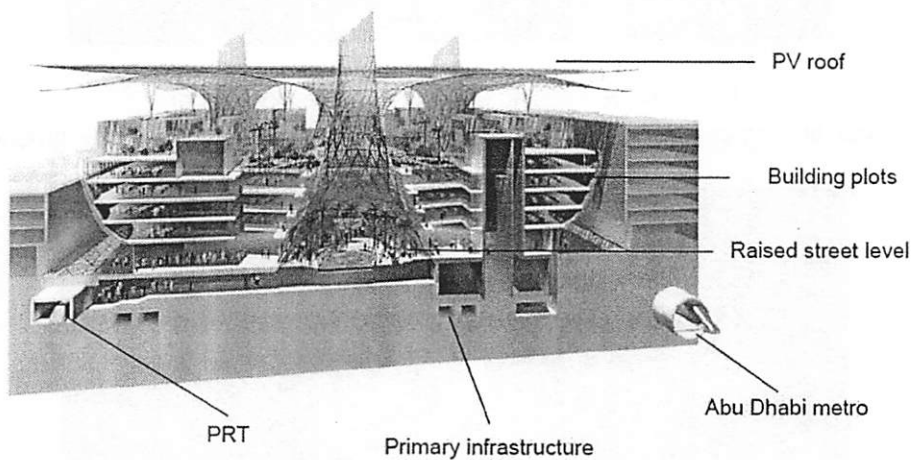


Figure 9: Masdar City sustainable solutions Source: (Thorpe, J., 2009)

It is well known, that the economy of the United Arab Emirates is very oil dependent with a very high rates of fossil fuel consumption, well above the world average; based on oil, natural gas and coal utilization. Such an important consumption of energies is represented for example in the massive utilization of air conditioning, and in the car friendly urban planning, not making possible to utilize other transportation than the car. Big amount of energy is also employed to make possible projects as acclimatized beaches, ski slope in Dubai, Ice Park in the desert and several others, demanding important amount of energies considering the desert climate conditions. In addition to this, the current green energy global movement has motivated the Abu Dhabi government to think about an economic diversification in the energy field, planning an eco-city completely based on new energies research and testing in the eco-city.

CONCLUSION

It was obvious, that in pursue of a sustainable intelligent city principles and main goals, it is not right to establish some fixed or rigid principles that may limit its development, especially, since the requirements of the intelligent city are changing. In addition, every evolution or study aimed at establishing the concept of an intelligent city has its pros and cons. Thus, a sustainable intelligent city should incorporate, in general, an understanding of the management of overlapping functions, and the potential for intensification of space and time. It should also allow local actions that are integrated into the city both regional and global visions. The city adaptability to meet changing needs over time is perceived as one of the fundamentals of an intelligent city. In addition, its main attributes are related to the primary goals of living, moving and working. As for the desert factor, although the climate parameters are constant, however the cultural ones differ according to the region. Thus, not all the desert cities have the same principles in developing them.

In relation to economy, these three factors led to an obvious increase in the economy of developing a sustainable intelligent desert city. Although it should not, however, Intelligent meant in most times the use of high level of technology, which simultaneously means an increase in budget to achieve it. Sustainability also turned into using environmental solution that depends on high level or new technologies that again led to an increase in the city formation costs. As for the last factor being a desert city, it did not make it any easier to the city's economy as well, with the high level of energy consumption needed to overcome the desert climatic demands. Thus, with the world's current challenges, especially economically, the question became, cannot planners develop a future sustainable intelligent desert city with lower rates in using technology, and simultaneously lower economical burdens, while still maintaining the city's sustainable goals and intelligence?

REFERENCES

- Allen, A., (2009). Sustainable cities or sustainable urbanisation?. UK: Published in the summer 2009 edition of 'palette', By UCL's journal of sustainable cities (online). Retrieved February 20, 2013, from <http://www.ucl.ac.uk/sustainable-cities/results/gcsc-reports/allen.pdf>
- Buletti, N., (2011). An analysis of Masdar City's communication strategy - Using speech act theory to go beyond the corporate façade. Lausanne, Switzerland: Published by University of Friburg, Faculty of Science, Geosciences Department, Geography Unit (online). Retrieved January 25, 2013, from https://docs.google.com/viewer?a=v&q=cache:pt0yJzi3AkUJ:www.unifr.ch/geoscience/geographie/pub/lib/exe/fetch.php?id%3Dpub%253Amaster%26cache%3Dcache%26media%3Dmaster:buletti_tpg_2011avril.pdf+An+analysis+of+Masdar+City%E2%80%99s+communication+strategy+-+Using+speech+act+theory+to+go+beyond+the+corporate+fa%C3%A7ade&hl=en&gl=uk&pid=bl&srcid=ADGEEsqWMEvCp969bBesZOBdNT4M4aBgR-AvDbr-mLfzhv36duDyufGGe0xX8tUljxgg_s4xQhI_KGCLApicElOSzhD5fxflYecBEQd6v5tU7uk9ue4oub6oANfanAp7qp9H0EQPPYm7&sig=AHIEtbTGG-t4htv-rs2ba9Wc27WcHq5A-A
- Del Sol, D., (2010). Skyscraper, or Sustainable Underground Society? (online). Retrieved January 20, 2013, from <http://www.evolu.us/architecture/skyscraper-or-sustainable-underground-society/>
- Heinberg, R., (2010). What Is a Sustainable City??. USA: Published by the Edmonton Sustainability Papers (online). Retrieved December 24, 2013, from

[http://www.edmonton.ca/city_government/documents/Discussion Paper 1 Definitions of Sustainability and Criteria.pdf](http://www.edmonton.ca/city_government/documents/Discussion_Paper_1_Definitions_of_Sustainability_and_Criteria.pdf)

Jenks, M. & Dimbsey, N., (2005). *Future Forms*. Amsterdam: Published by Routledge.

MASDAR, (n.d.). *Building the World's Most Sustainable City* (Online). Retrieved January 25, 2013, from http://www.rpd-mohesr.com/uploads/custompages/15_MASDARCITY.pdf

Maslin, M., (2009). *Future vision of a sustainable zero-carbon world*. UK: Published in the Summer 2009 edition of 'palette', UCL's journal of sustainable cities (online).). Retrieved February 19, 2013, from <http://www.ucl.ac.uk/sustainable-cities/results/gcsc-reports/maslin.pdf>

Meinhold, B., (2010). *Underground Skyscraper is a Self-Sufficient Desert City* (online). Retrieved January 20, 2013, from <http://inhabitat.com/underground-skyscraper-that-heals-the-scars-of-open-pit-mining/>

Thorpe, J., (2009). *Masdar City - Sustainable Development* (online). Retrieved January 25, 2013, from <http://ebookbrowse.com/190111-024823-2009-thorpe-masdar-project-pdf-d245441816>

Wikipedia, (n.d.). *Sustainable City* (online). Retrieved December 20, 2013, from [http://en.wikipedia.org/wiki/Sustainable city](http://en.wikipedia.org/wiki/Sustainable_city)

ACCEPTABLE AND UNACCEPTABLE GROWTH OF INDUSTRIAL AGGLOMERATION IN URBAN ENVIRONMENT. BAGHDAD AS CASE STUDY

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ABSTRACT

Recent empirical studies of agglomeration economies indicate that economic, social and physical policies are the driving forces affecting spatial distribution of urban environment. Industrial agglomeration is influenced by agglomeration growth and spatial concentration and localization and urbanization economies have a significant impact on the industrial employment growth. This paper will be focus in the impact of industrial agglomeration growth on spatial concentration to determine the trend and size of industrial localization. Census data for industrial employment are used in Location Quotient and Employment Multiplier Analysis. The findings indicate that concentration indicators for two types of industries, basic and non-basic industries in Baghdad are divided in four levels. The first, basic industries are concentrated and recorded an increase in concentration and an acceptable growth in employment. The second, basic industries recorded a decrease in concentration and an acceptable growth employment. The third, non-basic industries recorded an increase in concentration and an acceptable growth in employment. The fourth, non-basic industries are non-concentrated and recorded a decrease in concentration and an unacceptable growth in employment.

Keywords: *Agglomeration growth, Industrial concentration, Agglomeration Multiplier, Employment Multiplier*

INTRODUCTION

After the urban industrial agglomerations grow and prosperity by different economies, these economies in turn attract more organizers to move their industrial activities to settle within the influence areas of agglomeration. The facilities are available, especially, marketing outlets, qualified personnel, transport networks, communications and government administrative services. Accordingly, the urban economies often make the main cities that are more suited to settling of industrial agglomerations than the rural and semi-urban, (Hoshiar, 2006).

Also market size can be maximized by either locating in large urban areas or on high access transport corridors, firms employing standardized production processes (as in Indian industry) would tend to offset costs of high density (high wages and rents) by moving to secondary centers. If the net benefits of locating in dense urban areas are marginal, then why do we still see high levels of industrial activity in big cities? There is main reason for this. It is the large inequality in the spatial distribution of transport infrastructure linking urban areas, (Somik, et al., 2004). But the congestion and strengthened competition with the service sector associated with urbanization are the strong built-in forces that deter the continuous concentration of manufacturing industries in major urban areas. Indeed, if the localization and urbanization economies work without arousing countervailing forces, the industrial concentration will tend to continue without interruption, (Yukichi&Keijiro, 2000).

Metropolitan cities are extensive labor market with diverse skills, and this is one of the features that encourage industrial agglomeration in the urban environment. Firms employ all types of worker. A business area may be formed in the center or in the suburban segments. A monocentric configuration arises when the commuting cost is small and heterogeneity of workers is large. The center has an advantage in that firms can employ workers of all types at a mean wage level because workers of all types reside in the neighboring area of the center, (Ryosuke, 2007). Hence, heterogeneity in general works as centripetal force, (Fujita and Krugman, 1995). The long-term effects of the agglomeration economies on productivity, one of its effects, productivity growth is more prominent in denser areas due to improved efficiency through localization economies. In addition, the area in which innovation occurs gradually expands outwards from the core area. This is because the negative influences from congestion outweigh the agglomeration economies, (Eiji&Inyong, 2007).

As the urban industrial agglomeration has advantages also there are disadvantages, diseconomies such as wages, rents, and the cost of congestion, pollution, etc. Wage differentials drive the evolution of the economy & also it cause people to move. In *Edge Cities*, for example, workers and firms move out of a central city and towards the suburbs of the metropolitan area primarily because of increasing land rents, (Ludwig & Neer, 2008).

Firms are more likely to locate greenfield plants near larger markets, i.e. there are a positive relationship with the amount of manufacturing activity that is already taking place and the total working age population in the county. The firm will choose to locate its new plant in the most profitable location, taking into account any the regional selective assistance grant which it expects to receive, and any benefits it receives from locating near similar firms. The diversified regions more attractive than specialized regions & Firms may also benefit from locating in areas where the mass or density of economic activity is high, (Michael et al., 2007).

Population intensities are unhomogeneous spatially, so it is highest in urban areas & it is lowest in rural regions and also the demand, returns of potential selling are differing in markets, from a place to other, (Richardson, 1969). "Information about an area's future population is incomplete without a parallel understanding of the local economy that largely shapes its future." (Klosterman, 1990). The above quote from Klosterman helps to illustrate the importance of coupling local population estimates or forecasts to an in-depth knowledge of the local economy, especially local employment estimate, in industry sector.

Spatial agglomeration is conducive to growth. The complementary of growth and spatial concentration, if found to be a general phenomenon, has strong implications for economic policy, as it entails a special kind of efficiency-equity trade-off, whereby policy makers may be forced to choose between supporting lagging regions and promoting growth at the national level, (Martin, 1999). The diversified regions more attractive than specialized regions & firms may also benefit from locating in areas where the agglomeration or density of economic activity is high, (Michael et al, 2007). If the local economy is strong, it means there is forecasting of new jobs in future. They main question, how the agglomeration growth and spatial concentration help local economy to create new jobs in future? So, the paper focuses to study & analysis the positive directions of agglomeration growth and spatial concentration in Baghdad. Depending on location quotient analysis and employment multiplier analysis. Using location quotient to identify the most concentration industries and to estimate basic employment industries, then using employment multiplier analysis to predict change in total employment as a result to agglomeration growth and spatial concentration.

METHODOLOGY

LOCATION QUOTIENTS ANALYSIS

Location Quotient, most indicators are used in the analysis of the spatial structure of the industry, especially in the calculation and assessment of the relative specialization of the region in a particular industry, and the calculation of the viability of this specialization for long or short period

.Therefore, we must provide the data through time series for some economic indicators such as employment, wages, added value, production,... etc. Must provide data on these indicators at the regional and national level for each industrial branch, most researchers prefer to rely on employment indicator, workers, (Gekham, 1961).And for ease of access to or availability it in the official census of work. Some believe that the use of added value is best for it contains all the factors of production as a total value, (Hamem, 1990).

Location Quotient (LQ) is used to measure the industrial concentration for any industry spatially, by dividing an employment ratio this industry in region upon an employment ratio of the same industry in the country. Location quotient also is used to measure the strength of industrial concentration, comparing with the national average, then to diagnosis the size and trend of concentration for any industry between two periods. When LQ is equal 1 or more than 1, that means, this industry is concentrated in this region or in this city. While, if LQ is less than 1, that means, this industry is not concentrated in this region or in this city. More specifically, industries which score LQ more than 1 such as 1.25, they have strong regional advantage. They can export the production surplus to the another regions. Specifically, industries which score LQ more than 1 such as 1.25, they have strong regional advantage.

They can export the production surplus to the another regions. While, the industries which score LQ less than 1 such as 0.75, they have not regional advantage. Moreover, there are deficit must import from the another regions. The first which have LQ more than 1, they sate the regional need and create surplus for exporting. While, the second which have LQ less than 1, they cannot sate the regional need, so, the region depends on importing from the another regions to fill deficit.

Location Quotient has been applied in location analysis and in regional development. During the 1940s, the National Resources Planning Board (NRPB) calculated LQ for each manufacturing activity for every state (Izard, 1960). Walter Izard, an eminent regional scientist and economic geographer, believed that LQ could produce a rough benchmark in the analysis of localization in an area. Mayer and Pleeter proposed (1975) some theoretical guidelines for calculating the location quotient with respect to import-export analysis.

The LQ is defined as:

$$LQ = X^*/Y^*$$

Where:

X* = percentage of a selected subset within a small area.

Y* = percentage of the aggregate base within the small area.

Or Location Quotients

$$\frac{e_{ir}}{\sum e_{ir}} \div \frac{E_i}{\sum E_i}$$

e_{ir} = employment in some industry (i) in some region (r)

$\sum e_{ir}$ = total employment in the region

E_i = national employment in some industry (i)

$\sum E_i$ = total national employment

EMPLOYMENT MULTIPLIER ANALYSIS

Definitions

Basic Industry - Those industries that produce goods and services, ultimately have been sold to consumers outside the region, or $LQ > 1$.

Non-basic Industry - Those industries that produce goods and services that are consumed locally, or

LQ<1.

Multiplier - Ratio of total economic activity to basic economic activity, or Total employment generated per basic employee

As long as, the region can increase the level of basic employment, therefore over time, it can generate increasing levels of total employment under the impact of employment multiplier (see Avrom, 1991).

$$\text{Multiplier} = \left[\frac{\text{Change in Total Employment}}{\text{Change in Basic Employment}} \right]$$

$$\left(\frac{\text{Change in Basic Employment}}{\text{Change in Total Employment}} \right) \times \text{Multiplier} = \left(\frac{\text{Change in Basic Employment}}{\text{Change in Total Employment}} \right)$$

Using Location Quotients to Estimate Basic Employment

Location quotient = 1 Local production can just satisfy local consumption.

Location quotient > 1 Local production can satisfy local consumption, and the excess is exported. This is a "basic" industry.

Location quotient < 1 Local production cannot satisfy local consumption, and the difference must be imported. Not all of a basic industry is "basic." Only that part of the industry that serves the export market is considered basic. It is that part of the industry that raises the location quotient above 1.0. The location quotient equation can be used to estimate basic and non-basic employment.

$$1. (e_{ir} / \sum e_{ir}) / (E_{ir} / \sum E_{ir}) = 1.0$$

$$2. (e_{ir} / \sum e_{ir}) = (E_{ir} / \sum E_{ir})$$

$$3. e_{ir} = (E_{ir} / \sum E_{ir}) * \sum e$$

Where e_{ir} in this equation is non-basic employment and basic employment is actual minus non-basic employment, (see page 80. Avrom, 1991)

Agglomeration Multiplier as an Employment Multiplier

The simple economic base (employment) multiplier is presented in three different forms, respectively emphasizing different components and roles of the multiplier

Total Employment (T) = Basic Employment (B) + Non-basic Employment (N)

Multiplier Effect (ME) = Non-basic Employment generated (by Basic employment)

OR:

Basic employment multiplied by Non-basic employment per basic employee

OR:

Basic Employment x Multiplier minus Basic Employment

OR:

Basic Employment x (Multiplier - 1)

Multiplier Formulation #1

$$T = B + N$$

$$M_1 = \frac{T}{B}$$

(Multiplier: Total employment generated per basic employee)

Multiplier Formulation #2

$$M_2 = \frac{1}{1 - \frac{N}{T}}$$

Denominator: "leakage coefficient" (the larger this coefficient, the smaller the multiplier)

N/T = "retention coefficient" (the larger this coefficient, the larger the multiplier). This coefficient is the equivalent of the "propensity to consume locally."

Multiplier Formulation #3

$$T = B + ME$$

$$M_3 = \left(1 + \frac{N}{B} \right)$$

[In this formulation, the emphasis is on the N/B ratio and the role of the "1" in multipliers (namely to isolate and preserve the *basic* component in the resulting total employment)] (See Thomas Ott, 1999)

$$ME = B \frac{N}{B}$$

RESULTS AND DISCUSION

To predict the industrial agglomeration growth & spatial concentration for any area, such as Baghdad, there are two reliable methods. Employment Multiplier Analysis (EMA) & Location Quotient Analysis (LQA). Location Quotient Analysis (LQA) is used to measure the concentration levels of industries in study area & to identify the most concentration industries from others, also to identify between the basic employment & non-basic employment. Employment Multiplier Analysis (EMA) is used to analyze how agglomeration multiplies as employment grows under impact of basic employment in industrial sector, & to predict the concentration directions to multiply industrial agglomeration as a total employment multiplier.

Table.1: Industrial Location Quotient in Baghdad for the Period 2000 – 2010

Industrial categories	2000					2010				
	Iraq	%	Baghdad	%	LQ	Iraq	%	Baghdad	%	LQ
Manufacture of food , drinks and tobacco	46028	17.71	24252	23.5	1.32	41125	15.3	12668	17.1	1.1
Manufacture of clothing, leather, yarn and fabric	46676	17.9	24992	24.2	1.35	35883	13.3	19213	15.2	1.1
Manufacture of paper and wood	20632	7.93	8503	8.2	1.03	19098	7.1	7870	6.2	0.87
Manufacture of Chemical and oil refining	37018	14.2	11036	10.6	0.74	23010	8.5	6859	5.4	0.63
Manufacture of Construction materials(Cement bricks)	37047	14.2	16834	16.5	1.16	30770	11.5	13981	11	0.95
Manufacture of metal products, machinery and equipment	70704	27.2	17011	16.4	0.60	117088	43.5	56341	44.3	1.01
Other manufactures	1750	0.6	633	0.6	1	2237	0.8	898	0.8	1
Σ	259855	100	103261	100		269211	100	126830	100	

Source of employment: Ministry of Planning, industrial census for the period 2000 - 2010

Using LQ to identify BE from NBE in manufacturing

LQ: Location Quotients, **BEI:** Basic Employment, **NBEI:** Non-Basic Employment

If location quotient > 1 for any industry, this is a "basic" industry. Also if location quotient= 1 or <1 for any industry, this is a "non-basic" industry. So in our study area, depending on previous identifying between basic & non-basic industries, will be following industries are basic industries, (the manufacture of food , drinks and tobacco, The manufacture of clothing, leather, yarn and fabric, Manufacture of metal products, machinery and equipment), because their LQ >1. In this case the another industries ,(the manufacture of paper and wood, the manufacture of chemical and oil refining, manufacture of construction materials(cement bricks, etc),,other manufactures), are considering non-basic industries, because their LQ =1 or <1, (see table 1).

Agglomeration Multiplier asan **Employment Multiplier**

$$T_{10} = 126830, B_{10} = 97222, NB_{10} = 29608$$

Multiplier Formulation #1 $T = B + N$

$$M_1 = T/B = 126830/97222 = 1.3$$

Multiplier Formulation #2 $M2 = 1/[1-(N/T)]$

$M2 = 1/[1-(29608/126830)]$

$M2 = 1/[1-0.23]$

$M2 = 1/[0.77]$

$M2 = 1.3$

Multiplier Formulation #3

$T = B + ME$

$T = 97222 + 97222 \times 1.3$

$T = 97222 + 126389$

$T = 223611$ Jobs. New total employment after impact of employment multiplier, or agglomeration multiplier indirectly.

POTENTIAL GROWTH OF AGGLOMERATION

The Potential total growth of employment in industrial sector in Baghdad was %76.3; this is a growth ratio close to the double. This is a strong indicator of the rapid increase of industrial agglomeration in Baghdad. Interestingly, the majority of industries had a growth rate of employment is relatively close to each other and with the overall growth of the industrial sector in Baghdad. If we exclude the other industries that have a growth rate %99.22. The convergence rate of growth of industries with each other and to the overall growth rate of industry sector. This is a strong indicator, it leads to clear reality, that the all industries are under the influence of a strong factor pushes for the growth of the industrial agglomeration, namely the high density of population in Baghdad and the diversity of skills were the main factors to employment growth directly, and in the same time to growth of the industrial agglomeration indirectly for all industrial branches. This confirms the arguments of Ryosuk (2007), metropolitan cities are extensive labor market with diverse skills, and this is one of the features that encourage industrial agglomeration in the urban environment.

Table.2: New Share & Potential Growth Under the impact of Employment Multiplier 2010

Industrial categories	Baghdad	%	New share	Potential growth %	Potential concentration (LQ)
The manufacture of food , drinks and tobacco	12668	17.1	38238	76.47	1.1
The manufacture of clothing, leather, yarn and fabric	19213	15.2	33989	76.90	1.1
The manufacture of paper and wood	7870	6.2	13864	76.16	0.87
The manufacture of Chemical and oil refining	6859	5.4	12075	76.04	0.63
Manufacture of Construction materials(Cement bricks)	13981	11	24597	75.93	0.95
Manufacture of metal products, machinery and equipment	56341	44.3	99059	76.17	1.01
Other manufactures	898	0.8	1789	99.22	1

Σ	126830	100	223611	76.30	

Source of employment: Ministry of Planning, industrial census for the period 2010

POTENTIAL INDUSTRIAL CONCENTRATION

The Potential growth of the industrial agglomeration in the all industrial branches in Baghdad is not sufficient evidence to increase the rates of industrial concentration in all industrial branches. Industries that were already settled and concentrated in Baghdad before to calculate employment multiplier, are still at the same case, have $LQ > 1$ or $= 1$ after to calculate employment multiplier, such as, (Manufacture of food, drinks and tobacco, Manufacture of clothing, leather, yarn and fabric, Manufacture of metal products, machinery and equipment & Other manufactures). Also industries which have $LQ < 1$ are still at the same case, after to calculate employment multiplier, such as (Manufacture of paper and wood, Manufacture of Chemical and oil refining, Manufacture of Construction materials (Cement bricks), (see table 2). This confirms the logical and scientific results to calculate of employment multiplier does not impact the results that we obtained from the actual data of the concentration. The meaning, there are harmony and conformity in the concentration findings for all industrial branches between the results of the actual data and the expected data. The main result is that the industrial agglomeration will increase rapidly in industries which have high industrial concentration, while the industrial agglomeration will remain fixed in industries which have low industrial concentration or that it will decrease over time in Baghdad.

CONCLUSIONS

Manufacture of food, drinks and tobacco, also manufacture of clothing, leather, yarn and fabric, they have recorded a significant stability & spatial localization. That had come as a natural result of increasing demand for the huge human mass in Baghdad, because it is a large consumption market for food products, clothing and tobacco. These are the most important reasons for localization and concentration in Baghdad. In other words, the growth of these industries is an acceptable spatially.

Manufacture of metal products, machinery and equipment, they consider major source in compensation for all missed employment in the other industries branches. Therefore, they have recorded positive increase in actual growth of employment. Besides that, they are considered settlement industries spatially. That is very clear example to the industrial concentration & localization in Baghdad. In other words, they have an acceptable growth spatially.

Other manufactures, these include local handicrafts, folk industries such as (The gold jewelry industry, Hand-made carpet industry, Hand-made furniture industry, Manual footwear industry, Local clothing industry). They have recorded stability, settlement & a slight increase in employment. The reasons were, these industries require special skills of workers; they are often family skills or family legacy from skills. Moreover, they consider an acceptable industries spatially or they have an acceptable growth spatially.

Manufacture of paper and wood & manufacture of construction materials (Cement bricks), they have recorded decline in localization & they have not contribution in new jobs. Moreover, many of them have been migrated outside Baghdad because they have been polluted the urban environment. On the other hand, these industries require wide area which it unavailable in Baghdad, because Baghdad area is small relatively. Therefore, they consider an unacceptable industries spatially or they have an unacceptable growth spatially in Baghdad.

Manufacture of Chemical and oil refining, most of these industries a public sector industries, they have recorded decline in localization & they have not contribution in new jobs and they are polluting the urban environment. Despite that, they are still continue agglomerating in Baghdad. They have occupied wide areas near the residential areas, such as Aldorah refinery in Aldorah town, south-west of Baghdad & Altajee refinery in Altajee town, north of Baghdad. Therefore, they consider an unacceptable industries spatially or they have an unacceptable growth spatially in Baghdad.

REFERENCES

- Avrom Bendavid-Val, (1991). *Regional and local economic analysis for practitioners*. Praeger, New York.
- Fuji Yamamura & Inyong Shin, (2007). Dynamics of agglomeration economies and regional industrial structure: The case of the assembly industry of the Greater Tokyo Region, 1960–2000. *Structural Change and Economic Dynamics*, 18, 483-499
- Fujita, M., Krugman, P., 1995. When is the economy monocentric? Von Thünen and Chamberlin Unified. *Regional Science and Urban Economics* 25, 505–528.
- Gekham.V.M. (1961). The Geography of Industry in the United State. *Journal of Industrial Geography* .Vol.11.No.6.
- Hamem.Hassan.J. (1990). Industry Movement Criterions. Master's Thesis in Urban and Regional Planning - Baghdad University, Institute of Urban and Regional Planning.
- Hoshiar.M,(2006). *Analysis of Urban and Regional Economic*. DARSFA, Amman, Jordan.
- Isard, W. (1960). *Methods of Regional Analysis* . New York: John Wiley & Sons.
- Klosterman, Richard E. 1990. Community and Analysis Planning Techniques. Rowmand and Littlefield Publishers, Inc. Savage, Maryland. See Chapters 9-13
- Ludwig Chincarini, NeerAsherie (2008). An analytical model for the formation of economic clusters. *Regional Science and Urban Economics*, 38, 252-270
- Martin, Philippe (1999). Public policies, regional inequalities and growth. *Journal of Public Economics* 73 , 85–105
- Mayer, W., and S. Pleeter. (1975). "A Theoretical Justification for the Use of Location Quotients." *Regional Science and Urban Economics* 5: 343-355.
- Michael P. Devereux a, Rachel Griffith b, Helen Simpson (2007). Firm location decisions, regional grants and agglomeration externalities. *Journal of Public Economics*, 91, 413-435
- Richardson, H.W,(1969). *Regional Economics*. Weidenfeld and Nicolson, Part A.
- Ryosuke Okamoto,(2007). Location choices of firms and workers in an urban model with heterogeneities in skills and preferences. *Regional Science and Urban Economics* 37, 670–687
- Somik V. Lall, ZmarakShalizi, UweDeichmann(2004). Agglomeration economies and productivity in Indian industry. *Development Economics Journal*, 73, 643-673.
- Thomas Ott, (1999). *Economic & Business Geography*. A Learning Web, Gunter Krumme.
- Yukichi Mano and KejiroOtsuka (2000). Agglomeration Economies and Geographical Concentration of Industries: A Case Study of Manufacturing Sectors in Postwar Japan¹. *Journal of the Japanese and International Economies*, 14, 189-203

DE-MALLING: A NEW TREND FOR SUSTAINABLE DESIGN OF SHOPPING IN THE LIGHT OF LIVABLE COMMUNITIES

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ABSTRACT

This Research highlights the recent trends of the shopping activity. The study focuses on the importance of the integration of urban fabric and shopping mall. Open space and sustainable design for shopping malls are the rising trends in the world. The enclosed shopping mall separated urbanity and shopping activity from each other. One of the latest regeneration trends is called 'De-malling'. In order to compete with emerging new shopping places, de-malling can promote locality, retail activities, and the practice for good shopping. Opening the existing shopping malls, integrating them within the urban fabric, and continually updating are all approaches towards de-malling. Every shopping mall has different reasons in need of regeneration, which can be functional, managerial or structural. Different regeneration strategies would be necessary for each shopping mall. The study investigates the main principles and approaches for shopping mall regeneration through different examples that would help to put forward the specific strategies for different shopping malls. Finally, a case study is presented as an applied model of the principals and the approaches towards sustainable design of shopping malls.

Key Words: Shopping, Shopping Mall, Urban Public Space, Regeneration, De-malling, sustainable design.

INTRODUCTION

Shopping has been historically preferred to be an outside activity. It has created its own urban realms. The bazaar, the arcade, and shopping streets are all forms of traditional shopping spaces (Kunstwissen, 2001). With the invention of air conditioning, natural light and air could finally be superseded and rendered obsolete, as "ideal" and completely artificial shopping conditions were *enthusiastically* adopted by the public (Leong, 2001:93). Shopping malls were built mostly in the United States of America. By the end of the 20th century the building of large shopping malls has started to shift from the United States of America to other parts of the world (Abu-Ghazalah, 2011:4). These fully-enclosed and environmentally controlled consumption spaces reinterpreted the urban fabric to simulate a city image. "The increasing use of 'green', and urban or ecological conscious affects the design elements of the mall" (The Futuristic Five, 2003). The new trend in shopping mall design is focusing on consumers' desire of greater convenience. In other words, the malls are formed according to customers' lifestyle. The aim of the study is to put forward the importance of de-malling as a new trend of regeneration of shopping malls' as one of the future directions, and to make clear the criteria for successful regeneration of shopping malls. This paper first explores the history of shopping places. Then it introduces an interpretation of public space, its quality, and publicness of shopping mall in which urban spaces are transformed into architectural spaces. The study then focuses on identifying "De-Malling" strategy as one of the recent trends in designing shopping malls. A case study is chosen in the KSA (Kingdom of Saudi Arabia) to be discussed as an applied model. Finally, the paper ends with a number of conclusions in order to improve the shopping malls environments.

SHOPPING PLACES: A TRAIL ACROSS TIME

Over history, shopping places have passed through many transformations and transitions that have great impacts on the trends of shopping and the formation of shopping spaces (Ergunk, 2010:78). The Greek Agora, A large open square, surrounded on all four sides by buildings was the center of town. It was an open "place of assembly" in ancient Greek city-states. Its main function was a place for daily communications and formal and informal assembly, fig.(1). Just like Greek Agora, the ancient Roman forum, was surrounded by temples, basilicas, bathhouses and municipal buildings. It was the center of the civic life. Shopping was one of the activities which took place both in the buildings and in the forum space (Coleman 2007, p.19). The Trajan's Market (in Latin: *Mercatus Traiani*), another important milestone in the evolution of shopping places, was built as an integral part of the Roman forum. It was a revolutionary complex of vaulted spaces for commercial and social purposes. The shops and apartments were built in a multi-level structure providing a new image for urban design, fig.(2).

By the 19th century, the medieval market hall, the eastern bazaar, the fair and the market buildings, were all developed as shopping environments (Ergunk, 2010,p78) The market and town halls were the heart of trading and business activity of the city. They were located along with the market square, in the center of the town, fig. (3). Later, market buildings were no longer combined with town halls. Instead, "market halls were built as large linear structures covering long nave-like spaces, with side corridors lined with booths forming collections of shops", fig.(4),(Coleman 2007, p.22).

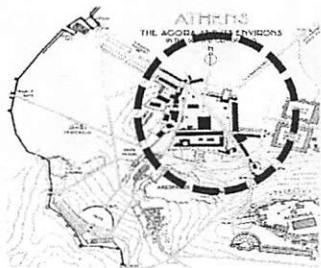


Fig. 1: The Athenian Agora. Plan of the in ca. A.D. 150 (left). The commercial agora was surrounded by porticoes (right). Source: (Agathe, 2013)



Fig. 2: Trajan's Market. Rome. Source: (Wikipedia, 2005)

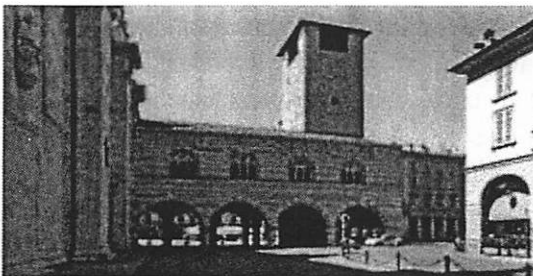


Fig. 3: Palazzo del Broletto in Como, Italy. example for medieval market and town hall. Source: (E.N.I.T., 2013)



Fig. 4: Wroclaw-Rynek, Market Square in Wroclaw, Poland. Source: (Wikimedia Commons, 2005)

In the Middle East, due to a constant flow of foreign and exotic goods, the bazaar first appeared alongside the vital trade routes. Special areas of cities were eventually designated as areas of trade for the establishment of first bazaars. Bazaars were not only for trade, but they were also the social, religious, and financial centers of cities. Alongside the bazaar new commercial buildings appeared. The *wekalat*, a multi-purpose commercial building, and specialized markets such as; the gold market, seeds markets, and others for textile, were remarkable urban structures of the Middle Eastern historic cities. Fig. (5) shows *Wekalet Al-Ghorury* in Al Azhar zone in Islamic Cairo in Egypt. The bazaar continued to develop externally while its internal character and purpose remained the same, fig. (5). As a result, the bazaar maintained its place in modern societies. Fig. (6) Shows *Kapalıçarşı* (Grand Bazaar) of Istanbul, one of the most important examples of eastern bazaar built in the 15th century. It

contains 4000 shops and more than 58 streets. Today, the traditional bazaar type is among preserved and still alive heritages, (Pedersen, 2011:68).

By the 18th century, just before the Industrial Revolution, the shopping streets was developed in Europe. The market places in cities were no longer spatially sufficient for the evolving and the central streets of cities were lined with shops, pubs and coffee shops, where the shops were organized by type into the same street -e.g. Bread Street, Milk Street. The market structure was first appeared at the beginning of the 19th century. It was based on open courtyards with perimeter arcades lined stalls and shops where the first floor was used for storage. Later on, market buildings took advantage of advances in iron and glass construction (Coleman 2007:28). According to Morrison (2004:18), the market buildings were the prototypes for early 19th century arcades.

Later, the Arcade was born with the influenced of Roman and Greek arcaded streets, the Eastern Bazaar from the 16th century. It was the first European building planned primarily to accommodate a collection of shops (Coleman 2007:30). The arcade differed from its preceding in that it was largely naturally lit; either had top lighting from openings in the roof, or had side lighting by clerestory windows above the shops (Coleman 2007:30). The later examples had continuous vaulted glass roof, which influenced architects of multi-use shopping centers in the recent days, fig. (7).



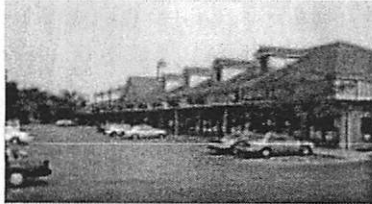
Fig. 5: wekalet El Ghoury, Azhar, (left), and Khan-el-Khalili bazaar Cairo an example of shopping streets the middle east (right). Source: (gogle images, 2005)

Fig. 6: Eastern Bazaar: Istanbul grand bazaar. Source: (New World Encyclopedia: 2008)

Fig. 7: The Cleveland Arcade 1890, Ohio, USA. Source: Fine art America, 2010)

The "Magasin de Nouveaute" and the department store followed the arcade as the first generation of planned shopping buildings. Shopping experience gained new meanings with the glittering interior environments and a new culture of consumption (Ergunk, 2010:78). After the nineteenth century, shopping arcade had become by 1970 a historic building type and city planners and developers started to design large enclosed shopping centers. The architectural and technological innovations have been very effective in the evolution of shopping places. Not only the usage of new materials, like iron and glass; but also the inventions of refrigerator, elevator, escalator, and the air-conditioning systems were all related in the further developments for the following trends (Ergunk, 2010:78). Furthermore, the development of transportation and the increasing car ownership made it easy to reach far settlements for the urbanites. The supermarkets, the chain stores, and the strip malls were all rapidly developed by the opportunities of easy access. At the beginning of the 20th century, shopping centers have been developed in number and diversity of formats, fig.(8).

Eventually, in the mid-20th century, a new style of shopping center was created away from city centers with the rise of the suburb and automobile culture in the United States (Pedersen,2011:23)The USA represented the shopping Renaissance of the later 20th century (Coleman 2007, p.73). Victor Gruen—the European architect of the first shopping mall- proposed the mall as the basic unit of urban planning. Shopping malls were to become “multi-purpose town centers”. Victor Gruen provided interesting insights into the birth of a development concept that reshaped America. By the late 1960s, retail hubs were becoming generally referred to as "shopping malls". Before this, they were usually called a "Center" .The suburban malls influenced the form of many successful regional and super-regional shopping malls throughout the world. At present, there are an impressive number of projects of new shopping centers all over the world, on each continent.



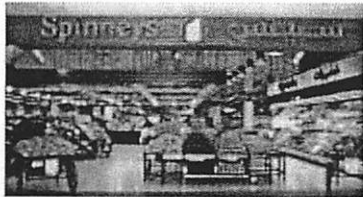
A Strip Mall –Bloomingdale, IL Washington DC. Source: (City Data. Com, 2012)



Chain stores- Walmart. Source:(Walmart 2013)



Suburban Shopping Mall, Thessaloniki, Greece. Source: (Greece photos 2001)



Supermarket- Spinneys : a high-end supermarket chain. Source: (Kuwaitiful (2013)).



TheDeira City Centre shopping mall in Dubai.Source(The National, 2012)

Fig. 8: Different types of shopping spaces through the 20th centurytill now.



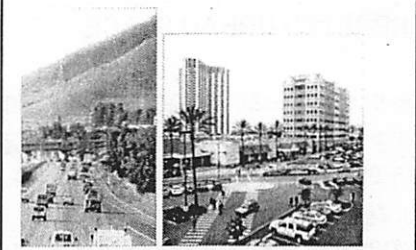

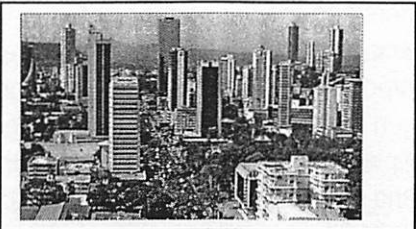
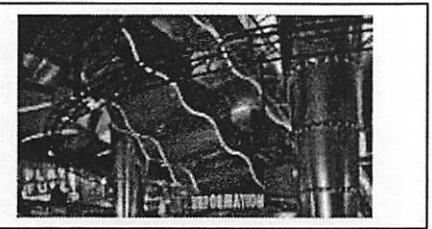


SHOPPING MALLS AS AN INTERPRETED URBAN SPACE

“A shopping mall is defined by the International Council of Shopping Centers in the United States of America as “an enclosed, climatic-controlled and lighted shopping center flanked on one or both sides of walkways by storefronts anchors and entrances. On-site parking, located around the mall could be surface lots or structure (Abu-Ghazalah, 2011:3). To be able to approach the shopping mall and examine what kind of space it provides,it is reasonable first to discuss which criteria it should fulfill.This definition is very broad, and to understand the importance of the public space the definitions of ‘public domains’ is needed to articulate which space is available while spending money in shopping mall or Urban Entertainment Center (Montgomery, 1998:96). The definition of the “public domains”is“those place where an exchange between different social groups is possible and also actually occurs” (Hajer2000:11). Successful urban places mustcombine quality in three essential elements: physical space, the sensory experience and activity(Montgomery,2006:15).Shopping malls, with their fully-enclosed and environmentally controlled consumption spaces, reinterpreted the urban fabric to simulate a city image. Inside the walls a new city is created, where people shops, eats, entertains, and do many activatesseparating urbanity and shopping activity from each other. The mall area itself is usually surrounded by commercial development. The area around the mall is sometimes referred to as an “edge city”, a self-sustaining city within the suburbs (Montgomery, 1998:96).

Lynch (1960, p.46) classified the contents of city elements, which are preferable to physical forms, into five types of elements: nodes, edges, paths, districts, and landmarks. In shopping malls, the nodes represented in city squares are substituted by atriums; the edges are the front façades of the shops and stores; the paths are streets; the districts are different exemplified in the functional commercial zones; and the landmarks are special commercials, table (1). Thus, Shopping malls tend to be an alternative to the city center. However, it is not enough to reinterpret the urban fabric inside the shopping mall to achieve the genuine urbanity. The city elements are converted into interior space elements to create "an illusion of city space" (Birol 2005, p.424). The public space quality or the publicness of shopping mall is a critical issue. It is only a simulated urbanity that is stuck inside a box. Video-surveillance has become particularly common in spaces of consumption: shopping malls, the main shopping areas of city centers and inside individual shops. As malls are often privately owned, shopping malls in particular often have an extremely high level of surveillance, and most video-surveillance systems are operated by private security firms. The spaces of consumption become 'aestheticized' by exclusion (Duncan, 1996: 129), and the urban experience is 'purified' (Sibley, 1995: 78).

Apparently public spaces are not public for everyone – public space can be seen as if it 'refers

Table 1: Shopping malls as an interpreted urban space – city elements of Kiven Lynch. Compiled upon Birol's (2005, p.424)

City Element (Lynch)	City Space	Shopping Mall
Nodes Strategic spots (Plazas & squares)		
Edges		
Paths		
Districts		
Landmarks		

to places under public scrutiny' (Domosh, 1998: 209). An enclosed shopping mall without any connection with urban fabric cannot be considered as urban public space. However, despite the ongoing arguments on shopping malls' urbanity and publicness from the very beginning of their development, shopping malls' "city space qualities" cannot be denied. The main reason for the

emergence of new trends for shopping mall design is to be more sustainable and more livable achieving genuine urbanity.

DE-MALLING: A NEW TREND FOR REGENERATION AND SUSTAINABLE DESIGN OF SHOPPING

"Shopping is a lively activity and shopping malls are living structures"(Ergun, 2010: 139). Shopping malls have a life cycle: birth, growth, maturity, and decline; even rebirth. The life cycle concept identifies changes over time in the characteristics of this phenomenon; and as a result, developers and retailers would have opportunity to plan their strategies to respond to the changing conditions of the retail industry(Lowry 1997:77). Urban regeneration, or "Urban Renewal", takes place when the physical, social and economic characteristics of urban areas have been rebuilt as a part of a strategic redevelopment plan. Urban regeneration typically goes beyond the redevelopment of the physical area of a location and tackles the social, economic, planning, construction and management activities as well (urbanregeneration.net, 2009). These elements of urban regeneration are brought together to improve the social sustainability, economic stability. The environmental impacts of urban regeneration should be taken into account. That can help to improve the sustainability of the urban landscape it occupies.

The key factor for long term success requires a consistent assessment of regeneration projects. Where regeneration projects meet their initial acceptable levels of success they need reliable and sustained support from the public and private sectors over an extended period of time (Lowry, 1997:79). The American congress of New Urbanism reported that:" the first-generation of regional enclosed mall had become mostly obsolete, and so called "dead malls", due to the development of a newer, larger enclosed mall in close proximity" (CNU, 2001: 4). "De-malling is the new trend for regeneration transforming the retail landscape by integrating shopping centers into neighborhoods rather than walling them off from nearby residents." (Ergun, 2010:187). In recent years, open space and sustainable design for shopping malls became the rising trends in the world. A major process of change is taking place in the shape and structure of the city. Today, the integration between urban fabric and shopping mall is becoming more important. Various activities related to work, shopping, recreation and leisure have moved to areas that in the past were considered the inner-urban space of the city limits. So, the new motivations of designing shopping malls are to be open, integrating with urban fabric and continually updating themselves to compete with the emerging shopping places. This recent regeneration trend is called 'De-malling'

PRINCIPALS AND STRATEGIES

Every shopping mall has different reasons in need of regeneration, which can be functional, managerial or structural, so, different regeneration strategies would be necessary for each shopping mall. Externalizing, mixing and multiplying, "going green", and adding transit are four common methods for de-malling of shopping malls. Externalizing, as a strategy, means to reintegrate the mall back into the urban fabric that has grown up around them in recent decades. So, externalizing is: "integrating local grids and shopping mall accesses, designing for the pedestrian instead of automobile, finding new ways of utilizing public transit" (Taylor 2002, pp.49-50). This strategy aims to improve accessibility and urbanity of the shopping mall. Some types of shopping malls have the same brands of shops and even have the same shop window designs. Over time shopping malls have developed more and more like each other. Mixing and multiplying, as a regeneration strategy, would lead to diversity in types and scales of shops mixing national stores, regional stores and local stores. In other words, using "mixing and multiplying" offers uniqueness and diversity which would provide "sense of place" and vitality. The third strategy is "going green", which means recognizing that people like to be at outdoors. So, to create outdoors, the ceiling can be opened or parking area and leftover spaces around shopping malls can be redefined for various activities. In "adding transit" strategy, a community-friendly transit provides pedestrian vitality. Adding transit provides accessibility, increases urban fabric integration of shopping

mall socially and pedestrian vitality. At existing shopping centers, the effect of blank walls facing streets or key pedestrian routes should be reduced through the use of retail liners composed of smaller stores that can animate the street and enhance the walk for pedestrians (Transit-Supportive Guidelines, 2011). The interpretation of these strategies is indicated in table (2), which summarizes the principals of each strategy through demonstrating and analyzing three different types of shopping malls in North America; Columbus Commons Mall fig.(9), Horton Plaza Mall fig.(10), and West Edmonton Mall fig.(11).

CASE STUDY OF AL-HEJAZ MALL- JEDDAH- KSA

Although shopping mall development is not a recent process in many countries-particularly the USA and the United Kingdom, it took few more decades for malls to appear as part of the urban scene in the middle east. Located in Al-Bawadi District, Al Hijaz Plaza in Jeddah is one of the oldest malls in the city of Jeddah in Saudi Arabia. The mall was firstly a traditional shopping street (Eastern Bazaar). But with the booming movement of oil and gas profits, the timing was very appropriate, both for the developers and for consumers searching for new consumption patterns and sites. The first phase of development, known as Al Hijaz I was developed in 1988. The streets were covered by a fiberglass vaulted ceiling. This was followed by the second phase in 1992 converting the open urban context into an enclosed building. This radical change was followed by the development of Al Hijaz II. Mostly patrons looked for jewelry and unique clothing stores. Altogether, Al Hijaz I and II have become home to about 300 stores. The mall was located within a commercial district where many markets and department stores are distributed keeping the businesses growing.

In 2012, the owners proceeded in a new renovation for the mall. As a member of the design team, the researcher has involved in this project. It was not easy to define and categorize physical, social, and economic reasons separately for regeneration. However, outdated finishing materials of shopping mall seemed like a physical reason at first, but it was obvious that the old image and decreased comfort would be socially unattractive which made it a social reason as well. Also, outdated materials could cost repair expenses and brought out economic reasons. Consequently, competition; physical; social; and economic reasons of regeneration were connected to each other. The project duration was designated to extend from 2012 till 2014. The Project goal was: "to make Al- Hijaz Mall a lifestyle mall. A place trusted by families for a safe, enjoyable and pleasant shopping experience for more future decades to play a critical role in lives". Thus, two scenarios were proposed as follows:

Alternative 1: Mixing and Multiplying Strategy: Provide "sense of place" and vitality by:

- Adding streetscape furniture such as (plants, lighting fixture and seating areas
- Offering diversity in types of shops and scales

Alternative 1: Externalizing Strategy and Green Design

- improves accessibility and urbanity of the shopping mall
- Adding an open plaza for national and traditional festivals
- A plaza will be designed to run events and festivals every year whether its spring or summer breaks, Mother's Day, back-to-school season or Ramadan. The new life style mall will add ambiances of excitement and energy that will help the mall meet the requirements of contemporary and future times.

Fig. (12) shows a part of the de-malling project of Al-Hijaz Mall in Geddah, KSA.

Table 2 : De-Malling - Strategies and principals

ELEMENT OF COMPARISON	Project/Shopping Mall
<p>Type</p> <p>Strategy&Principals</p> <p>S</p>	<p>Inner-city shopping mall</p> <p>Externalizing Going Green</p> <ul style="list-style-type: none"> - Reintegrate the mall back into the urban fabric. - designing for the pedestrian instead of automobile parking area and leftover spaces around shopping malls can be redefined for various activities (in this case a green park was created) - improves accessibility and urbanity of the shopping mall  <p>Fig.9: Columbus Commons Mall, Ohio, USA. Source: Columbus Commons, 2013)</p>
<p>Type</p> <p>Strategy&Principals</p>	<p>Hybrid Mall (In & out Mall)</p> <p>Mixing And Multiplying, Going Green</p> <ul style="list-style-type: none"> - provide "sense of place" and vitality, •Providing a Pedestrian –Friendly Outdoors - diversity in types of shops and scales - ceiling can be opened - create outdoors (in this case: the restoration of historic park)  <p>Fig.10: Horton Plaza Mall – The redevelopment project 2011-2014. Source:(Horton Plaza, 2006)</p>
<p>Type</p> <p>Strategy&Principals</p>	<p>(Out Of Town- A Life Style Mall)</p> <p>Design With Transit</p> <ul style="list-style-type: none"> - Acommunity-friendly transit - increases urban fabric integration of shopping mall socially . - Provides pedestrian vitality - mixed uses :recreational spaces, retails, offices, and residential .  <p>Fig.11: West Edmonton Mallin Edmonton, Alberta, Canada.Source: (WEM ,2007).</p>

Al-Hijaz Mall –Jeddah, De-Malling project-Stage I



Before



- Very long elevations without shading or any elements that attract customers to the mall

After

Alternative I

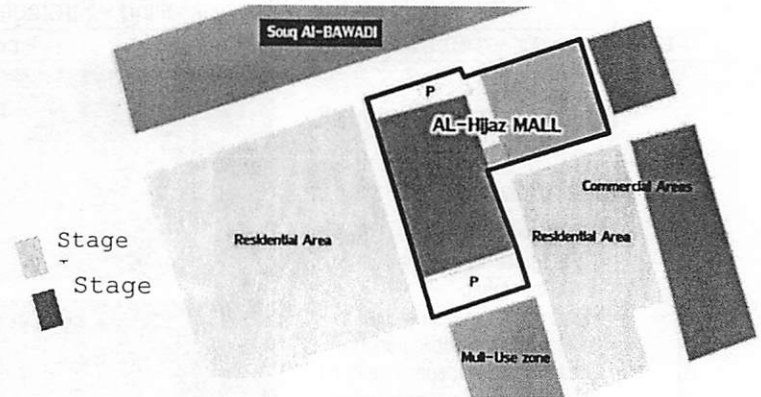


- Providing a Pedestrian –Friendly Outdoors by Adding shaded Arcades, window shopping

Alternative II



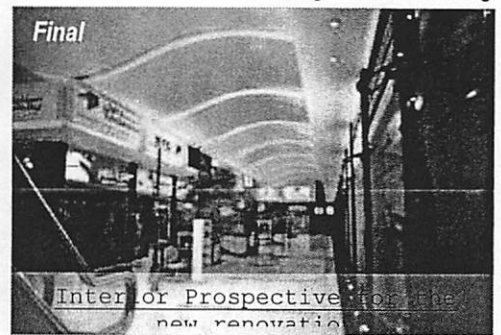
- Creating alifestyle Center by Adding a vibrant ambiance, colorful facades, landscape, and commercials offering a new updated looking for the mall and increase the sustainable design principles with an openairconfiguration.



Draft

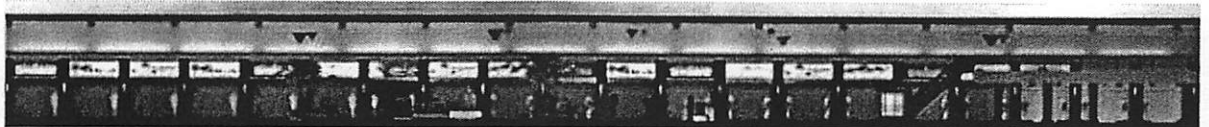


Existing out- dated finishing



Final

Interior Prospective for the new renovatio



Interior section After

Fig.12: Al-Hijaz Mall Demallin Project- Case study. Source: the researcher

CONCLUSION

Starting with the ancient open market places, shopping environment has always been defined as “a public space” and an urban area not only for trade but also for communication. Contemporary shopping spaces are, in essence, transformed forms of traditional urban spaces. Meanwhile, the qualities, which define ‘place’ in traditional city, are inherited. The degree of urban public space quality of a shopping mall directly affects its success; either the urbanity is reinterpreted inside the shopping mall or in case of integration of urban fabric and shopping mall. Each shopping mall has different style and consequently different reasons for regeneration. These reasons could be functional, managerial or structural, so, different regeneration strategies would be necessary for each shopping mall. De-malling is a new trend used by developers that define how to recast an enclosed dying mall into something new. The recent strategies for shopping mall regeneration are formed according to recent trends in

shopping places design. Externalizing, mixing and multiplying, "going green", and adding transit are four of the most common methods of de-malling for shopping. The renovation of the Al-Hijaz mall in Saudi Arabia was taken as a case study. The strategies and the principals of de-malling were applied on the project bringing a number of design solutions towards sustainable design. This mall became phenomenal with its expansions and future plans of expansions. The combined environments in a single center give the customers the needed convenience by providing a wider range of retail under the protection of enclosure along with the natural ambience and visually richer environment of the external street. The project is in process proving that competition is the accelerator for regeneration process. All factors of regeneration are integrated increasing urban and ecological conscious affecting the design elements of the mall. When the trends change in future, the strategies will be developed accordingly. The successful shopping malls and shopping places will be models and competitors for the ones that need to be regenerated in the future.

REFERENCES

- Abu-Ghazalah, S., Ali A., G. (2011). The impact of shopping mall upon the future of urban planning in Greater Amman. Journal of Architectural and Planning Research (JAPR). King Saud University.
- Bach, A. (2009). Ten Principles for Rethinking the Mall. Retrieved May 2013 from http://www.slideshare.net/John_J_Connors/ten-principlesforrethinkingthmall
- Beyard, Michael D., Mary Beth Corrigan, Anita Kramer, Michael Pawlukiewicz, and Coleman, P. (2007). Shopping Environments: Evolution, Planning And Design. Architectural Press, Oxford, USA.
- Birol, G., (2003), Evolution of Trade Centres in Relation to Changing Trade Activities, Retrieved May 2013 from: <http://w3.balikesir.edu.tr/~birol/abstract.pdf> (12.12.2009).
- CNU, (2001). Congress for the New Urbanism, Greyfield Regional Mall Study. Global Strategic Real Estate Research Group. Cited in: Bach, A. (2009). Ten Principles for Rethinking the Mall. Retrieved May 2013 from http://www.slideshare.net/John_J_Connors/ten-principlesforrethinkingthmall
- DVRPC (2005). (Dalaware Valley regional planning commission). Redesigning shopping centers in the Dalaware Valley. Retrieved May 2013 from: <http://www.dvrpc.org/reports/05023.pdf>
- Ergun K. B. (2010). Evolution Of Shopping Malls:Recent Trends And The Question Of Regeneration. M.Sc. Thesis. Çankaya University. Retrieved Feb. 2013 from <Http://Www.Academia.Edu/299926/Evolution-Of-Shopping-Malls-Recent-Trends-And-The-Question-Of-Regeneration>
- Fitzpatrick, D. (2012). Victor Gruen, Was An Urbanist. Retrieved May 13, 2013 from <Http://Reurbanist.Com/2013/05/The-Gruen-Effect-Victor-Gruen-And-The-Shopping-Mall/>
- Gaye, B. Rol. (2003). Evolution of Trade Centres in Relation to Changing Trade Activities. PHD Thesis, Turkey. Retrieved May 2013 from <http://w3.balikesir.edu.tr/~birol/abstract.pdf>
- Greece photos (2001). Suburban Shopping Mall, Thessaloniki Greece., Retrieved May 2013 from: http://www.theodora.com/wfb/photos/greece/greece_photos_05.html
- 360 Cities (2004). Wekalet El Ghoury, Azhar, Cairo, Egypt. Retrieved May 2013 from <Http://Www.360cities.Net/Image/Wekalet-El-Ghoury-Hall-Cairo>
- Hajer, M &Reijndorp, A. (2000). In search of new public domain. Nai Publishers.
- Koskela, H.(2000). The gaze without eyes':video-surveillance and the changing nature of urban space. *Progress in Human Geography* VOI.24(2) pp. 243–265. Retrieved May 2013 from <http://old.geog.psu.edu/courses/geog497b/Readings/Koskela.pdf>
- Leong, S.T., (2001). And Then There Was Shopping, Harvard Design School Guide to Shopping,

- Director Koolhaas, R., Taschen GmbH, Köln, 92-127.
- Lowry, J.,R., (1997).The Life Cycle of Shopping Centers, Business. Horizons. No: January-February. 77-86. Koolhaas, R., Taschen GmbH, Köln, pp.128-155.
- Lynch, K. (1960).The Image of The City. MIT Press, Cambridge.
- Montgomery, J., (1998). Making a City: Urbanity, Vitality and Urban Design, Journal of Urban Design, Routledge, London. Vo. 3(1.). PP. 93-116.
- Montgomery, J. (2006).Community strengthening through Urban sociability. Retrieved May 2013 from: http://www.dpcd.vic.gov.au/data/assets/pdf_file/0019/30655/Community_Strengthening_through_Urban_Sociability.pdf
- Morrison, K.A., (2004), English Shops and Shopping: An Architectural History. Paul Mellon Centre, UK.
- New World Encyclopedia (2008). Eastern Bazaar Istanbul grand bazaar. Retrieved April 2013 from Http://Www.Newworldencyclopedia.Org/Entry/Bazaar#Bazaar_Of_Tabriz.2c_Iran
- Pedersen, S. (2011). The shopping mall as a public space. Retrieved May 2013 from
- Rol, G., B_ (2003). Evolution of Trade Centres in Relation to Changing Trade
- SalhanyP. (2005). Malls Into Mainstreets, An In-Depth Guide To Transforming Dead Malls Into Communities . A report by the Congress for the New Urbanism in cooperation with the United Stated Environmental Protection Agency. Retrieved May 2013 from <http://www.cnu.org/sites/files/mallsintomainstreets.pdf>
- Taylor, M.J., (2002). Repositioning the Older Shopping Mall, Sprawl and Public Space: Redressing The Mall. ed. Smiley, D.J., Robbins, M., Priceton Architectural Press, New York, USA,pp.49-50.
- Transit-Supportive Guidelines (2011). Large Shopping Centres and Big Box Retail . Retrieved May 2013 from <http://www.mto.gov.on.ca/english/transit/supportive-guideline/specialized-uses.shtml>
- UrbanRegeneration.net(2009). An Introduction to Urban Regeneration. Retrieved May 2013 from <http://www.urbanregeneration.net/>
- Walmart (2013). Walmart Worst February Since 2006. Retrieved June 2013 from: <http://www.jonelyn.com/tag/walmart/>
- WEM (2007). West dmonton Mall, Edmonton, Alberta, Canada. Retrieved May 2013 from <http://alpinemortgage.ca/blog/wp-content/uploads/2010/05/wem-water.jpg>
- Wikimedia commons (2005). Wroclaw-Rynek, Wroclaw, Poland. Retrieved May 2013 from <Http://Commons.Wikimedia.Org/Wiki/File:Wroclaw-Rynek-7.2005.Jpg>.
<Http://Magazine.Hotelstgeorge.lt/>
- The National (2013). Dubai's Deira City Centre set to get Dh22 million facelift. Retrieved June 2013 from:http://www.thenational.ae/deployedfiles/Assets/Richmedia/Image/SaxoPress/AD20130328186004-1-Shoppers_walk_t.jpg
- Kuwaitiful (2013). Spinneys Plans to Open in Kuwait. Retrieved June 2013 from: <http://kuwaitiful.com/wp-content/uploads/2013/04/spinneys-grocery-store.jpg>
- Columbus Commons (2013). Columbus Commons.Mall.Retrieved May 2013 from <http://www.columbuscommons.org/about/history/>
- Rory, J. (May 22, 2011). Burjuman Mall Set For Shake-Up. Retrieved March 2013 from <Http://Www.Thenational.Ae/Business/Retail/Burjuman-Mall-Set-For-Shake-Up#ixzz2wz9jx562>
- Horton Plaza (2006). Horton Plaza. Retrieved April 2013 from <http://.info/wp-content/uploads/2009/10/Horton-Plaza-Mall.jpg>
- Agathe.Gr (2007). The Athenian Agora. Retrieved May 2013 from <Http://Www.Agathe.Gr/Overview/>
- City data.com (2012). Bloomington, Illinois. Retrieved May 2013 from: <http://www.city->

- data.com/city/Bloomington-Illinois.html
E.N.I.T. (2013). At the Foot of the Alps. Retrieved May 2013 from <http://www.italiantourism.com/discov13.html>
- Fine Art America (2010). The Cleveland Arcade. Retrieved May 2013 from <Http://Fineartamerica.Com/Featured/The-Cleveland-Arcade-ii-Clarence-Holmes.Html>
- Kunstwissen, de (2001). Shopping. Retrieved May 2013 from http://www.kunstwissen.de/fach/f-kuns/a_allg/shop1.htm
- Spinoso Real Estate Group (2013). De malling. Retrieved May 2013 from <http://www.spinosoreg.com/de-malling/>
- The Futuristic FIVE (2003). Retrieved May 2013 from <http://nreionline.com/mag/futuristic-five>
- Wikipedia (2004). Traiansmarket. Retrieved May 2013 from <Http://En.Wikipedia.Org/Wiki/File:Traiansmarket.Jpg>

IDENTIFICATION OF ELEMENTS AND CRITERION IN THERAPEUTIC GARDEN DESIGN TOWARD LIVEABLE CITY

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ABSTRACT

Urbanization in the cities has provided opportunities for employment, education and socio-economic development, it has also brought about a number of health problems. Cities in Malaysia and other developing countries are struggling with the same issues such as healthy city, health transitions and so forth. Thus, increase numbers in health problems and rapid urbanization cause the need of creating cities that liveable for people to live. Liveable cities offer a high quality of life, and support the health and wellbeing of the people who live and work in them. In terms of liveable cities, they also feature attractive built and natural environments such as therapeutic garden that specially designed to meet the physical, psychological, social and spiritual needs of the people especially those who have health problems. Basically, therapeutic garden design relate to the health problem; of stress, as the relief of stress helps to bolster the immune system and stimulate the body's natural healing proclivity. Hence, this paper seeks to identify the needed elements and criterions in the therapeutic garden. The identification of the needed elements and criterions is seen as important factors in enabling future therapeutic garden design to be benefit to human health and increase the quality of life in cities.

Key Words: *Health problem, liveable cities, therapeutic garden, elements and criterions.*

INTRODUCTION

Liveable city is a very subjective word as different people have their own opinion on that subject matter. According to Timmer and Seymoar (2004), the liveable city is referring to the quality of life as experienced by the people who live there. While, Douglass (2004) stated that a liveable city is molded by the conditions of their natural and built environment in which are healthy, pleasant and socially just living. For this research, the liveable city is focused on therapeutic garden in healthcare as a natural and built environment that purposely created to meet the physical, psychological, social and spiritual needs of the people especially those who have health problems. Furthermore, Kaplan and Kaplan (1989) have discovered that even just everyday small green and natural environment in urban context benefitted for mental well-being and relief from stress. In Kaplan's attention restoration theory, ART (Kaplan, 1995), people recover a depleted directed intentional capacity with particular characteristics/criterions of natural environment. Thereby, a healthcare setting with a therapeutic garden is designed for specific processes such as regaining or improving health on a physical, mental, and/or social level for people in a healthcare facility (Hartig and Cooper Marcus, 2006). They claimed that a garden impossibly cure a disease. However, a terminally ill patient would value a hospice garden as a place for contemplation. Visitors and staff who are not ill will value a garden for grieving or a restorative respite from stressful caring demands (Hartig and Marcus, 2006).

Garden in general features natural visual setting that reflects life such as plants, trees and flowers. Elements that arouse the senses such as sounds of water, fragrance of flowers, gentle breeze and the feel of sunlight that (Epstein,2006) featured in the health garden enhance the visual features. English et al. (2008) believe that therapeutic landscape is sites which are associated with healing and treatment. They describe the therapeutic landscapes as the space that physical, built environment, social conditions and human perceptions combine to produce an atmosphere which are conducive to healing. These sites evoke "emotional geographies" which play a role in shaping and maintaining the therapeutic landscape. Emotional geographies are the emotional meanings of places. These emotional geographies consist of a place or space which has all the necessary elements in nature. In a wider perspective it could be place that are peaceful, relaxing and far from the hassle and bustle of the busy life. It is a place that link human to nature i.e. a place that evokes positive feeling when the sound of birds, running streams, the soft fresh breeze, fragrances and beautiful landscapes. In reality the earth is the natural healing garden from the beginning of time.

Therapeutic garden is generally built up for inhabitants of the healthcare facilities such as in children's institutions, psychiatric hospitals, hospices and nursing or residential homes. However, there are also specific therapeutic garden for certain diseases such as Alzheimer and cancer. For the Alzheimer's disease, it will stimulate senses and promote positive emotions and memories. Such garden not only used for the patients as visitors and staff may also use and value it as a place for a relaxing break from stressful work and for grieving (Sherman, Varni, Ulrich and Malcarne, 2005). The impacts of therapeutic garden can be divided in two levels which are: 1) direct role of the environments for recovery process and 2) indirect effect of the environments in enhancing quality of care and helping patients feel restored (Malcom, 1992). In spite of therapeutic garden can give lots of benefit to the user, the definition of elements and criterions involved are still quite broad and thus problematic, particularly when trying to apply the results to practice and to the new design of new environments. Furthermore, in Ulrich's work (1999) stated that the disagreements between patients' and designers' view on what is needed in the garden might have undesirable effect especially on acutely stressed or mentally ill people. When planning to design therapeutic garden, it is crucial to know the needed elements and criterions of the garden that can contribute to human health and increase the quality of life. Method used for conducting this study is by reviewing previous papers, journals, and books on therapeutic garden, healing garden, healing environment, green care and so forth.

NEEDED ELEMENTS AND CRITERIONS OF THERAPEUTIC GARDEN FOR ADULTS

Adults have a strong tendency to choose natural landscape scenes than urban view when they are stressed or depressed. The elements of nature such as trees, grass, water, visible sky, rocks, flowers and birds were mentioned to help them feel better (Ulrich, 1977; Balling and Falk, 1982; Cooper-Marcus, 1995; Olds, 1989). Whitehouse(2001) has also identified some of the elements that were claimed by the adult garden users as helpful. The elements were stated in order of most to least: (1) the sound of running water; (2) the presence of bright colors; (3) being outside in a garden; (4) the flowers, plants, and greenery; (5) artwork specific to the garden such as the windmill, shadow wall, dinosaur, constellation wall, and animal tiles; (6) feeling fresh air, sunshine, and breezes, (7) the sense of enclosure provided by the walls; and (8) the opportunity for multisensory stimulation. Sherman (2005) also found out that the most popular elements for adults and children in the garden are the elements that can allow interactions between person and environment such as dipping fingers into the water and floating objects down the river, and also the elements that can promote interactions between person to person like children play together, parent walk, climb and sit together with their children. These elements allow people to interact both with the garden and each other.

NEEDED ELEMENTS AND CRITERIONS OF THERAPEUTIC GARDEN FOR CHILDREN

Result from previous researches show that healthy children and hospitalized children have different needs for a hospital garden. Healthy children are mainly anxious about the functional aspect of the environment and the opportunities for the active use of space such as whether a tree affords climbing, a wall can be jumped over, an object can be thrown, digging in sand and moving rocks (Gibson, 1979; van Andel, 1990). Through the research data from behavioral mapping, Whitehouse (2001) also discovered that the younger the persons the more likely they were to be involved in active or explorative play: 1) Young children (ages two to three) normally mentioned the water, a favourite object (e.g., the dinosaur), or their favorite things to smell; 2) Four- to five-year-olds mentioned their wishes to climb, run, and jump, or talked about the animal representations (e.g., tiles, artwork) they could find and name and; 3) Six to ten year olds were most likely to request more 'things to do', apparent to run out of ideas for creative play and want more structured or dedicated play areas. Therefore, Sherman (2005) suggested to design and provide highly interactive activities with both natural and structural elements for the youngsters to use and play them actively in the garden. Besides that, an observation has been carried out by van Andel (1990) to see whether the children might also use the outdoors for comfort or emotional healing. The study has found out that the children also wanted safe, enclosed, and hidden places for them to hide from others. These kinds of setting would have offered the elements of refuge that may give comfort and emotional healing to the children besides normally just providing them with outdoor play, environmental quality, opportunity for 'play leadership' and outdoor-indoor links in children's garden (Moore, 1999; Kirkby, 1989).

In contrast, the hospitalized children had different needs and perspectives on what is essential for them in a garden because they were less mobile, energetic, and healthy than the population from the garden. Through the observations and interviews that have been carried out by Whitehouse (2001), she discovered that young children who have been hospitalized for a long time, or those with physical or developmental disabilities were responsive to and appreciate of the garden or other hospital outdoor spaces. The hospital environments that are typically complex and unfamiliar would likely result in negative health outcomes such as physical pain and emotional distress to the children who have been continually exposed to the environments (Varni and Katz, 1997; Varni et al., 1996; Kiecolt-Glaser et al., 1998; Kaplan and Kaplan, 1983). In such situations, Kaplan and Kaplan (1983) suggested that exposure to a less complex natural setting would be experienced as relaxing because of the increased familiarity and lower information processing load such as to get away from the hospital and be in a different place, and a quiet garden where there were colors and flowers, animals and waterfalls. Whitehouse (2001) also proposed children's garden for the younger patients to have child-scale places and features such as artistic renderings of animals which can help them feel secure and in making their experiences more joyful moment at the hospital. While for the adolescents, they seek for privacy as they may have been self-conscious about their appearance. So, the elements of refuge need to be included in the garden to provide places where hospitalized children could look out and have privacy (Appleton, 1975; Balling and Falk, 1982; Kirkby, 1989). Despite differences in needs for a hospital garden between healthy children and hospitalized children, there were still certain elements that were favored together by them. The elements were stated in order of most to least: (1) the fountain with running water they could play in; (2) novel features such as the dinosaur, windmill, shadow wall, and animal tiles; (3) the flowers and trees; (4) being outside; and (5) the bright colors (Whitehouse, 2001).

NEEDED ELEMENTS AND CRITERIONS OF THERAPEUTIC GARDEN FOR STAFF

It has been known for decades that staff in the healthcare or hospitals often involved overload from work demands, lack of control or authority over decisions, and stress from rotating shifts (Ulrich, 1991). In such circumstances, staff commented on the need for the elements of privacy or refuge in the

garden such as a planted area that screened of a place in the garden or nice planted area with a climbing rose bush or jasmine, green and pleasant. They need a space which is separated from the patients and visitors to relax and restore during their rest time. Therefore, there were lots of evidence show that the hospital garden may increase staff satisfaction with the workplace and help hospital administrators in hiring and retaining qualified personnel (Whitehouse et al, 2001; Sadler, 2001; Cooper-Marcus and Barnes, 1995, 1999).

NEEDED ELEMENTS AND CRITERIONS OF THERAPEUTIC GARDEN FOR OLDER ADULTS

Depression is a common problem among older adults and mostly caused by social isolation occurring through the loss of friends, relatives, and loved ones, and also through exhaustion resulting from chronic disease (Skultety and Zeiss, 2006; Steffens et al, 2006). Many older adults are unable to resolve their depression symptoms as they prefer to resolve them through treatment for somatic symptoms which never addressed the underlying problem of depression (McCaffrey, 2007). Relaxation techniques, distraction therapies, exercise and behavioral modification have been proven to be effective in reducing depression among older adults (Haboush et al, 2006; Ost and Breitholtz, 2000; Thachil et al, 2006; Barbour and Blumenthal, 2005). Therefore, gardens or green spaces in the living environment have been discovered to have a positive relationship with physical, mental health and longevity such as effective in assisting persons to relax, to be distracted from negative stimuli, and to generate positive thoughts, thereby improving mood (Groenewegen et al, 2006). According to Bhatti and Church (2000), the older adults emphasized the importance of having some private space such as garden with natural setting elements that allow them to enjoy the peace and tranquility of nature. The significant of the garden is not only based on active engagement such as gardening but also the passive engagement that may include simply sitting, looking, contemplating, or walking in the garden. Many older adults are keen and interested in gardening but the declining in physical fitness prohibits them to undertake the heavier tasks while doing the gardening activity. In such situation, the development of a peer group among older adults has been one of the main elements of the allotment gardening activity. Gardening communally offered an opportunity to bring together a peer group that enabled each individual within the group to make the most of his or her skills and abilities to the benefit of the group as a whole, share knowledge and enhance social interaction among them (Milligan et al, 2004).

SUMMARY OF THE ELEMENTS OF THERAPEUTIC GARDEN

Table 1, below summarizes the elements of therapeutic garden for different age groups and healthcare staff from previous studies by Ulrich, 1977, Balling and Falk, 1982, Marcus-Cooper, 1995, Whitehouse, 2001, Sadler, 2001, Barnes, 1995 Milligan et al, 2004.

Table 1: Summary of the elements of therapeutic garden for different age groups

	Children	Adult	Older Adult	Healthcare Staff
Sound of running water	/	/	-	-
Bright colors	/	/	-	-
Outdoor/outside	/	/	/	-
Flowers and greenery/natural elements/tranquility with nature	/	/	/	/
Artwork	/	/	-	-
Sense of enclosure/save & sound	/	/	-	-

Opportunity for multisensory stimulation	/	/	-	-
Privacy/refuge	/	-	/	/
Passive activity (sitting, looking, contemplating)	-	/	/	-
Active engagement (interactive activity, play area)	/	-	-	-
Peer group activity	-	-	/	-

CONCLUSION

Therapeutic garden is generally built up for inhabitants of the healthcare facilities but it may also use and value by other users such as visitors (adults and children) and staff. The identification of the needed elements and criterions is seen as important factors in enabling future therapeutic garden design to be benefit to human health and increase the quality of life in cities. To do that, the designer needs to have knowledge about the group of people the garden are intended for and aware about their needed elements and criterions. From the review, we found that the most important elements and criterions needed by adult users in the garden are the elements that can allow people to interact both with the environment and themselves. Healthy children and hospitalized children have different needs for a hospital garden as the healthy children seek more on the elements of the garden that can provide them the opportunities for the active use of space. However, both of healthy children and hospitalized children seek the elements of refuge in the garden for comfort, emotional healing and privacy. Therefore, child-scale places have been proposed for the younger patient to help them feel secure and enjoy their treatment at the hospital. As for the staff, they demanded on the need for elements of privacy in the garden to help them restore and relax. While for the older adults, garden with natural setting elements and communal activity were seen to be useful and helpful for them.

REFERENCES

- Appleton, J. (1975). *The Experience of Landscape*. NewYork, John Wiley.
- Balling, J. D. & Falk, J. H. (1982). *Development of Visual Preference for Natural Environments. Environment and Behavior*.
- Barbour K, Blumenthal J. (2005). *Exercise Training and Depression in Older Adults. Neurobiol Aging*.
- Bhatti, M., & Church, A. (2000). 'I Never Promised You aRose Garden':Gender, Leisure and Home-making in Late Modernity.
- Cooper-Marcus, C. & Barnes, M. (1995). *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*. Martinez, CA: The Center for Health Design.
- Cooper-Marcus, C. & Barnes, M. (1999). *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York: John Wiley & Sons.
- Cooper-Marcus, C. (1995). *Places People Take their problems*.In M. Francis, P. Lindsey & J. S. Rice (Eds), *The Healing Dimensions of People-plant Relations: Proceedings of a Research Symposium*. Davis, CA: University of California, Davis Center for Design Research.
- Douglass, M., TrungQuang Le, Cameron Kawika Lowry, HaoThien Nguyen, Anh Nguyen Pham, Nghi Dong Thai, &HernaniYulinawati. (2004). *The Livability of Mega-urban Regions in Southeast Asia - Bangkok, Ho Chi Minh City, Jakarta and Manila Compared*. International Conference on The Growth Dynamics of Mega-Urban Regions in East and Southeast Asia, 24 - 25 June 2004,

Singapore.

- Epstein, M. (2006). Hospital gardens help patients heal, *Healthcare Design & Construction*, Special Section
- Gibson, E. J. (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Groenewegen W, van den Berg A, Vries S, Verheij R. (2006). Vitamin G: Effects of Green Space on Health, Well-being, and Social Safety. *Br J Public Health*.
- Haboush A, Floyd M, Caron J, LaSota M, Alvarez K. (2006). Ballroom Dance Lessons for Geriatric Depression: An Exploratory Study. *Arts Psychother*.
- Hartig T, Cooper Marcus C. (2006). Essay Healing Gardens—Places for Nature in Health Care. *Lancet*. Vol. 368. Pp.536-537.
- Kaplan, R. & Kaplan, S. (1983). *Cognition and Environment: Functioning in an Uncertain World*. New York, Praeger Publishers.
- Kaplan, R., Kaplan, S. (1989). *The Experience of Nature: A Psychological Perspective*. Cambridge University Press, Cambridge.
- Kaplan, S. (1995). The Restorative Benefits of Nature: Toward an Integrative Framework. *Journal of Environmental Psychology*.
- Kiecolt-Glaser, J. K., Page, G. G., Marucha, P. T., MacCallum, R. C. & Glaser, R. (1998). Psychological Influences on Surgical Recovery: Perspectives from Psychoneuroimmunology. *American Psychologist*.
- Kirkby, M. (1989). Nature As a Refuge in Children's Environments. *Children's Environments Quarterly*.
- Malcolm, M. (1992). Asclepius and the Muses: Arts in the Hospital Environment. *Int. J. Arts Med*.
- McCaffrey, R. (2007). The Effect of Healing Gardens and Art Therapy on Older Adults with Mild to Moderate Depression.
- Milligan C, Gattrell A, Bingley A. (2004). 'Cultivating Health': Therapeutic landscapes and Older People in Northern England.
- Moore, R. C. (1999). Healing Gardens for Children. In C. Cooper-Marcus & M. Barnes (Eds), *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York: John Wiley & Sons.
- Olds, A. R. (1989). Nature as Healer. *Children's Environments Quarterly*.
- Ost LG, Breitholtz E. (2000). Applied Relaxation vs. Cognitive Therapy in the Treatment of Generalized Anxiety Disorder. *Behav Res Ther*.
- Sadler, B. (2001). Design to Compete in Managed Healthcare. *Facilities Design & Management*.
- Sherman SA, Varni JW, Ulrich RS, Malcarne VL. (2005). Post-occupancy Evaluation of Healing Gardens in a Pediatric Cancer Center. *Landsc Urban Plan*.
- Skultety K, Zeiss A. (2006). The Treatment of Depression in Older Adults in the Primary Care Setting: An Evidence-based Review. *Health Psychol*.
- Steffens DC, Otey E, Alexopoulos GS, et al. (2006). Perspectives on Depression, Mild Cognitive Impairment, and Cognitive Decline. *Arch Gen Psychiatry*.
- Thachil A, Mohan R, Bhugra D. (2006). The Evidence Base of Complementary and Alternative Therapies in Depression. *J Affect Disord*.
- Timmer, V. & Seymoar, N.K. (2004). *The Livable City*. World Urban Forum 2006. Vancouver. www.icsc.ca.
- Ulrich, R. S. (1977). Visual Landscape Preference: A Model and Application. *Man-Environment Systems*.
- Ulrich, R. S. (1991). Effects of Health Facility Interior Design on Wellness: Theory and Recent Scientific

- Research. *Journal of Health Care Design*. [Reprinted in: Marberry, S.O. (Ed.) (1995). *Innovations in Healthcare Design*. New York: Van Nostrand Reinhold.]
- Ulrich, R.S. (1999). Effects on Garden Outcomes: Theory and Research. In: Cooper Marcus, C., Barnes, M. (Eds.), *Healing Gardens. Therapeutic Benefits and Design Recommendations*. Wiley, New York.
- Ulrich, R.S., Simons, R.F., Losito, B.D., Fiorito, E., Miles, M.A., Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology* 11.
- vanAndel, J. (1990). Places Children Like, Dislike, and Fear. *Children's Environments Quarterly*.
- Varni, J. W., Rapof, M. A., Waldron, S.A., Gragg, R. A., Bernstein, B. H. & Lindsley, C. B. (1996). Effects of Perceived Stress on Pediatric Chronic Pain. *Journal of Behavioral Medicine*.
- Varni, J.W. & Katz, E.R. (1997). Stress, social support, and negative affectivity in children with newly diagnosed cancer: A prospective transactional analysis. *Psycho-Oncology*, 6, 267-278.
- Whitehouse, S., Varni, J. W., Seid, M., Cooper-Marcus, C., Ensberg, M. J., Jacobs, J. J. and R. S. Mehlenbeck (2001). Evaluating a Children's Hospital Garden Environment: Utilization and Consumer Satisfaction. *Journal of Environmental Psychology*.

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LIVEABLE CITIES ENHANCE OPPORTUNITIES Accessibility Design for All.

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ABSTRACT

City is one of the factors that contribute to economic growth in a country. Apart from being a center area for commercial activities, industries, and trades, city also is known as an important place for people to live since it is able to provide a variety of opportunities and choices to the people. The increasing rate of urbanization and growing of the cities led to the need of creating city that livable for people to live. This situation ensures that the cities are able to support the needs and requirements of each resident in every aspect. Livable city also gives the opportunity to people to show the maximum self-potential and contribute to national growth. Accessibility is one of the driving force elements for every community to achieve the available opportunities and options. Thus, each of the proposed development or to be implemented must apply the sustainable development design elements to ensure that every opportunity and need is fulfilled. Application of universal design elements in every design of built environment development is seen to be one of the methods used to increase accessibility, especially for People with Disabilities (PwDs). Hence, this research aims to identify the extent of the implementation of universal design in the city development in Malaysia. The implementation phase will be measured or made by comparing selected cities in other countries with the cities in Malaysia through the level of implementation or application of universal design.

Key Words: *Urbanization, Accessibility, People with Disabilities (PWDs), Universal Design.*

INTRODUCTION

Having good accessibility from one place to another becomes an important social element in daily life. Providing good accessibility design help People with Disabilities (PwDs) to participate in social living. According to United Nation (2007), *“Accessibility is about giving equal access to everyone and without being able to access the facilities and services, disability people will never be fully included”*. PwDs are unique, required special attention and have a limitation in moving around or make use of built environment compared to a normal people. Added with inefficiency of accessibility, PwDs may face more difficulties and challenges toward opportunities promoted for their quality of life in cities.

Furthermore, previous disability studies found out that inaccessible built environment refers to external and internal environment as factors that contribute to the exclusion of PwDs from participating in daily activity (Wiman and Sandhu, 2004). Hence, the situation has led toward inconvenienced and lack of opportunities among PwDs such as employment, education, information, health and others that finally will give effect to their quality of life. Therefore, this study was conducted to identify the implementation level of universal design in current cities development in Malaysia in order to promote PwDs accessibility. The implementation phase will be measured or made in comparison with cities in

other countries that have been recognized as livable cities in universal design.

LITERATURE REVIEW

People with Disabilities (PwDs)

According to the population statistics by United Nations (2013), it is estimated that out of 10 percent of the world population are disabilities people. There are 28 million populations in Malaysia by 2010 reported by Department of Statistic (2010). Hence, the number of PwDs in Malaysia will be presented about 2.8 million of people. However, the figure is expected to keep increasing over the years due to people living longer today. In addition, Department of Social (2006) added that increasing traffic and industrial accidents have contributed to the number of PwDs in Malaysia. The increase of population scenario among PwDs has created demand in providing facilities and access for building and surrounding environment (Sanmargaraja and Seow Ta Wee, 2012). Therefore, PwDs will be able to participate in social living and enjoy their live.

It is essential to understand who are the disabled. Scherrer (2001) stated that a wheelchair user, a blind person or an elderly are not disabled in an accessible environment, even a normal people can be disabled if accessibility is not provided. They are disabled because of the barriers in architecture hinder PwDs from getting in and out of the buildings and get used of surrounding environment. Building been designed did not taken count the needs of PwDs cause difficulties while using the facilities provided. Consequently, the situation may cause vulnerable stress, low self-esteem and discomfort to the PwDs while they are in the public (O'Hara, 2004). A child, a person with a broken leg, elderly, pregnant women, a parent with a pram, delivery man with heavy loads and others are all disabled in one way or another.

Previous studies revealed that a few definitions of disability are made as following:-

- Based on the International Classification of Impairments, Disabilities and Handicaps (ICIDH, 1980) the definition of disability are made by interpreted as *'any restriction or inability (resulting from an impairment) to perform an activity in the manner or within the range considered normal for a human being.'*
- Code of Accessibility in the Built Environment by Harisson (2007) who defines the disabled as person who has a consequence of physical disability or impairment.
- Malaysian Person with Disabled Act (2008) stated disabled people as *'a person with physical, mental and intellectual disabilities that hindered them from fully participating in a normal way in the community way of life.'*
- Meanwhile, World health Organization (2010) defines disabled people are whom that may be poor in physical, cognitive, mental, sensory, emotional and development or some combination of these.

Chapireau and Colvez (1998) suggested that both the social and medical model of disability should be acknowledged in explaining the disability. By side of medical has focus more on the physical disorders of PwD while social shown an exclusion of PwD created by barriers in built environment. Impairment created limitation and prevents people from getting involved in daily activity. Thus, built environment should be design with barrier-free to encourage PwDs to access and participate with the social and economic mainstreams in order to enhance their quality of life. The Malaysia Department of

Social Welfare recognizes that there are 7 types of disabilities. PwD has been categorized based on types of impairment as described in Table 1.

Table 1: Categories of Disabled People.

Categories	Description
Hearing Disability	Individuals who are unable to hear clearly without hearing aids or unable to hear even with hearing aids. There are four levels of hearing disability categorized as below: Mild - (20 - < 30 dB) (for adults) Moderate - (30 - < 60 dB) Severe - (60 - < 90 dB) Profound - (> 90 dB)
Visual Disability	Individuals who are visually impaired or have low vision in either one eye or both eyes even with visual aids such as spectacles or contact lenses. There are two categories of visual disabilities as below: Blind Better eyesight but vision less than 3/60 even with vision aids or visual field is less than 10 degrees from fixation; Low Vision/Partially Sighted Eye-sight with vision is poorer than 6/18 but equal or better than 3/60 with visual aids or visual field is less than 20 degrees from fixation.
Physical Disability	An individual who is suffering from inability of the body to function normally either caused by bodily defect or injury. Disabilities that fall under this category are stunted, crippled hands or legs or both, maimed thumb, paralysis, spine bifida, muscular dystrophy and cerebral palsy. For impairment which does not affect functions such as handicapped one finger, has six fingers or more and without or imperfect earpiece is not categorized as physical disabilities.
Learning Disorder	Individuals whose intelligence is unbalanced with his or her biological age. People with down syndrome, inert, intellectual disabilities, autism, Attention Deficit Hyperactive Disorder (ADHD), specific learning disabilities (dyslexia, dyscalculia, and dysgraphia) and global development delay fall under this category.
Speech Disorder	An Individual who is able to hear but with speech problem.
Mental Disorder	An Individual who has a severe/chronic mental disorder and undergone treatment or was given diagnosis by psychiatrist for at least 2 years. As a result of the illness, they are still unable to function either partially or fully in relation to himself or herself or with the community even after undergoing psychiatric treatment. Schizophrenia, mood disorder and chronic Organic Mental Disorder are among the mental illness category.
Various Disabilities	Individual who has more than one type of disability and not suitable to be classified under any of the five (5) existing categories. For example, an individual who has 2 types of disabilities such as vision and hearing disabilities will be registered under the category of various disabilities.

(Sources: Malaysia Department of Social Welfare, 2013)

The Concept of Universal Design

Application of universal design elements in every design of built environment development is seen to be one of the methods used to increase accessibility, especially for People with Disabilities (PWDs). Acknowledgment of people toward universal design has developed since last decades. Malaysia is one of the developing countries has shown many improvement in term of providing accessibility via universal design in built environment. However, the understanding of universal design concept is still at lower level. By time past, there are lot of number of existing public building especially government building has been renovated to comply with the universal design standard. Nonetheless only a few buildings were approved by the standards (Chen et al, 2007). In another situation, some of the building that have done modifications are still not been fixed correctly.

The term of Universal Design was founded in the United State of America by Ron Mace that describes as the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. The concept of designing product and the built environment should be aesthetic and usable by all people, regardless of their size, age, physical ability or disability and status. Since Malaysia signed the 'Proclamation on the Full Participation and Equality of People with Disabilities in the Asia Pacific Region' in 1994, the country has been actively providing accessibility in the built environment by promoting the universal design concept. The Persons with Disabilities Act, Malaysia (2008) defines Universal Design as the design of products, environments, programs and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design and shall include assistive devices for particular groups of persons with disabilities where this is needed."

The universal design accompanied by 7 principles in order to guide a wide range of design disciplines and becomes very useful to apply in cases such as to evaluate existing designs and guide the design process. On another hand, it is also enable to educate both designers and clients in creating more usable products and user-friendly built environments. The principles of universal design are described in Table 2:-

Table 2: The 7 principles of universal design

Principle	Description	Examples
<p>Equitable use. The design is useful and marketable to people with diverse abilities.</p>	<ul style="list-style-type: none"> ▪ Provide the same means of use for all users: identical whenever possible; equivalent when not. ▪ Avoid segregating or stigmatizing any users. ▪ Provisions for privacy, security, and safety should be equally available to all users. ▪ Make the design appealing to all users. 	<p>Entrance to building. Every building should have a doorway at the entrance to allow visitors especially wheelchair user to enter into the building. Every visitor to the building should be able to use the same entrance. Entrances and exits used by the sight impaired should be easy for them to be identified by guiding blocks.</p>
<p>Flexibility in use. The design accommodates a wide range of individual preferences and abilities.</p>	<ul style="list-style-type: none"> ▪ Provide choice in methods of use. ▪ Accommodate right or left-handed access and use. ▪ Facilitate the user's accuracy and precision. ▪ Provide adaptability to the user's pace. 	<ul style="list-style-type: none"> ▪ The Counters desk should be able to access by visitor either seated (wheelchair user) or standing. ▪ Hand-held shower controls can be reached from the toilet, allowing the user to bathe while seated. ▪ Scissors designed for both right and left-handed users. ▪ An automated teller machine (ATM) that has visual, tactile, and audible feedback to access various types of users.
<p>Simple and intuitive use. Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or education level.</p>	<ul style="list-style-type: none"> ▪ Eliminate unnecessary complexity. ▪ Be consistent with user expectations and intuition. ▪ Accommodate a wide range of literacy and language skills. ▪ Arrange information consistent with its importance. ▪ Provide effective prompting and feedback during and after task completion. 	<ul style="list-style-type: none"> ▪ A manual instruction for product offered a series of illustration rather than text with different languages. ▪ Icons applied in designed remote control help to minimize the need for reading.
<p>Perceptible information. The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.</p>	<ul style="list-style-type: none"> ▪ Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information. ▪ Provide adequate contrast between essential information and its surroundings. ▪ Maximize legibility of essential information. ▪ Differentiate elements in ways that can be described (example: make it easy to give instructions or directions). ▪ Provide compatibility with a variety of techniques or devices used by people with sensory limitations. 	<ul style="list-style-type: none"> ▪ Information available in different formats visual, audio and braille help visitors to proceed to the next stage. ▪ Touch n' go fare machine provides push-button for selecting instructions in audio format. ▪ Contrasts in color and brightness for signage make easy for visitors to find direction.
<p>Tolerance for error. The design minimizes hazards and the adverse consequences of accidental or unintended actions.</p>	<ul style="list-style-type: none"> ▪ Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded. ▪ Provide warnings of hazards and errors. ▪ Provide fail safe features. ▪ Discourage unconscious action in tasks that require vigilance. 	<ul style="list-style-type: none"> ▪ Curb ramp helped to reduce risk of slipping off from the ramp especially for wheelchair user. ▪ Label on escalator advises parents of potential hazards to children. ▪ "UNDO" option allows computer user to correct their mistakes.
<p>Low physical effort. The design can be used efficiently and comfortably and with a minimum of fatigue.</p>	<ul style="list-style-type: none"> ▪ Allow user to maintain a neutral body position. ▪ Use reasonable operating forces. ▪ Minimize repetitive actions. ▪ Minimize sustained physical effort. 	<ul style="list-style-type: none"> ▪ Door lever can be operated with closed fist or elbow compare to door knobs. ▪ Water flow control in water park is easy for children to operate. ▪ 1/4-turn cap on bottle minimizes repeated twisting. ▪ Pedestrian malls provided bench to rest

<p>Size and Space for approach and use. Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility</p>	<ul style="list-style-type: none"> ▪ Provide a clear line of sight to important elements for any seated or standing user. ▪ Make reach to all components comfortable for any seated or standing user. ▪ Accommodate variations in hand and grip size. <p>Provide adequate space for the use of assistive devices or personal assistance.</p>	<p>allow visitors to take a rest.</p> <ul style="list-style-type: none"> ▪ Lowered counter desk provides line of sight for various types of visitors (tall, short, wheelchair and others). ▪ Under-counter on desk provides access from a seated position. ▪ Open-loop door accommodates to all sizes of hands. ▪ Vehicle door with wide-opening provides for close approach to seat with wheelchair or other user.
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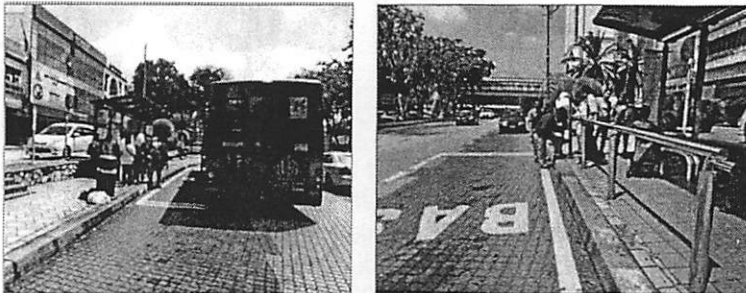

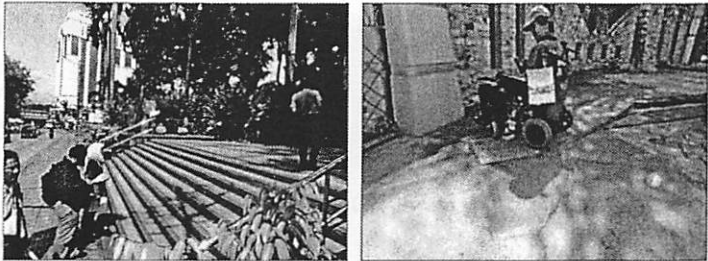
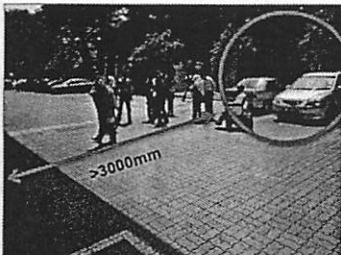
Accessibility Design in Malaysia.


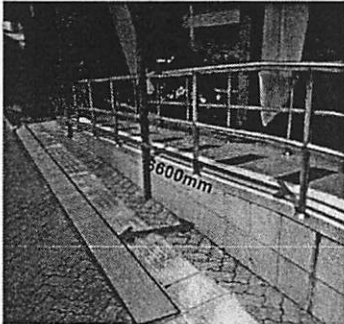
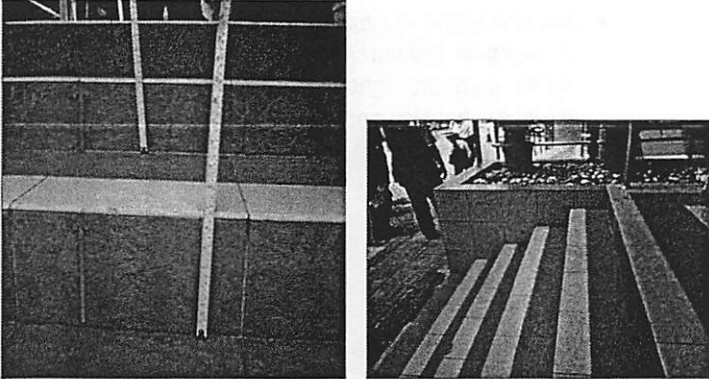
Various studies have been made by academia, researchers and scholars regarding implementation of universal design in current built environment in Malaysia especially for public buildings. These studies are as follow;

1. According to Jamaluddin and Abdul Kadir (2011) in journal of Accessibility in Buildings of Tourist Attraction: A case studies comparison. The study assessed the accessibility of 3 public buildings of tourist attraction in Malaysia which is Berjaya Times Square, Central Market Kuala Lumpur and Museum of History and Ethnography Malacca (Stadthuys). They found out that from the 15 facilities only door and doorways are facility with the best compliance to Malaysian Standard code.
2. Accessibility for Disabled in Public Transportation Terminal by Soltani et al. (2011). The study has been conducted at KL Central and Klang Central Station. They found that female and elderly were the highest users of public transport at both terminals. In term of safety, the researcher found that walking to and from the terminal, boarding and alight from chosen public transport is the most critical part to female and elderly. Hence the facilities with friendly design should be provided to increase safety, better usage and accessible.
3. Applicability of Malaysian Standards and Universal Design in Public Building in Putrajaya by Abdul Kadir and Jamaluddin (2011). The study assessed the accessibility of 5 buildings in Putrajaya according to regularity of public visiting. Through the study, they found that out of 15 facilities, guiding block, information counter and ablution area show a major flaws in terms of accessibility. Guiding block is incorrectly installed and may risk the PwDs especially vision impairment. The information counter does not meet the MS code. It is too high for wheelchair user and short people to reach. The counter also does not provide space for wheelchair to roll under. Finally the ablution area where there are levels changes in front of the water faucets and prevents PwD such as wheelchair user, elderly and crutches user to use conveniently.

Through the study, we also have carried an access audit within 2 buildings and 3 precincts in Petaling Jaya City Council area. There are Dewan Sivik, Headquarters of Petaling Jaya City Council, from bus stop to the headquarters of Petaling Jaya City Council, from parking lots of Petaling Jaya City Council to the shop lots and lastly, from bus stop to the tower of Petaling Jaya City Council. Finding of the access audit as show in Table 3:

Table 3: Finding of the access audit in Petaling Jaya City Council

FINDINGS	
<p>Bus stop at Yong Shook Lin Street</p> <ul style="list-style-type: none"> ▪ Do not have signage to assist PwDs at the bus stop. ▪ The bus stop did not provide a step ramp for wheelchair user to get into the bus stop. ▪ Placement of the bus stop at the diversion of road has hindered the bus to stop near to bus stop. ▪ There are no direct access to the bus and been blocked by railing. ▪ Diameter of railing is more than 60mm. ▪ Not available space for wheelchair user not provided for the wheelchair. ▪ The seats are not even suitable for the PwD who wear crutches or artificial leg till waist. 	 <p style="text-align: center;">Bus stop without step ramp to access</p> <p style="text-align: center;">Railing at the bus stop</p>
<p>Pedestrian walkway of Jalan Yong Shook Lin</p> <ul style="list-style-type: none"> ▪ Two lines of guiding block are not economical. ▪ Distance between guiding blocks and seat are less than 150mm. ▪ The height of the signs along the pedestrian walkway is not high enough. ▪ Some signs have been installed at the wrong direction. 	 <p style="text-align: center;">Pedestrian walkway and guiding blocks</p> <p style="text-align: center;">Signage</p>
<p>Pedestrian walkway at the park of Petaling Jaya City Council</p> <ul style="list-style-type: none"> ▪ No additional railing provided at the stair that has width more than 3000mm. ▪ No contrast colour of steps. ▪ The risers of the step are not uniform in height. ▪ No curb at the side of the ramp. ▪ The gradient of the step ramp does not follow MS 1331:2003. ▪ There is a main hole at the beginning of the ramp. ▪ Poor landscape maintenance will cause problem to visually impaired PwDs. 	 <p style="text-align: center;">The Staircase to the Petaling Jaya City Council's Park</p> <p style="text-align: center;">Step ramp</p>
<p>Parking area at the Headquarter of Petaling Jaya City Council</p> <ul style="list-style-type: none"> ▪ The distance of parking lots for PwD is more than 3000mm to the main entrance. ▪ The design of the existing parking does not follow the prescribed standard for PwD. ▪ The placement of the buffer area for wheelchair user at the left side of parking lot 	 <p style="text-align: center;">>3000mm</p>

<p>is not suitable.</p>	<p>Distance of the Parking to the Main Entrance</p> 
<p>Ramp and handrail at the main entrance of the Headquarter of Petaling Jaya City Council</p> <ul style="list-style-type: none"> ▪ No curb at the both side of ramp ▪ No resting area provided as the length of the ramp is more than 6000mm. ▪ Two lines of guiding blocks which are not economical ▪ The distance between guiding blocks and ramp are less than 150mm. 	 <p>The Length of the Ramp and Guiding Blocks</p>
<p>Staircase at the main entrance of MBPJ's main building.</p> <ul style="list-style-type: none"> ▪ The height of the risers is not uniform. ▪ No guiding blocks provided to warn PwD before going up or down the stair. ▪ No railings provided at both side of the stair which has the width more than 3000mm. 	 <p>Different height of risers Staircase without railing</p>

International Practice of Universal Design

Adelaide City Council believes that PwD should have equitable access to the built environment, facilities and services provided. Hence to improving accessibility for PwD, a few elements of universal design have been provided by the council as follows (figure 1)

- **Safe lane crossings:** The guiding block with circular bumps is installed on both sides of the pedestrian to warn PwD especially the blind regarding level change, a step ramp, the edge of stairs or to indicate you are entering traffic.
- **Traffic signals for pedestrians:** A street with traffic lights, the button of traffic signal is installed with directional arrow to help the PwD and others pedestrians to cross the street. The symbol of walking green man and sound is to indicate when it safe to cross. The arrow also will vibrate to assist the PwD with hearing impairment.

- **Braille signage:** The city council has installed braille signage with large size of letters to access PwDs and pedestrians at a few street intersections such as Currie Street, Grenfell Street and King William Street.
- **Teletypewriter phones:** The phones are provided for people who able to typing instead of using voice to communicate especially PwD with hearing impairment.



Figure 1: Universal design elements in Adelaide to assist PwD move around.

1. Universal Design at Haneda Airport, Japan

As a public transport organization, Japan Airlines enhance their services by providing a safe and comfortable journey to the customers with universal design as follows (figure 2)

- **Ease to understand displays or signage**
By applying a symbol and color guides at the terminal entrance makes it easier to customers to find their way. The large-size of character or letters installed on signage is convenient to all people. There is also a symbol on the signage that can be easy understood at a glance. In order to enhance user friendly by applying color scheme for each signage to help people to identify and remember.

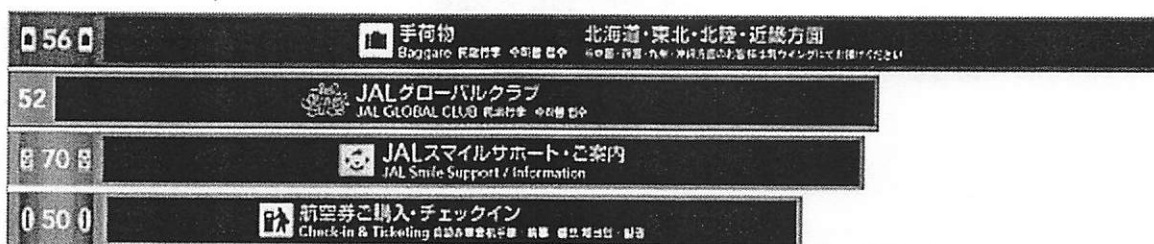


Figure 2: Symbol, large-size of letters and color scheme on signage

- **Support counters**

In order to assist customers to process their boarding document or getting the information, Japan Airlines has provided the support counters for all types of customers by utilizing lower counters and chairs. A universal symbol has been placed at selected counter to assist PwD with special.



Figure 3: Support counters to assist customers

- **Multi-function restroom with lounge buttons**

The restroom door or entrance has been installed with the pictogram or symbol. There are also a set of Nabco System switches installed to assist PwDs to open and close the door while using the restroom. The switches also help low vision or color blindness to identify the restroom by utilizes color schemes using blue LED and braille letters.

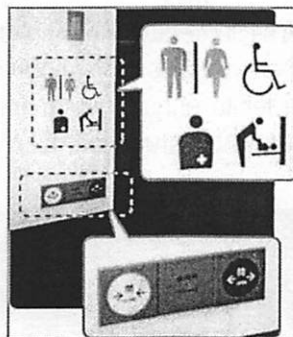


Figure 4: Symbol and Nabco System switches

2. Universal Design for Workplace in Fujitsu Building(Hirano et al (2004).

In order to enhance innovation and efficiency business operations, Fujitsu has implemented universal design to their working place. Fujitsu believes that by implementation of universal design will helps to improve the use of working place and it environment of elderly and PwDs. Regarding universal design in working place, the facilities are designed serve limited only to employees and visiting customers compared to public buildings as follows (figure 5):

- **Parking lot and passageways**

The secure parking lot and wider passageways are provided for PwDs especially for wheelchair users to move easily. To ensure comfort for wheelchair user, the passageways have been built wider than standard width required

- **Multipurpose restrooms**

The multipurpose restrooms are provided on each floor to ensure easy access PwDs to the facility. The design of restrooms regarding size and space is to comply with the standard requirement.

- **Reception desk**

There is concierge (information desk) provided to supported the conferences and daily work. It is not used for the reception however offers services such as to solve problems regarding office use, equipment maintenance, items supplied with the aim to improved employee-friendly in a workplace.



Figure 5: The passageway, multipurpose restrooms and concierge provided in Fujitsu building

CONCLUSION

In Malaysia, providing accessible built environment is still at moderate level since we have been actively providing accessibility in 1994 compared to other countries. The current situation show that the accessibilities such as ramp, railing, guiding block and others has been provide but the users especially PwD feel difficulties or discomfort while used it. Therefore, this will lead to hinder PwDs to get access to high quality of living and also to the opportunities.

Hence, to promote the livable city that contributes to give opportunities to PwDs, the built environment especially public buildings need to provide a more exclusive environment to cater the needs for all users. There are lots of improvements needed to be done in order to promote the friendliness environment for better usage and accessibility.

REFERENCES

- Chapireau, F. and Colvez, A. (1998). Social Disadvantage in the International Classification of Impairments, Disabilities, and Handicap. Journal of Social Science and Medicine, 47 (1), 59-66.
- Chen, R. K. et al. (2007). Rehabilitation Services and Education in Four Asian Countries: Thailand, South Korea, Singapore, and Malaysia. Journal of Rehabilitation Education, 21 (4), 231-240.
- Department of Social Welfare (2006). Statistics Profile 2006, Ministry of Women, Family and Community Development. English Heritage (undated). The History of Whitby Abbey [Online]. Retrieved on Jun 2013 from <http://www.englishheritage.org.uk/daysout/properties/whitby-abbey/history/>
- Department of Statistic Malaysia (2010). Population distribution and basic demographic characteristic report 2010 [Online]. Retrieved on Jun 2013 from <http://www.statistics.gov.my/portal/index.php?lang=en>
- Hirano et al. (2004). Universal design for workplace [Online]. Retrieved on Jun 2013 from <http://www.fujitsu.com/downloads/MAG/vol41-1/paper13.pdf>
- Jamaluddin.M and Abdul Kadir.S (2011). Accessibility in Buildings of Tourist Attraction: A case studies comparison. Journal of Social and Behavioral Science, 35 (2012) 97-104.
- Jamaluddin.M and Abdul Kadir.S (2011). Applicability of Malaysian Standards and Universal Design in Public Buildings in Putrajaya. Journal of Social and Behavioral Science, 36 (2012) 659-669.
- Laws of Malaysia, Act 658, People with Disabilities Act Malaysia (2008). Part IV, Promotion and Development of the Quality of Life and Wellbeing of Persons with Disabilities. Percetakan Nasional Berhad, Kuala Lumpur.
- Ministry of Women, Family and Community Development through the Department of Social Welfare [Online]. Retrieved on Jun 2013 from <http://www.spa.gov.my/PortalEng/PersonsWithDisabilities>
- Molly Follette Story M.S. (1998). Maximizing Usability: The Principles of Universal Design, Assistive Technology. Journal of RESNA, 10:1, 4-12.
- O'Hara, B. (2004). Twice Penalized: Employment discrimination against women with disabilities. Journal of Disability Policy Study, 15 (1), 27-34.
- Scherrer, V. (2001). Seminar of Design for all Notes, OFD Publication. Istanbul, CemOfset, pp. 38-42.
- Shalini a/p Sanmargaraja & Seow Ta Wee (2011). Kajian Penyediaan Fasilitas Orang Kurang Upaya di Institusi Kerajaan di Nusajaya, Johor Bahru [Online]. Retrieved on Jun 2013 from <http://eprints.uthm.edu.my>
- Soltani, S. H. K., Abbas, M. Y., & Awang, M. B. (2012). Disabled Children in Public Playgrounds: A Pilot Study. Journal of Social and Behavioral Sciences, 36(0), 670-676
- United Nation (2007). Accessibility; A guiding principle of the Convention.
- United Nations Enable, "Accessibility for the Disabled - A Design Manual for a Barrier Free Environment" [Online]. Retrieved on Jun 2013 from <http://www.un.org/esa/socdev/enable/designm/index.html>
- Wiman, R. & Sandhu, J. (2004) Integrating appropriate measures for people with disabilities in the infrastructure sector, Eschborn: GTZ.
- World Health Organization, ICDH-2 (1998) [Online]. Retrieved on May 2013 from <http://www.who.int/icidh/introduction.html>
- World Health Organization (2010), International Classification of Functioning, Disability and Health (ICF) [Online]. Retrieved on Jun 2013 from <http://www.who.int/classifications/icf/en/>

A NEW VISION OF MISURATA CITY, LIBYA: AN ECOLOGICALLY ADVANCED URBAN LANDSCAPE DESIGN

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ABSTRACT

Urban landscape becomes a model for contemporary urbanism especially in term of ecological condition. This helps the awareness of environment. Many projects embodied in landscape urbanism. Exploring urban design is important with emphasis on urban landscape and how it involves in the city structure in order to produce healthy community with a new vision of urban setting. The city of Misurata has been destroyed before and after revolution. The city became overcrowded, dirty and lack of infrastructure. Now it is the time to consider about the change into ecological sustainability. After revolution people of Libya are thinking about how to change the structure of the city. Also they are looking for what an appropriate way to improve the quality of life of the society in modern way. The city has to look what is needed to integrate with in urban landscape in master plan. How the ecological system can improve the life of the city center. This discussion is to make change in Misurata city and imbedded the nature and sustainability with education and to create within the dense fabric of the city parkland linked to time free and pedestrian cycle. Nature and sustainable development should involve in city fabric structure because it has proven to produce healthy society. It is the time to introduce these elements to the city Misurata,Libya with redevelopment the existing area with future vision of the city requirement.

Key words: Landscape, Ecology, Healthy, Sustainable, Vision

INTRODUCTION

For a long time, urban landscape has become a model for contemporary urbanism, especially in terms of ecological condition. This helps increasing the awareness of environment. Many projects are embodied in landscape urbanism. Only recently there has been a big project in Libya, the country of my origin, proposing Green belt around the city of Tripoli. There are other studies about landscape in redevelopment waterfront in many countries for water treatment, so there are different ways how landscape can be studied. "Urban landscape" according to Waldheim, as koolhass put it in 1998: "Architecture is no longer the primary element of urban order, increasingly urban order is given by a thin horizontal vegetal plane, and increasingly landscape is the primary element of urban order." From this quotation the researcher understood the idea of urban landscape and how it involves urban fabric. However the goal in this study is to integrate the idea of urban planning and design with architecture and landscape used. The research is going to try to find way how the researcher can connect these categories in contemporary urban city planning for the Misurata city.

PROBLEM STATEMENT

The study exploring urban design with emphasis on urban landscape and how it involves in the city structure in order to produce a healthy community with a new vision of urban setting. The city of Misurata has been destroyed before and after revolution in 2011. The city became overcrowded, dirty and lack of infrastructure. Now it is the time to consider the change into sustainable environment. After revolution, people of Libya are thinking about how to change the structure of the city. Also they are looking for an appropriate way to improve the society in a modern way. The city has to look what is needed to integrate with in urban landscape in master plan. How the ecological system can improve the life of the city center.

PHYSICAL AND THEORETICAL CONTEXT

The goal is to make change in Misurata city and imbedded the nature and sustainable with education and to create within the dense fabric of the city parkland linked to free pedestrian walking cycling. Nature and sustainable should involve in city fabric structure because it has proven to produce healthy society. It is the time to introduce these elements to the City of Misurata, Libya and redevelopment the existing area with future vision of the city requirement.

RESEARCH METHODOLOGY

Proposed research methods and data collection consists of interpretive history research on Misurata as the case study. General information on city design and urban planning/ design will be obtained through literature and site study. Many different methods have been conducted with this methodology; therefore, case studies will be looked at and analyzed to understand the pros and cons of their results. Thus, interpretive history research such as discussions and surveys will help get a better understanding of the design process and city structure demand. Finally, after all data is collected to help design of a new image of the city.

EXISTING KNOWLEDGE

The intent of this literature review is to look at what research has been done on the subject of whether the landscape as urbanism/mixed with architecture/how it applies with the city fabric. The researcher found couple of study about landscape as urbanism however there are not many information about how this can be imbedded with the city planning. According to Nancy and Ken, (2010) landscape architects can envision, plan and design urban environment that are diverse and healthy for not only humans, but also for the myriad of other species that share these places. There is one project found related to the study but they applied only landscape but not intersection architecture and urban landscape use. This project is located in Tripoli, Libya designed by Clement. There are many profession introduced this idea in landscape disciplines like Koolhaas, Jamse Corner and Clement. According to Charles (2006),

"Landscape urbanism offers an implicit critique of architecture and urban design inability to offer coherent, competent, and convincing explanation of contemporary urban conditions. However can be introduced as contemporary landscape urbanism practices recommend the use of infrastructure systems and the public landscape then engender as the very ordering mechanisms of the urban field itself, shaping and shifting the organization of urban settlement and its inevitable indeterminate economic, political and social futures."

He also explained the meaning behind landscape urbanism continuing space, albeit modulated by economic conditions related to urban shrinkage and growth. He notes;

Thinks that landscape urbanism continues to be of value because of its unique ability to reconcile contemporary economic systems with the underlying ecological conditions in which urbanism is situated.

There is a large amount of literature on ecological master planning and ecocities can be implemented and how it integrates with urban form to define the hierarchy and form of natural. According to Yeang, "this green infrastructure in the ecomasterplan becomes the dominant green framework within the site and across its landscape." Also he adds, "this green infrastructure must be an essential and integral component at all levels of urban planning (national regional and local)." These quotations are open page for my research and try to develop more and how it can be integrated in Misurata after revolution for future image. How it related to urban design process is based on Hamid who gives explanation of the element of urban design. He divided it as land use, building form and massing, circulation and parking, open space, pedestrian ways and activity support. I can understand the element and how it can be performed in landscape infrastructure directed masterplanning idea. According to Bullivant, "this chapter argues for the vital for ecologically advanced landscape design to be part of matserplanning, focusing on process and systems." In this book of masterplanning presented a large amount of idea how the vision of 21 century. The ecological design involves in urban fabric to create the city image for future sustainable requirement for long term. In different size and program are diversity and complexity of ecological approach. Adaptive ecological design is sustainable design which is based on resilience for long term demand. There was competition held in 2000 for downs view Park in Toronto. There were five finalist teams responded with adaptive design that were asking to solve the condition. Nine (2007) states;

"Ecological design is an emerging interdisciplinary field of study and practice... influence principally by ecology, the environment sciences, environment planning, architecture and landscape studies".

My research will look at these aspects; ecological is to connect the culture with nature in order to respond the environmental development. This study considers very relative to my goal, so I will integrate the idea of landscape with ecological design to respond the human creation. Based on Nine interpretation of Sim Van der Ryn and Stuart Cowan defined ecological design as a join that connects culture and nature. According to Kongjian Yu (2010) there is spatial strategy of urban development planning to apply in land and living system in order to identify an ecological infrastructure that will help to drive the urban development.

"Ecological infrastructure is defined as the structural landscape network composed of critical landscape elements and spatial patterns. Also has strategic significance in safeguarding the integrity and identity of the natural and cultural landscape, which in turn secure sustainable ecosystem services."

There are five ecological challenges for the contemporary city according to Stefano. I will explain it one by one and see how far I could apply in the future of Misurata city.

1- Sustainability and Democracy

To look at pollution, consumption of oxygen, and CO₂ production, we must understand that is not only large building to blame. There are other responsibility lies with small component which consume oil while producing carbon and grime. Architectures and builders are responsible for consuming less energy and are able to collect and produce more energy. In Europe, the United States, and Asian countries some understood the democratic environmental policy and understand the economic advantage. Those elements are not a new but it has to introduce to the city of Misurata to face the new generation of sustainable and democracy.

2- Agriculture and Ground Consumption

It is required to find a development model no longer connected to horizontal expansion which is not only affected the agriculture land but swept aside for the living space of animals and plants. This how we should consider our contemporary cities. This should be linked to the future of periurban agriculture. Cultivated terrain around and between cities can once more become a crucial resource for our urban economic if we are willing to defend it from extensive urbanization and give it a new and strong economic value and use. We have to treat the periurban agriculture space becoming active and livable spaces. This point should bring up in a new vision of master planning for Misurata city since the people already expert in agriculture field and in the history of the medina know by name of Palm tree but this tree almost disappear if they are not regrown for future uses.

3- Nature and control

There is a different relation between nature and city in urban fabric. We must think of accepting a relationship with nature on equal terms in city that has its own autonomy and is not unendingly influenced. We must foresee space for a nature that is close to us and yet is not controlled. In other way, we must begin to conceive the possibility of territories. This is how I am going to able to a new vision of Misurata masterplanning. Gilles Clement (2010) has proclaimed for years the need to acknowledge the diffusion of a third landscape in which he already applied in his design of master plan for Tripoli, Libya to implement green belt into the city fabric. We should introduce this route into the city and make green corridors and parks that are inaccessible to humans. Especially Misurata needs to apply this in order to reduce the heat environment.

4- Compact and discard

During the last decades there were a risk in Europe and United States that large portion of urban area built. This also effected in other country like Libya. There were not policies to control building area. It is low-density developments have begun to show growing. There is no longer possibility of creating public infrastructure, whether because the low density of population does not make it worthwhile or simply because the space no longer exists. The idea is to propose high-rise buildings laden with common green surface and space. It is not going to bring the park in city but it helps the image of the city center. Or the government has to replace some buildings which belong to the city council by adding City Park. This is only way for planners to reuse the place by changing the zoning of the area.

5- Desertification and subsidiarity

All I have mentioned above does not make sense if we do immediately activate policies to reduce the existing urban "desertification." There is lack of concern about the cause of this desertification. Urban desertification is not only an urban problem but a pervasive phenomenon that, if faced, could meet the needs of millions of families. In general the more essential to create urban policies that are able to trigger a creative recovery of our cities' territories. Cities must cease to grow by devouring nature and agricultural land and instead pay attention to the environment, regenerating and recovering the urban deserts that represent the real measure of today's political shortsightedness.

CONCLUSION

I hope to come up with a new vision of the city image to be better environmental design to fit the new generation of sustainability of the city. There are many studies going on to consider about the image of the city and how can be improved in term of healthy environment. This issue I am going to develop in my project how we can design healthy city. Before the idea of city design is to solve the connection with simple grid and separate park. But now the master planning of city has to be changed in way of ecological factor.

REFERENCES

- Boeri, S. (2010). five ecological challenges for the contemporary city. In m. Mostafavi, & G. doherty, *ecological urbanism* (p. 444). Boston: Lars Muller.
- Bullivant, L. (2012). Masterplanning futures. In L. Bullivant, *Landscape and social infrastructure-driven masterplanning* (p. 13). Routledge New York.
- Clement, G. (2009, 10 10). *Tripoli Greenbelt*. Retrieved February 11, 2013, from <http://cargocollective.com/tripoligreenbelt>
- Green, J. (2013, 02 20). *American Society of Landscape Architects*. Retrieved March 01, 2013, from american society of landscape architects: <http://dir.asla.org/2013/02/20/peter-walker-is-a-visionary-in-urban-development/>
- Koolhaas, R. (1998, March 5). IIT Student Center Competition Address. ILLinois Institute of Technology, College of Architecture, Chicago.
- Lister, N. M. (2007). Sustainable Large Parks: Ecological Design or Design Ecology? In J. Czerniak, & G. Hargreaves, *Large Parks* (p. 35). Princeton Architectural Press.
- Rottle, n., & Yocom, k. (2010). *Ecological design*. Switzerland.
- Shirvani, H. (1985). *The Urban Design Process*. New York: Van Ostrand Reinhold Company.
- Ven der Ryn, S., & Cowan, S. (1996). *Ecological Design*. Washington, DC: Island Press.
- Walheim, C. (2006). Landscape as Urbanism. In C. Walheim, *The landscape Urbanism reader* (p. 35). Princeton Architecture Press.
- Yeang, K. (2009). Ecomasterplanning and Ecocities. In K. Yeang, *Eco master planning* (p. 16). John Wiley and Sons.Ltd.
- Yu, K. (2010). The Big-foot revolution. In M. Mostafavi, & G. Doherty , *Ecological urbanism* (p. 282). Boston: Lars Muller.

TRADITIONAL BUILDING MATERIALS IN THE ARCHITECTURE OF THE OLD CITY OF IBB

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ABSTRACT

Yemeni traditional architecture is of a wide range of patterns in which a variety of building materials was used. This paper aims at identifying the traditional materials upon which the ancient architecture in the city of Ibb was built. As one of the oldest Yemeni cities, Ibb has building in which stone was used as the basic material. Other materials included wood, clay, plaster and lime. This study followed the analytical descriptive method to achieve its aims by using the theoretical scholarship available. Observation and other tools of studying the type of materials were used. It was found that the distinction and richness of Yemeni traditional architecture can be attributed to the geological and topographical reasons. The use of stone as the basic material was due to the environmental conditions and helped to maintain the survival of the structure of the architecture up to the present day. The study concluded that in addition to material stone, wood, clay, plaster and lime among many were the materials building of Ibb their uniqueness on other Yemeni cities.

Key Words: *building, material, traditional, construction, architecture, Ibb*

INTRODUCTION

Architecture of traditional countries adopted the surrounding environment for local materials to meet the needs of building different. Not only in the construction of shelter or housing, but also in public and religious buildings. Some of these countries seek to bring some material from areas farther from the surrounding environment, according to the quality of the building and the economic and Social situation of those countries.

In Yemen, the diverse architectural styles from traditional architecture as in Figure 1. This diversity is the result of different building materials are distinguished local environmental. The professionals relied on conventional local materials in construction in the production of the structuring elements of the traditional architecture, building using what is available in the environment to meet the characteristics and qualities of building construction. Traditional architecture become part of its natural environment forming a unique harmony (Hanshor, 2009, p85).

In traditional architecture in ancient Ibb, Artisan excelled in exploiting the possibilities of local construction materials and construction, and was able to formulate distinctive builders model using local building materials, this integration model where the two sides aesthetic with architectural construction.

Load-bearing walls and structural elements worked on the composition of architectural and structural systems at one time.

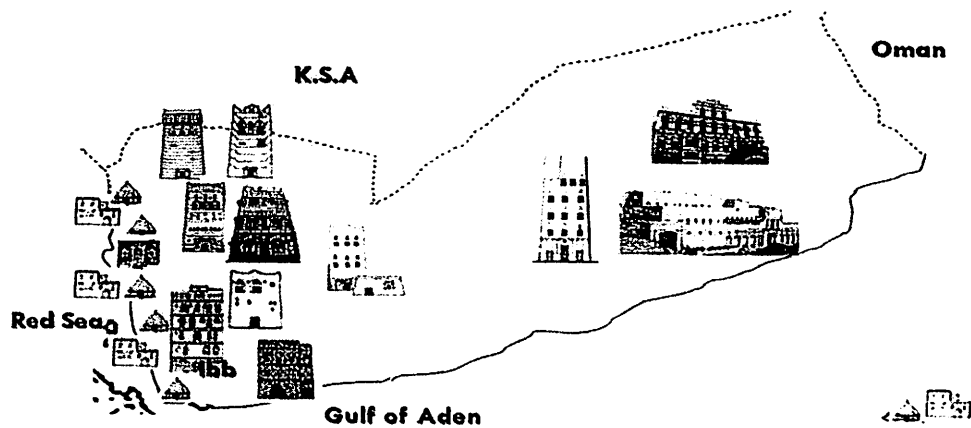


Figure 1

The Diverse Styles from Traditional Architecture in Yemen

Source: Abdo, 2007, p66.

Traditional architecture in Ibb characterized by retaining the legacy of humanist different from the rest of the Yemeni cities other, but she did not receive a share of interest and maintain as in the rest of the cities, in addition to the lack of studies and research aimed at studying and documenting local building materials used in the architecture of the city so as to facilitate preservation, as it seeks to study the effect of traditional building materials used in the composition of the traditional architecture of the old city of Ibb, for the first time.

BUILDING MATERIALS IN OLD CITY OF IBB

Traditional architecture in Ibb characterized being adopted in Building construction stones, this is considered important factors that made in determining the pattern of traditional construction in Ibb, it gives shape and style the architecture, and traditional materials represented in its uses clear expression over the estimated property local materials to be reformed to withstand environmental conditions of the construction, it is carried natural durability or availability of economically (Salam, 1995 , p41) .

And the availability of the finest stones in the surrounding environment of the ancient city's role in the formation of the most important features and characteristics of architecture, the literal use to build and configure most of the structural elements, because of its architectural and structural properties, check the safety of the construction and construction at the same time emphasizes the aesthetic of the building.

Other structural materials used and complementary to the work of stones, it has brought them the highest efficiency in the exploitation of their properties, in every part of the building could literally to know the structural requirements of each structural element and determine the appropriate material to him and method of construction to achieve those requirements.

Could be restricted to building materials that were used in the city and the region surrounding it follows, stones, timber, lime, plaster, clay, and "Alqdad" (Drmosh, 2010, p49). The material brick did not

use as a building material in the architecture of Ibb except in any of the minarets of mosques built by craftsmen specializing in building bricks. It was brought from the city of Sana'a in later periods.

Due reason for not building to that material for two reasons firstly represented in the absence of fuel needed and available for its production. A fuel to generate burned, another reason is the abundance of stone material (Swanson, 1997, p111). In general can be divided materials involved in the process traditional construction in Ibb in two types:

NATURAL MATERIALS

Natural materials are all materials extracted from nature and environmental ocean and that concomitant use some simple modifications, the amendments are usually pro forma for these materials and not substantial, without prejudice to its physical and chemical characteristics, and structural material maintains its natural properties is not being a modification or addition works to be converted to another material.

It needs to work without craft some of the work for processing and conducted by acts of discipline and simple modification in shape to be ready to work out, and natural materials used in the architecture of the old city of Ibb follows:

STONES

Stones are small lumps of rock, it was one of the oldest building materials known, because it has the characteristics compared to materials traditional altar, it considered of favorite items in the buildings standing (Al-Sabri, 2003, p1).

The structure of the ground in the city of Ibb and the ocean next to it is the biggest space in the form of a mountainous chains and differentiated heights of the terrain, which is characterized by mountainous topography of the distinct nature of which is investigating with agricultural settlement since ancient eras, human use of stones in all the different tools (Salam, 1995, p51). The old human Yemeni Excelled in the formulation and composition of agricultural terraces in the ocean adjacent to the city of Ibb, on the walls of chock agricultural soil to keep them from drifting as a result of Seoul rainfall, and thus formed filled the agricultural curved represent forms of contour lines of fertile soil through centuries of time (Messick, 1993, p12).

These wall stones retaining one of the key benefits of a substance in the formation of stones and the formation of the surrounding environment by making them the most important agricultural areas at the level of Yemen, on the other hand has represented builders thought stones which he made literal skill in the composition of traditional architecture.

a) STONES TYPES

The stone represented base material in the architecture of Ibb, although described as being a building stone, but they did not use either only two types of stones, the first volcanic stone, called locally "Alshesar" gray and brown (Al-Hada, 2008, p298). From quarries local, to varying degrees, according to quarry that attend them, and features fabric coarse or crystals flour and low porosity (Osman, 2000, p19). And easily trimmed in spite of its strength and hardness (Drmosh, 2010, p 49-50).

The back of another type of stones in subsequent periods is a stone sedimentary and named stone "base" orange, pink, (which features a lightweight and easy configuration and fabric porous)

(Osman, 2000, p19). But this was due not used in the foundations and basements were used in the construction of the upper floors of buildings.

The local stone was used in the construction and composition of most of the elements of the city and its landmarks "buildings and streets paved, walls, railings", and the stone a major role in maintaining this architecture to the present, and appears on its building type of autism visual because of the use literal for a particular type of stone, as in Figure 2.



Figure 2

Stone Architecture in the Old City of Ibb

Source: National Information Center, Governorate of Ibb.

b) USES OF STONES

Stone characterized by a set of physical and mechanical properties that advantage of other local building materials, and these characteristic hardness and the amount of resistance to environmental factors and their ability to withstand the forces of pressure. And featured many uses because of the availability and the appropriate constructivist their properties, we can limit these uses in Ibb traditional architecture as follows:

- Structurally: the stone used in the composition and formulation of structural elements in traditional architecture, it was used stones in the composes most of the elements of construction, it was built from the foundations and stone bearing walls as a structural, see Figure 3, and it was used the formation the elements of construction " stalactites, columns as in Figure 4, Arches as in and Figure 5 and other".

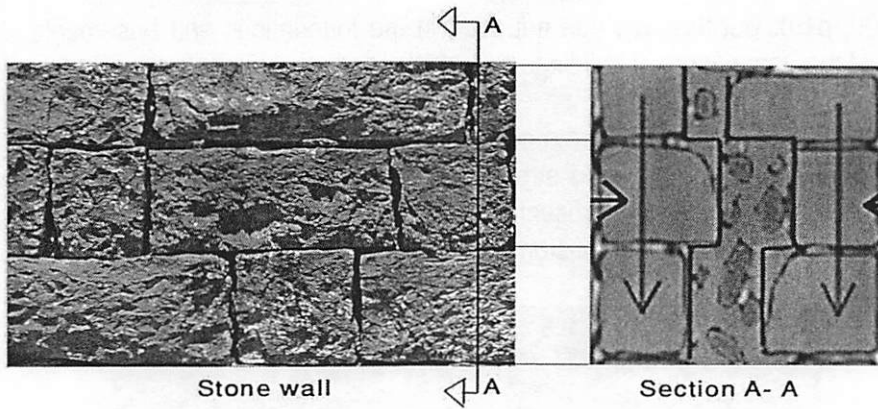


Figure 3

Interface and a Section of Load-bearing stone walls

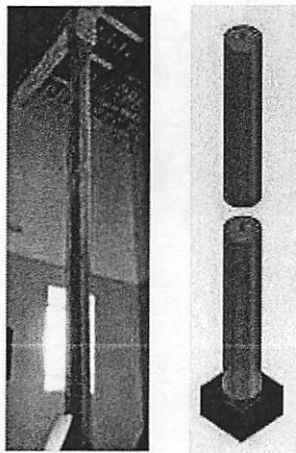


Figure 4
Stone Columns

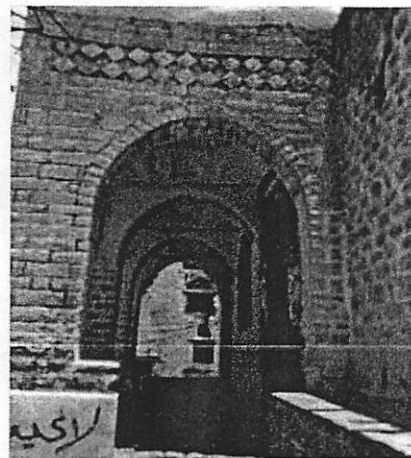


Figure 5
Stone Arches

- Decoration: stones used decorative in traditional architecture are diverse, they accounted for cornices as in Figure 6 and external constructivist motifs of different pattern type of decorative formation, as in Figure 7.

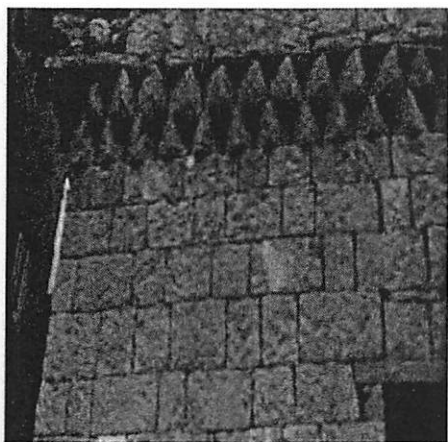


Figure 6
Stone Cornices

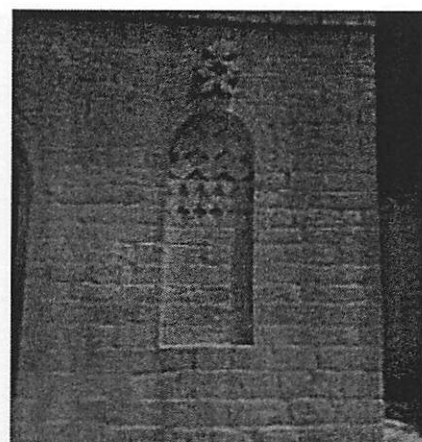


Figure 7
Inscriptions and Stone Decorations

- Finishes: the stone was used in interior finishes and terminations for internal vacuum, it was used tiles floor, and the white transparent stone was used in cover slots "Aalghemriaa" and to let in the light.
- Services: the stones were used to build and configure service buildings through a vocabulary of building services components of the construction of the traditional, such as it was built stairs buildings, as in Figure 8, it was used slabs of stone in the shade and protection for the interface of rain and sunshine as in Figure 9, also stone was used of gutters for the disposal of rainwater and use cab drivers to deliver drinking water to the buildings, tanks and mosques in the city, and stones were used in the construction of the city wall and the formation of defensive fortifications and paving of roads (Messick, 1993, p13)



Figure 8

Stone Stairs in Front of the Old Shops

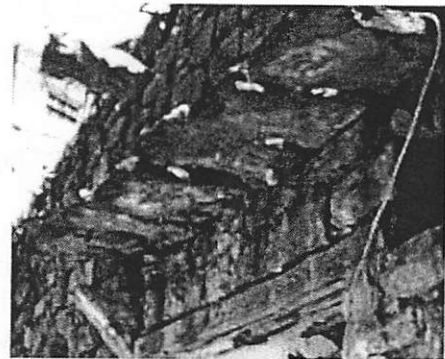


Figure 9

Slabs of Stone in Protection for the Interface of Rain and Sunshine

Literal enables of a configuration structural system based on the properties of stones, and was able to take advantage of the possibilities offered by the achievement of more use and more than one job at the same time" structure, decoration, finishes and services buildings". It was required by the needs of the building. We can say that the use of stones was integrated into more than one use in the formation of structural elements, external decoration and architectural style (Al-Ouloufi, 2004, p168).

WOOD

Wood sources vary in the city of Ibb diversity of plant cover and tries various in the environment surrounding City, and spread over large areas of the surrounding land. Trees is working to provide firewood and other wood products and works to maintain the soil from erosion and improve the environmental circumstances and other economic and health benefits of the direct and indirect (Salam, 1995, p87).

Soil fertility and rainfall has worked to increase the growth of these trees in the surrounding environment and most of the surrounding areas and is widely and various types, and is keen human Yemeni in Ibb ancient to grow these trees on the outskirts of agricultural land or in fallow land or in waterways in stream valleys.

a) PROPERTIES OF WOOD

Wood characterized by physical and mechanical properties are important, that are integrated with other building materials from through constructivism traditional techniques ruled the construction process in Ibb old architecture.

The wood has a property a light weight coupled with suitable for load resistance and durability of make itself them the same efficiencies for hundreds of years, taking into account the style cut and season saved, in addition to that a property Timber thermal insulation and acoustic insulation, operation ease, remodeled and assembled. Also wood has characteristics and mechanical properties related to the forces of reaction wood to any external force applied to them, as the forces of tension, compression and bending and shear.

Its resistance to the forces of tension, compression and bending over when those forces parallel to the fiber longitudinal wood and less when these forces perpendicular to the fiber, and the forces of shear considerably less when they are parallel to the fibers and increase when the vertical (Merritt, 2001, p4.44). It cannot be overlooked wood and defects that can be identified as follows:

1. Cracks and gum pockets and fungi (Kermani, 1999, p3).

2. Wood affected negatively moisture and water ratio (Merritt, 2001, p4.44).

Due to the nature and climate in Ibb, the humidity is high, especially during rainfall in the summer. usually tends wood to absorb moisture from the air when the relative humidity is high, and lose it when the relative humidity is low, and changes in moisture content lead to shrinkage or blowing of fiber leads to cracks in the wood (Breyer, 1999, p4.14).

b) USES OF WOOD

Human Yemeni ancient was knew the characteristics and qualities characterized the timber trees in the environment, could be used in reconstructive operations in the architecture of the old city of Ibb, and it has taken root this profession across a range of artisans and sculptors.

And wood structural and aesthetic possibilities in traditional architecture in Ibb in various patterns and formations, literal tried the old exploit and employ different ways and methods depending on the needs of its existing and quality of trees that are taken, including timber. And after stages of preparation and processing and use of the elements and vocabulary building in its different forms (palace, mosque, home, ... and others). It can be split the various uses of wood in the traditional architecture in August to the following:

- **Structurally:** timber intervention to ensure the safety of the building as solutions to connect and become a necessity to complete the process of strengthening the walls and persistence (Salam, 1995, p89). It used in the formation and establishment of floors and stairs as wooden beams (major or minor) as in Figure 10. Also small tree branches were used to cover the spaces between the beams (Evin, 1984, p20), as in Figure 11. Also wood was used in the establishment of the threshold openings, it was used in arming and linking stone walls with locally called "Al Bosot" as in Figure 12. Wood from the construction appropriate in traditional buildings of stone to distribute loads evenly between the parts of the wall and maintain the stability of the building in the case of occurrence of any partial collapse of the building.

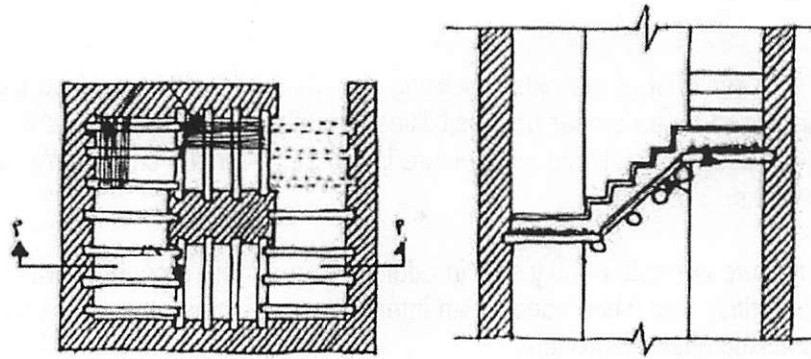


Figure 10

Wood used in the Construction of Stairs
Source: Al-Ghazali, (2005), p 55.

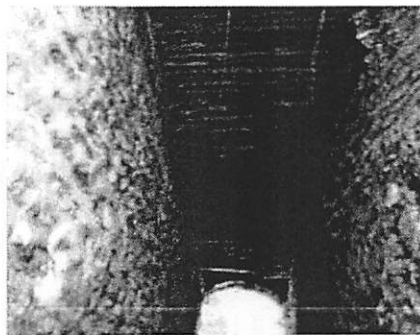


Figure 11
Small Tree were used to Cover in Roofing



Figure 12
"Al-Bosot" in stone walls

- *Decoration and finishes*: wood was used in architectural decoration through the work of the internal or external carpentry, it was used in a range of architectural elements, the most important windows, doors and "Mashrabiyya" (Salam, 1995, p89). Wood was used as decoration and finishing interior together on the carved wooden ceilings and ceilings for example, wooden ceiling decorated shaped in the Great Mosque in Ibb as in Figure 13.

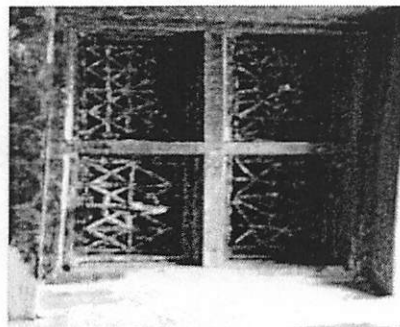


Figure 13
Wooden Ceiling Decorated Shaped in the Great Mosque in Ibb

CLAY

The Clay material of the oldest building materials known to man and used in construction, mud is characterized by a number of possibilities, it is also not without some flaws to be observed, clay material not used in traditional architecture in Ibb as in various cities of Yemen old, But through some simple works.

The mixture consists of clay soil, in addition to a certain amount of water is fermented for a certain period of time, and when used as an internal layer of internal walls is usually added to straw to minimize cracking after the drought.

a) PROPERTIES OF CLAY

Clay characterized by availability in the local environment, accessibility and regeneration continuously, simplicity to use, methods of construction varied material clay (Hanshor, 2009, p88). Also a property thermal insulation and other characteristics, although characteristics numerous clay already mentioned but it is not without flaws, and we review the negatives in the points the following:

- Clay weak to resist the influence of water resulting from rain and floods, especially in the layers of ceilings and floors, where the clay layer sucks water and weighing increasingly thus contributing to increased loads on the supporting structural elements, and consequently lead to its downfall.
- Clay material is relatively weak in carrying weights, making it unsuitable to support heavy loads, and mud weak to resist tensile forces.
- Volumetric change for clay, especially those that contain a high percentage of silt, it causes cracks when dry.
- Weakness durability surfaces clay material as a result of corrosion, due to environmental influences (rain, wind laden with sand), or due to corrosion as a result of friction when population using.
- Correlation weakness between the clay material and other building materials.

b) USES OF CLAY

Clay material being used in buildings of traditional architecture in Ibb in a manner different from other traditional architectural styles in Yemen, a set of circumstances and factors ruled this use, and we can display uses clay in the traditional architecture in Ibb as follows:

- Structurally: mortar clay used in traditional construction as a filler between the stones bearing walls (Al-Habashi & Dirmoush, 2009, p793). It was working to ensure the stability of stones on top of each as shown in Figure 14. It was used as layer settlement top wood in ceilings and floors as in Figure 15.

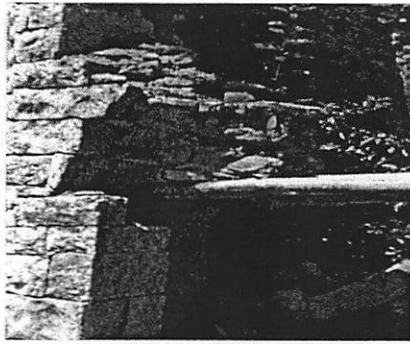


Figure 14

Clay is used as a Filler between the Stones in the Walls

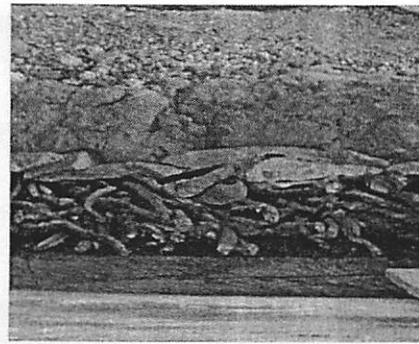


Figure 15

Clay Layer is used as a Settlement to Floors and Ceilings

- *Finishes*: clay mixture with a straw used as a layer for the settlement of the inner surfaces of the stone walls, this layer is locally called "Al-Malag".

TRADITIONAL MATERIALS MANUFACTURED

Manufactured materials are the materials resulting from the addition and modification of traditional natural materials through a set of traditional processes, as heating and cooling, grinding and calcination and other processes, these processes vary according to the material and natural characteristics of the material to be produced, these operations going through more than one stage. In all these operations and additions can be defined as "traditional manufacturing," and those materials plaster, and lime.

PLASTER

Plaster is a white Material of the most materials used in the construction of the building in the Yemeni external and internal finishes, Material was extracted from the mountains calcareous is a limestone Ca(OH)_2 (Al-Hadari, 2006, p108). Plaster was used in decorating the interior and exterior architecture as an additional layer added to the walls and ceilings of buildings, usually it was used in important buildings such as mosques and palaces, it did not know of any use in the public housing, but in a minimalistic (Swanson, 1997, p112-113).

a) PROPERTIES OF PLASTER

Material plaster characterized by rapidly hardened and paste stones together, it offers the possibility of control at the time of intransigence to change the percentage of water in the mixture, is also characterized by resistance high fire. Plaster affected negatively the presence of water and increase the humidity. It was used in traditional architecture in Ibb in the finishes and interior decoration of buildings because it was affected climatic and environmental conditions surrounding and Ibb climate known to frequent rain and increased humidity, especially in the summer.

b) USES OF PLASTER

Plaster was used as a material for decorating the interior architecture in the city of Ibb, but did not have any role in the construction process at all, the material was used in traditional architecture in the following:

- It was used as inscriptions and decorations on the internal surfaces of the important buildings, Process is covered surfaces of walls and ceilings with a layer of plaster a literal shall thereafter draw and define a set of motifs and inscriptions on that layer, the sculpture comes after that, bodies of internal voids architectural decoration in a variety of finishes and configurations. It can be divided into (floral decorations - decorations engineering - linear motifs) (Nafie, 2008, p9). Some colors were added to the decorations and inscriptions for beautification as shown in Figure 16.

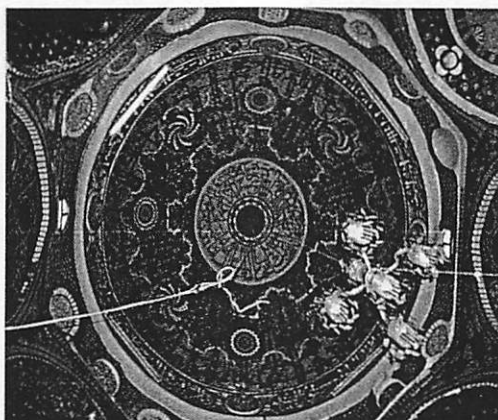


Figure 16
Inscriptions on the Inner Surface of Domes in the Great Mosque in Ibb

- Plaster provides the possibility of controlling the time of intransigence, this feature helped engravers in use in the formation of "Aalghemria" for the survival of the mixture moist during the completion of the inscriptions and decorations, "Aalghemria" consists of a mixture plaster with water, carved engravers decorations in various forms, and those covered with colored glass ornaments (Drmoush, 2010, p128).

LIME (HYDRATED LIME)

Lime is a material hydrated lime, it was known chemically calcium hydroxide with a white color, it was used in the composition of material "Alqdad", also it was used in the coating external and internal walls of buildings (Drmoush, 2010, p51). It is a limestone (calcium carbonate) is heated so-called "calcination" in ovens private for the production of lime (calcium oxide) is then added to the water a process called "extinguishing" consists thus calcium hydroxide (Abdo Al-Naeem, 2009, p111).

a) CHARACTERISTICS OF LIME

Lime characterized by the strong cohesion with building materials that are added to it, Walls increase the resistance against environmental influences and erosion, lime help improve the physical properties of building materials because of its ability to reflect sunlight. Its flaws cannot be stored. it ability to absorb carbon dioxide in the atmosphere to interact with him again to be calcium carbonate, as the method of preparation needs time and specialized skills in addition to high temperature. The most important characteristics of lime follows:

- Lime rapid sclerosis and moisture-resistant.
- Lime material easy execution by mixing with other materials or used individually.
- It is gaining strength cohesion when used as a link between the stones (Al-Thawr, 1994, p6).

b) USES OF LIME

Lime used in traditional buildings of Ibb city as a supporting and finishing material. It used to make the increasing the coherence and strength of construction and improve the appearance of buildings, lime used in traditional architecture in Ibb through the following:

- Lime was used in coating the walls of buildings. It was used in Interfaces of buildings with around the openings and the upper floors. Also lime was used in the coating interior vacuums as in Figure 17, It was used the top layer clay to increase its strength.
- Lime mortar used as a link to the construction work, and it is mixed with other materials to form a Material called locally "Alqdad", Alqdad consists of mixing lime with small gravel called "Alhashash" by approximately (1 lime : 2 gravel), Alqdad was used in coating the walls of bathrooms, exterior surfaces, the foundations of buildings, ponds and waterways, and other places that require a function not to allow entry into force of water or moisture, as in Figure 18. "Alqdad" characteristic cohesion and high density.



Figure 17
Lime was Used in the Coating Interior
Vacuums

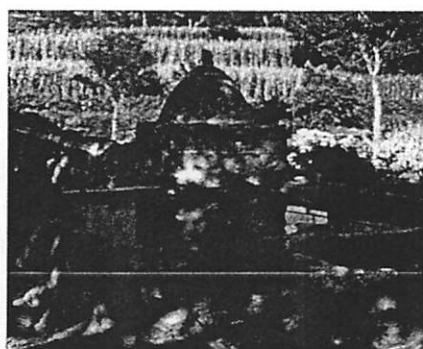


Figure 18
"Alqdad" Used in Streams and Pools of
Water
Source: National Information Center Ibb.

DIFFERENT USES OF BUILDING MATERIAL:

Architectural and construction uses varied local construction materials. Formed according to the characteristics of each material technology for optimal use and in line with the actual needs of them, this thought in the optimal use appeared in spite of the simplicity and lack of technical materials used. It can be summarized uses for these materials as in Table (1):

	Structurally	Decoration	Finishes	Services
Stones	●	●	●	●
Wood	●	●	●	
Clay	●		●	
Plaster		●	●	
Lime	●		●	

Table (1)
Different uses Local Building Materials in the Architecture of the old city of Ibb

Through the above table, it is clear that the precious material was the main material in the construction and to influence and contribute to the most effective in the composition of traditional architecture in the city of Ibb . Stones marked by the characteristics and qualities of constructivism, in addition to availability in the surrounding environment make it the most widely used in the composition of construction, decoration and terminations and finishes, in addition to configure services for the building and the city in general.

Wood material had a major impact in the composition of traditional architecture , where characteristics contributed to use it as an essential part in the formation of secondary elements of construction , in addition to its primary role in interior decoration, and its role in finishing and termination through the creation of architectural elements and vocabulary internal and external.

On the contrary Architecture Yemeni cities Other adopted architecture city of Ibb old configured on the material stones, did not appear to use clay except the narrowest limits, where it appeared used in secondary and complementary in the composition of construction walls bearing your item filler between the stones just did not have any role Structural, while the use of the finishing layer and an end to the internal walls only.

While the most important internal voids in religious buildings and palaces were gypsum material is the most widely used material in the formation of the internal architecture. Finishing layer and an end to the internal walls, in addition to its role in the decoration and decoration and configure wall and ceiling decorations, in addition to the use of gypsum in the formation of "Alqamariaa" structural element characteristic of traditional architecture.

Lime appeared used in traditional architecture in two forms. It was used the first represented in being material to paint the walls of the home and abroad, the other used in the composition of mixture "Alqdad" article that resemble cement in their work, where he was to "Alqdad" a major role in the construction and maintain the vocabulary and architectural elements and construction of the architecture of the city.

RESULTS

Traditional architecture in Yemen has generally been able to take advantage of the characteristics and attributes of traditional building materials. Formed through different architectural patterns characterized each of the geographic regions. In the traditional architecture of the city of Ibb marked pattern of construction stemming from the thought of the optimal use of local materials with traditional style and character unique, where distributed various types of building materials in the environment of the city, where possible division of the materials used in this architecture to natural materials (stone, wood and clay), and materials manufactured or "processing" (lime and gypsum), and research found the following results:

- Material stones represented the basic material in Ibb old architecture due to the abundance, in addition to the structural characteristics of the material. Stones used structurally in the system configuration, load-bearing walls, and elements of construction Other (columns and stalactites and domes), in addition to use in the works of terminations and interior finishes of the vacuum as tiles for flooring, and used the stones as well as decoration and ornament and trim of the walls (cornices and decorations structural external), and the integration of its role in use as services of the building (the stairs of the building configuration, stone slabs to shade and

protect openings, gutters to drain rain water). And gave the use of a particular type of stone in peppered unified visually on the premises.

- Material wood had a major role in the architecture of the old city, and the diversity of use where it appeared her role structurally (beams, wooden ceilings and floors upper arm load-bearing walls of stone, including the so-called "Al-bosot", configure the threshold openings), in addition to the role of the joint venture between terminations and the interior decoration of the spaces (wooden ceilings carved, "Mashrabiyya", carving and decoration of doors and windows). It was to be used in the role integrate with precious material in the construction of traditional architecture of the city.
- Clay material used as a help in the construction process, did not show a significant role in building the architecture unlike what appeared in the Yemeni cities Other, due to the increased proportion of rain and moisture in the atmosphere of the city of Ibb, and appeared used structurally (Article filler between the stones bearing walls), in addition to used in the internal terminations (configure layer "Mlaj", composition layers Bishop and the upper floors).
- other materials appeared resulting from processing "heating" calcining limestone or add other materials to form materials constructivism new, and that material substance gypsum used in the finishing and decoration of inner emptiness of buildings and religious palaces (decorations gypsum wall or ceiling, configure Lunar). And limited use in interior finishes on the opposite building some other Yemeni cities because of the large affected by moisture and rain.
- Material lime of building materials manufactured and used in terminations and interior finishes (material coating and paint the walls from the inside), in addition to its role in the formation of the article "Alqdad" used structurally strengthen the surfaces covered by, and to prevent leakage of water through it, therefore, used as an end(Preference ceilings, in the walls of the bathrooms layer, foundations), where he helped use substance Alqdad in the increased durability of its buildings for long periods of time.

CONCLUSION

From what reported so far, it is clear that there is a role an effective and important contribution of building materials local composition and formulation of traditional architecture in the city of Ibb old, formed architecture took root from which thought architecture is based on the exploitation of the characteristics and qualities that characterize these materials and commensurate with the functional requirements list of the various buildings and functions.

RECOMMENDATIONS

- Natural resources conservation for local construction materials from the indiscriminate use of them. The research recommends the local authority for the city to issue legislation that determine the consumption of such material.
- Prepare a list of the characteristics of building materials in the architecture of the old city of Ibb, and specifications as evidence an executive at the conservation of historical architecture. The research recommends for the organization historic cities in Yemen to do this role.

REFERENCES

- Abdo, M. A. (2007). To Clay in Yemen with Special Reference to Climatic Conditions. (Doctoral dissertation). Karlsruhe University. Germany.
- Abdo Al-Naeem, O. T. (2009, 30-31 March). Architectural Ornaments and Decorations interfaces traditional houses of Aden. The second Engineering Conference, Faculty of Engineering. Aden University. Yemen. pp. 101-113.
- Al-Habashi, A. & Drmash, A. (2009, December 16-17). Traditional Materials and Construction Techniques in the Yemeni city of Ibb: methodology for rooting local contemporary architecture. Fifth International Conference, Cairo University. Egypt. pp 791-801.
- Al-Hada, Muhammad. (2008). Traditional architecture in the old city of Ibb and with the surrounding environment. The Journal of university researcher. Ibb University. (19). pp 291-307.
- Al-Hadari, A. M. A. (2006). Art and Engineering Construction Sana'ani. [1st ed.]. Sana'a: General Book Organization.
- Al-Hazmi, A. M. (2009, March 30-31). The Architectural style of ancient cities in the Arab world - a comparative study. The second Engineering Conference, University of Aden. Yemen. pp 247-262.
- Al-Ghazali, A. S. (2005). The impact of Technology and new Building Materials on the local Architecture in Sana'a - Yemen. (Master's thesis). Al-Azhar University. Egypt.
- Al-Ouloufi, M. M. (2004). The Characteristics of Yemeni Architecture. Yemen: Ministry of Culture and Tourism.
- Al-Sabri, A. M. & Al-Ganad, I. N. (2003). Construction and Ornamental Stones in Yemen Geological Survey and Mineral Resources. Yemen: Ministry of Oil and Minerals.
- Al-Thawr, Y. A. (1994). The Development of Volcanic ash mixture with hydrated lime (Alqdad) as a coating material in Yemen. (Graduation Project). Department of Civil Engineering. Sana'a University. Yemen.
- Breyer, D., Fridley, K. & Cobeen, K. (1999). Design of Wood Structures ASD. [4th ed.]. New York: McGraw-Hill.
- Drmash, Ali. (2010). Contemporary architecture in Yemen between construction systems and the traditional form: a study on the city of Ibb. (Master's thesis). Monoufia University. Egypt.
- Evin, A. (1984). The Yemen Arab Republic: Economic Development and Architectural Change. Aga Khan Program for Islamic Architecture. (2), pp 1-21.
- Hanshor, A. (2009). Natural Building materials and their impact on the multiplicity of architectural styles in Yemen. Journal Building Technology. (19), pp 84-93.
- Kamona, H. & Abdul Wahid, O. (2010). Employing local environmental resources in the establishment of constituent units of the urban fabric within the framework of preserving the architectural heritage. Journal of the Planned Development. (22), pp 1-20.
- Kermani, A. (1999). Structural Timber Design. [1st ed.]. Oxford: Blackwell Science.
- Merritt, F. S & Ricketts, J. T. (2001). Building Design and Construction Handbook. [6th ed.]. New York: McGraw-Hill Companies.
- Messick, B. (1993). The Calligraphic State Textual Domination and History in a Muslim Society. (Doctoral dissertation). University of California. U.S.A.
- Nafie, Aida. (2008, October 19 - 22). Parietal design philosophy in the method of distribution of the elements of the automatic Arab housing. International Scientific Conference - Fine Arts in Egypt

- 100 years of creativity. Faculty of Fine Arts. Helwan University. Egypt. pp 1-14.
- Osman, A. A. (2000). Construction Stones and Traditional and extractive industries in Yemen. [1st ed.]. Sana'a: Dar Hodhod.
- Salam, Sultan. (1995). The impact of modern construction technology in the style of traditional Yemeni architecture. (Doctoral dissertation). Helwan University. Egypt.
- Siegesmund. S and Snethlage. R. (2011). Stone in Architecture Properties Durability. [4th ed.]. Berlin: Springer-Verlag Berlin Heidelberg.
- Swanson, L. A. N. (1997). Historical considerations in Yemeni vernacular architecture: Houses from the Sulayhid dynasty (439/1047) to the modern period. (Doctoral dissertation). The Ohio state university. U.S.A.

IS A SUSTAINABLE URBANISM POSSIBLE IN 21 CENTURY EGYPT? A FUTURE DIRECTION FOR WALKABLE SETTLEMENTS

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ABSTRACT

Looking for the typical Egyptian urban form reveals that the compaction pattern with high density, high diversity of activities and mixed uses is the common form. In contrast, new cities have not only been built on a different pattern but also this pattern has no design references to the Egyptian context. This study will identify the sustainability of the current urban form in the new Egyptian cities and indicate the roles of compaction on their sustainability are not covered in academia. Hence, a focus group was conducted, as a semi- structured discussion; a poll survey was done with the aim of testing the questions and their logical flow and obtains some preliminary outcomes. There is widespread faith in the compact city model's ability to promote urban sustainability, high densities and mixed uses are the two key concepts formulating the overall sustainable patterns of cities and creating sustainable urban form.

Key Words: *compaction, density, Egyptian cities, walking/cycling, connectivity.*

1. INTRODUCTION

The current settlement strategy in Egypt is relatively new and seemingly borrowed from the West, consulting offices from Western countries, were invited through the NUCA (New Urban Communities Authority) to plan and develop the first generation of new cities in accordance with governmental regulations (Salem, 2007; Shalaby, 2003) and therefore would most likely have negative impacts on developing these cities (Hegab, 1985). Therefore, critics questioned whether criteria and standards had been established for the creation of these cities. Indeed, development criteria and standards had been established that emerged from Law 49(1979) but there is no indication of the efficiency of these criteria (Hegab, 1985). The law is "blind" in not determining the principles of the low and medium- income neighborhood of the high- income (Focus Group, 2009).

In view of the scale of prospective development, it is vital that we mobilize the knowledge which now exists to build communities in which people can lead happy, successful and sustainable lives, and which add to rather than detract from our civic and cultural heritage. Many of the development models used in the second half of the twentieth century failed to achieve these outcomes, and the theme of this paper is that the principles of sustainable development must be observed in future if similar urban disasters are to be avoided in the coming decades. With the aim of testing the questions of this paper, and obtains some preliminary outcomes, this was achieved through sending an invitation emails to 40 members who were selected as experts in research and practice field. The email had a one-page survey questionnaires as an attachment that generally measured their thoughts about the factors affecting the formulation of new settlements and cities in Grater Cairo Region, as well as their rational opinions towards intensifying these cities. A pilot test was designed to assist the researcher to examine the forming of the groups, and help in moderating the session which held at the Society of Egyptian Architects on November 2009.

2. URBAN FORM

A number of elements conspire to produce this outcome. One is a view on the part of some developers that sustainable developments are more complex and are therefore likely to be less commercially attractive than simply rolling out conventional layouts. Another is that maximizing the value which sustainable developments are capable of creating may require a longer- term commitment on the part of landowners, investors and developers than many are comfortable about making, subject to current business conventions and practices. Indeed, the very limited involvement of the investment sector within this area of the market is perhaps a symptom of the problem.

If there is a good commercial case for sustainable urbanism, of which landowners and developers need to be aware, it is equally true that many social benefits are associated with good urban design (Prince's Foundation, 2007) which governments and planning authorities need to take note of when issuing guidelines for urban developments in the coming years.

2.1 CHANGING PLANNING PROCESS

Thus, development of the new cities in Egypt was determined as a result of political decisions rather than "rigorous planning"(Remali, 1985). Elsadik (1992) argues that reading about the factor affecting existing urban communities was the guide for the spatial segregation between uses in the new cities. The new- cities policy was, therefore, initially based on the separation the uses and principally the segregation between residential uses and administrative or sometimes, commercial uses (Barada, 1992), and this led to a greater insight how planning process affects the formulation of urban form. As a result, many argue that this new products is not compatible with local citizen needs or environmental challenges, and therefore fundamental changes have recently taken place for the new Egyptian cities, particularly those whining the greater Cairo region (GCR).

2.2 CHANGING OF THE ROLE OF THE DEVELOPER

The urban form is affected not only by non- appropriate planning standards, but also by the transformation of planning process and the role of developer. The new town program was originally designated to be carried out and financed by public governmental funds and this led to some ramifications of planning process. Recently, in the late nineteen hundreds, the planning process witnessed considerable changes in their framework (Salem, 2007). Egypt has been pushed into transforming its economy to a free market economy because of huge pressure from outside forces (Bayomi, 2009; Stewart, 1999). The government sold large portions of un-reclaimed public desert land to real estate developers to finance housing development with the support of major public and banks (Fahmi&Sutton, 2008).Most GCR new towns assets are sold to the private sector, leaving the arena of developing these towns in the hands of private developers, the new satellite cities around Greater Cairo, are now home to a growing number of resorts ,golf courses, theme and amusement parks that offer tremendous entertainment facilities (Saoud,2002)

2.3 CHANGING THE URBAN FORM

As discussed above, the urban form of the new Egyptian cities has been influenced by various dimensions that ultimately produce a very low density pattern. None of these dimensions are aimed to producing a future sustainable community, but rather a modern (Focus Group, 2009), and profitable community (Bayoumi, 2009). Consequently, it is remarkable that most of these dimensions affecting the urban form led to a very low density and a non- mixed-use pattern, in strong contrast with the concept of Egyptian traditional cities or the requirements of the desert communities.

Due to the shortage of recent data, the study depends on measuring gross, urban and residential densities to describe what the current urban form of these new cities looks like. Yet, residential density is the best indicator describing the urban form because the other two are affected by factors such as the city role or function. As seen in figure (1), 10th of Ramadan, for example, is a very low – density city in terms of gross density (3P/F); however New-Cairo city is a very relatively high- density city (NUCA, 2008). This is because 10th of Ramadan city is designed as an industry center and hence large areas are dedicated to non- residential uses, in contrast with the residential New- Cairo city (NUCA, 1989). Moreover, regarding the up- to-date states, 15th of May has the highest current urban density (52P/F) but this density does not reflect the real urban form of other cities because they include large areas for non- residential uses. Considering the residential density of Cairo districts that are similar the new cities, their density varies between 250 and 350 person per fedan (Nippon Koei Co& International, 2006), and this is far from the target density of most of the new cities. Therefore, these facts point out how differently the new cities have been developed – it means, low density is a general feature of these cities.

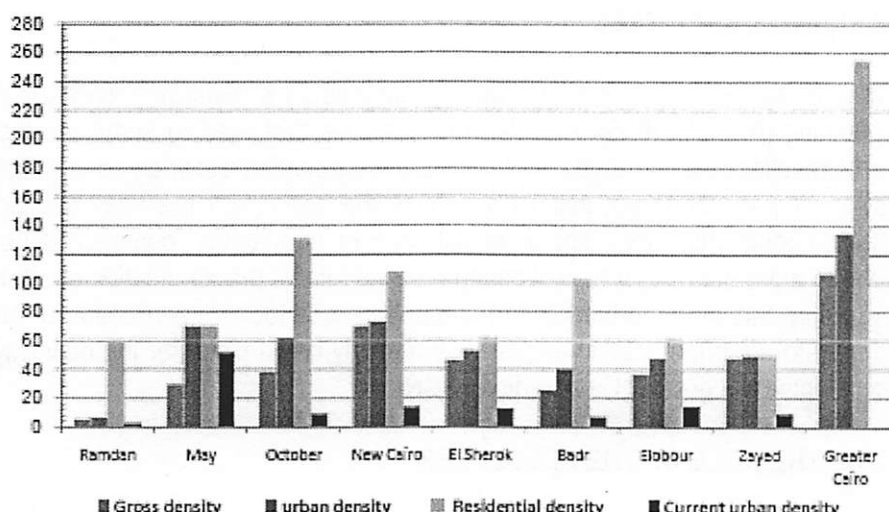


Figure .1
Gross, urban and residential densities for the GCR, s new cities

Source; Based on (Nippon Koei Co& International, 2006; NUCA 1989, 2008)

There is no correlation between street pattern type and residential density although density has a strong impact on land usage, and is also related to the presence of amenities within a district. The strongest predictor of residential density is land price, with higher densities occurring where land prices are high. Household affluence is the primary indicator of land consumption, followed by a household's stage in the life cycle. The higher the income of a household, the higher the likelihood that it occupies a single-family detached house. Similarly, the presence of children is closely linked with the consumption of a detached house. Street patterns have never been associated with a specific residential density

3. SUSTAINABLE COMMUNITIES

A general assessment of the new Egyptian cities are seen as environmentally or socially sustainable, notably the new gated communities offer similar promises such as "healthy environment, comfort, convenience, various community services, peace and quiet" (Kuppinger& Collage, 2004) and a "prestigious suburban lifestyle attained by common features such as a lush manicured, architecture character, security, and distinctive amenities, and service facilities (Yousry, 2009). The pace of upsurge

of these luxury gated communities produces other new pattern that are not likely to be found in the rest of the Egyptian cities, therefore, the new communities around Greater Cairo that have witnessed " an unprecedented boom in new desert development schemes of gated luxury communities"(Beards, 1995) are evidently not the traditional model, and perhaps not sustainable. Of course, some of these communities may succeed in attracting residents but they are still " a city within a city '(Yousry, 2009) which definitely creates shorter commuting on local scale but also leads to "Longer commuter journeys and congestion"(Landman, 2000) on the city scale. Thus huge daily and weekly trips are generated between these communities and GCR, and also whining the new city itself. For example, in 6th October city, which includes a high number of gated communities, car ownership is relatively high(about 130 per 1000 capita) , while in other cities such as 15th May it does not exceed 42 per 1000 capita (Shourbagy2009). The problem has become more complicated since it is coupled with the high rate of car ownership.

The poor level of purchasing for certain types of shops and commodities, the long distances between housing and services in the light of non- compactable public transportation system are reasons for creating new unplanned patterns of mixed use (Focus Group, 2009) .The new pattern is achieved by the distribution of commercial uses on scattered sites whining the neighborhood , and it usually conforms to the vertical mixed-use prototype "living above shops", furthermore, a walkable mixed-use area or street is another pattern that is recently found in the new-city center and some gated communities in the south-east of October city (NUCA, 2008). In practice, gated compound projects all have the creation of community through architecture and design as one of their lead themes in advertising and promotion.

Factors that influence the choice to use motorized or non-motorized transport are based primarily on two fundamental aspects of the way land is used: (a) proximity distance and (b) connectivity- directness of travel. Other factors, such as travel cost, environmental quality, and aspects of convenience and access are also likely influential. Figure (2) illustrates two distinct community designs. The top portion, above the large street that horizontally bisects the figure, depicts a traditional layout. The community of the top requires one to traverse large distances within the given street network to achieve actually relatively short straight- line distances (low connectivity). In contrast, the community on the bottom provides an interconnected street network and more direct and shorter pathways between where trips would start and end (high connectivity). The top community also possess lower density of land use per unit area and poor land use mix , whereas the bottom community integrates , within small areas, more and different types of land uses.

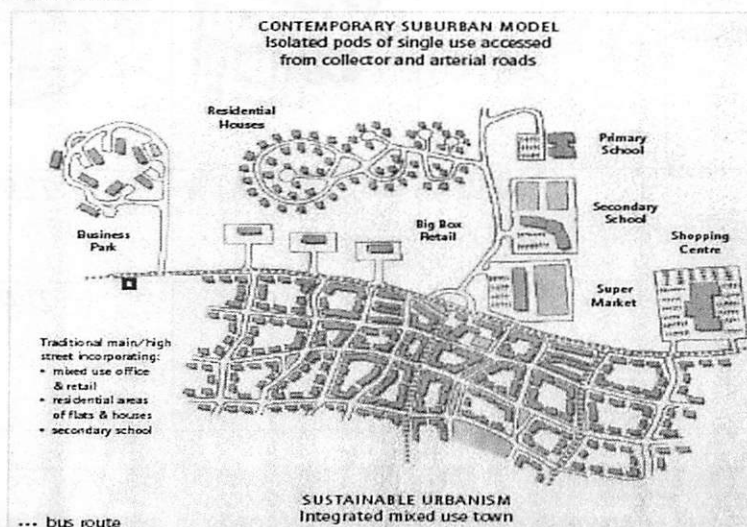



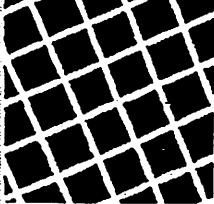
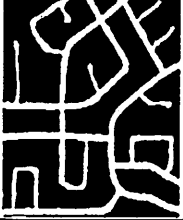


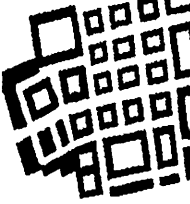


Figure .2

Two distinct community designs Spielberg. (1989)

3.1 STREET PATTERN

Loop and cul-de-sac street patterns have evolved from 1900 to the present (see Table 1). Their geometry is adapted to the automobile excluding traffic at the local street level and permitting good flow at the collector and arterial levels. By contrast, the grid patterns that predate the automobile have required major adaptations such as one-way streets and traffic lights in order to achieve good automobile traffic flow. Contrary to the focuses group, opinion, the curvilinear streets that are typical of conventional suburban subdivisions are not inefficient; they reflect an aesthetic preference and have little impact on land consumption. While irregular lot shapes do not pack efficiently, this is of relatively little consequence at low densities. In fact, for comparable residential densities, loop and cul-de-sac street patterns are more efficient than gridiron geometry pattern (which is why they are preferred by most developers). According to the technical literature on street planning, conventional suburban street layouts consume 16-25 per cent less land than the grids advocated by new urbanism (see table 1.)

Table 1
Comparison of area used for streets, among four typical patterns

Street configuration				
Street patterns	Traditional (before 1900)	Gridiron (c. 1900)	Warped parallel (c. 1970)	Loops and Lollypops (c. 1980)
Street formations				
Percentage of buildable area	76.3%	68.6%	72.6%	65.0%
Percentage of area for streets	23.7%	35.0%	27.4%	36.0%

On the other hand, when congestion occurs on arterial roads in a loop and cul-de-sac system, it is generally caused not by the street network but by the segregation and concentration of homogenous land uses such as regional shopping malls or office parks. However, street patterns like the loop and cul-de-sac, which are designed for the automobile, are poorly adapted to pedestrian traffic. Indeed, their

discontinuity inhibits pedestrian access to facilities and amenities, while their curvilinear aspects lengthen and confuse walking trips. (CMHC, 2007).

4. SURVAYING ANALYSIS

Accordingly, the focuses group concluded that there are two burning contractions in the context of intensifying the new cities. The majority support intensification in terms of a better social environmental and economic viability but there are a few against this dogma. The poll survey simply asked professionals on their views towards intensifying new cities through three processes: infill development by mixed use, infill development by increasing density and outskirts development on higher density. (See figure 3). Most of these opinions support intensification by mixed- use development (90% of the total response) and building the new development on a higher density (85% of the total response). A small proportion holds with the third process, identification through increasing the density of the built – area (35%of the total response).

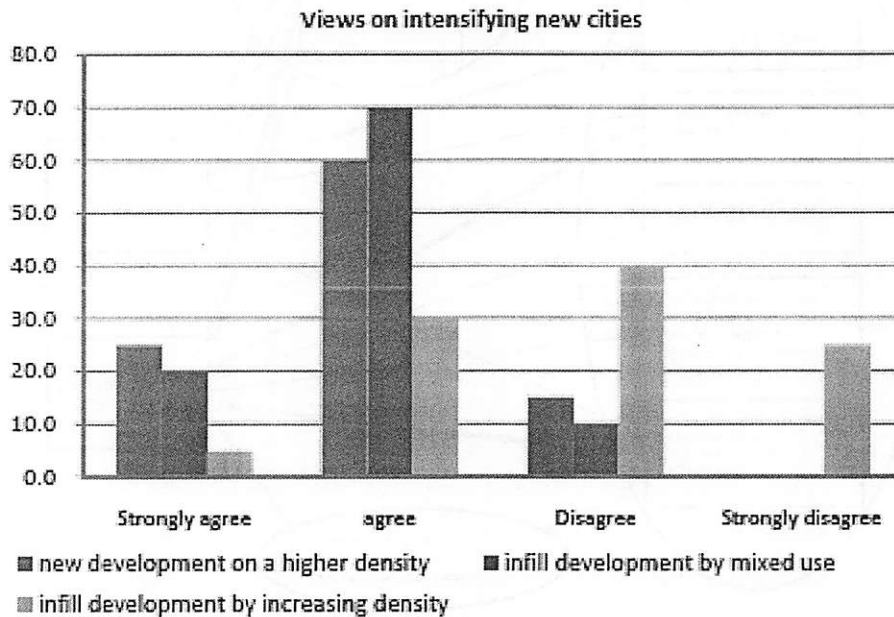


Figure .3
Different views on intensifying new cities

4.1 FUTURE DIRECTION FOR WALKABLE SETTLEMENTS

Settlement environment characteristics were related to walking and cycling for transport is virtually all of the studies reviewed. The strength of the associations varied but was usually substantial. Virtually every study demonstrated associations between environmental variables such as density, connectivity, and land use mix and walking/ cycling. Residents from communities deemed high walkable according to environmental characteristics had higher rate of walking/ cycling in comparison to residents from low-walkable communities.

Correlation analysis and regression models that provide continuous measures of settlements characteristics can quantify the relation between settlement environment characteristics and no motorized transport while controlling for either or both individual and settlement socio-demographic variables (e.g., age, income, car ownership) known to be associated with walking and cycling.

Population density is among the most consistent positive correlates of walking trips, and employment density were independent positive correlates of walking rates for commuting and shopping purposes. An examination of 32 cities around the world revealed a positive association between city population density and the percentage of workers walking or cycling to work (Newman& Kenworthy, 1991)). Land use mix, especially the close proximity of shopping, work, and other nonresidential land use of housing, appears related to greater walking/cycling among residents. In contrast, long trip distances are negatively related to the likelihood of walking/cycling.

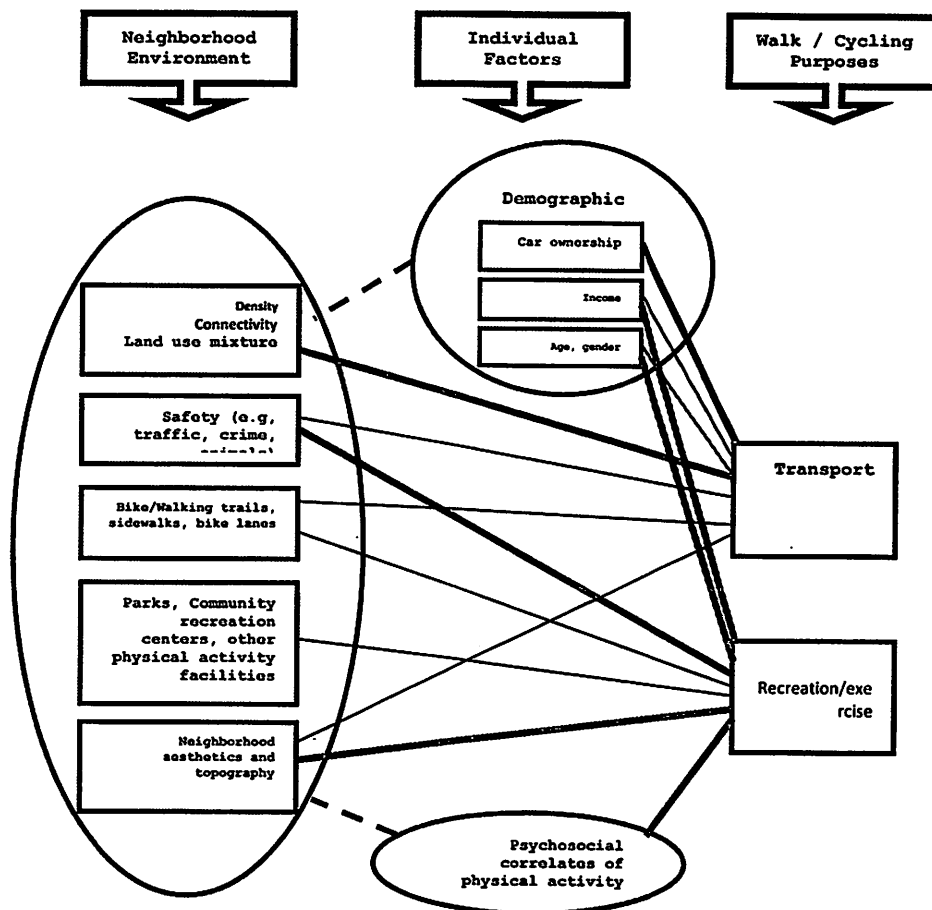


Figure .4

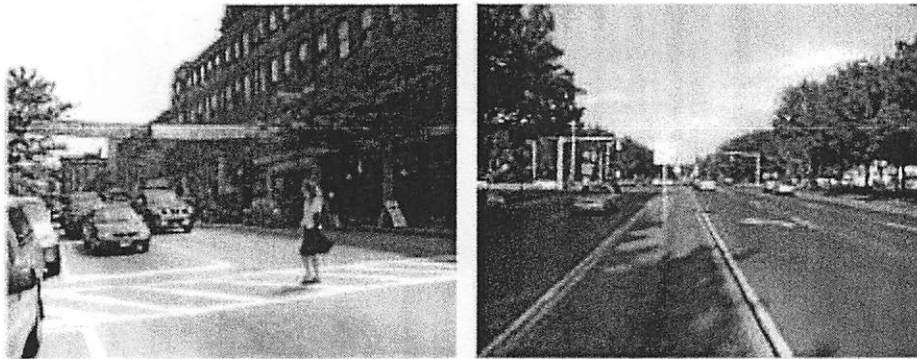
Proposed ecological model of new settlement environment influence on walking and cycling

The walking and cycling infrastructure has been evaluated infrequently in relation to transport choice. Some empirical evidence suggests that sidewalks and bicycle paths increase the number of walking/cycling trips (Kitamura&laidet, 1997)) .when sidewalk continuity is used as one of the criteria for determining settlement walkability It may also fruitful to examine interactions of environmental and psychosocial variable as well, in addition to the interaction environmental and socio-demographic variables known to influence physical activity. Figure 4, seen a proposed ecological model of new settlement environment influence on walking and cycling. Double lines denote stronger relations; single lines denote weaker relations; dashed lines denote mediated relations.

4.2 WALKABILITY

Satisfaction surveys of suburban residents often mention walkability; Walkability implies comfortable

access to amenities such as schools, recreation areas, retail stores and workplaces. The presence of these, amenities can be affected by a street pattern but clearly no determined by it alone. However, in many conventional suburbs discontinuous, indirect and confusing street patterns of loops and culs-de-sac compromise accessibility. In addition, collector and arterial streets are inhospitable and unsafe because of high traffic volume, thus discouraging pedestrian use. Recent new urbanism-type subdivisions that have adopted the grid pattern create clearer and more direct pedestrian routes. Yet the amenities in these communities are generally beyond the five-minute walking distance desired by today's consumers. Walkability demands both a conducive street pattern and equally important, a proximate arrangement of land uses.



Traditional SiteStreet Cotemporary SiteStreet

Figure. 5
Comparison between traditional and contemporary Site Street

4.3 STREET QUALITY

The perceived quality of a street depends on both physical and operational attributes, some of which are incidental, while others are designed. Street life, visual complexity, social status and population density are incidental attributes dependent on culture and history. On the other hand, safety, security, comfort, and a sense of enclosure are functions of design. In addition, physical attributes, whether designed or incidental may be reinforced or undermined by operational attributes such as the level of maintenance and cleanliness. (Spielberg, 1989) Taken as a whole, these attributes produce a memorable image and a pleasurable feeling in the user, expressed as sociability, walkability, and delight to the pedestrian and driving ease and safety to the driver. (See figures 5&6)

Sociability of a street is critical to its quality. Informal contacts that develop into social networks are at the root of feelings of belonging and security, which are prime factors in resident satisfaction. Street activity cannot be designed but it can be encouraged or inhibited by certain street characteristics. The most negative influence on sociability is heavy car traffic, whose negative effect is proportional to its volume. To the extent that a street pattern encourages speed as wide through street it will invite more traffic. To enhance sociability, particularly with regard to children's safety and play, most traffic experts recommend discontinuous street patterns of the kind found in conventional loop and cul-de-sac suburbs. Such street patterns consistently show a lower rate of accidents and a higher level of perceived security. (CMHC, 2007).

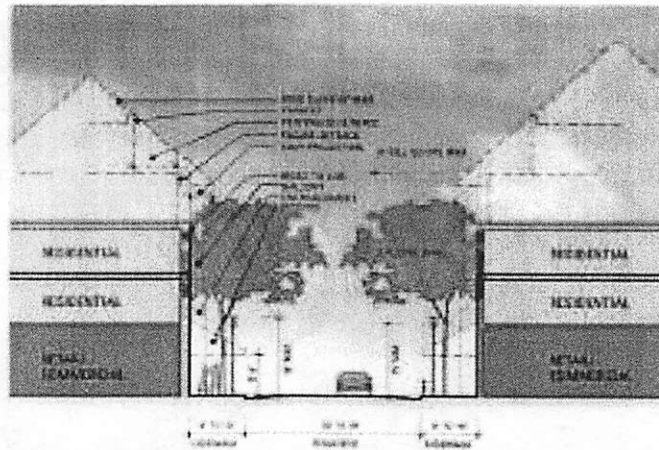


Figure 6
Proposed sustainable street (CMHC, 2007)

4.4 RESIDENTIAL STREET PATTERN DESIGN

A recent study by the IBI Group for Canada Mortgage and Housing Corporation (CMHC, 2007) concluded that the top three determinants of the amount of car use in the suburbs are: the number of people per household, the distance from the central business district and, above all, the number of cars per family. Car ownership is related to the number of persons per household, household income, and house size (an indicator of household wealth). Thus, car ownership, family size and household location have a far greater influence on auto travel than the type of street pattern, which ranked ninth in influence. While street patterns, ranked ninth in influence. (CMHC, 2007). For users, the two predominant suburban street pattern alternatives loop and culs-de-sac, or grid have distinct advantages. Discontinuous streets with loops and culs-de-sac provide safety, sociability and efficiency; continuous grid patterns provide connectivity and easy orientation. To create streets that provide all these attributes requires combining the two patterns. Such a combination would have the following characteristics:

- It would return to orthogonal geometry for clarity of organization and directness of pedestrian access;
- It would provide loops and cul-de-sacs for local streets.
- It would use open space as a structuring element of the layout for connectivity, relief, comfort, water retention, interaction and delight.
- It would adopt a road hierarchy of local, collector and arterial for distributing and moving car traffic effectively;
- It would transform arterial roads from mere traffic conveyors to activity generators. The aim of this new combined street layout is to prevent non-resident through traffic, to maximize the number of house on culs-de-sac and loops, to situate open space for maximum accessibility and to accommodate a range of housing types.

5. THE SOCIAL CASE OF SUSTAINABLE URBANISM

It is true that many social benefits, especially in the form of reduced carbon emissions; reductions in

crime and the fear of crime; improvements in health and well-being; and the reductions in social exclusion and economic benefits associated with important features of sustainable urbanism such as mixed tenure and mixed use.

The principles of sustainable urbanism are not yet being widely applied on the ground, the problem of delivery is multifaceted, however we would underline two key aspects: Property investors, developers and landowners suspect that sustainable communities, with their mixed use, mixed tenure layouts and precedence for pedestrians and public transport users over the car, are more costly to plan and develop; and planning authorities are not well enough informed about the social, environmental and economic benefits which are associated with sustainable development.

The focuses group believes that if we can understand and apply time-tested principles, building in a sustainable way, we will reap improvements in public health, in livelier and safer streets and in a more affordable lifestyle for families and individuals. They also believe that the communities exhibiting these sustainable characteristics will increase, rather than decrease, in value over time. Pursuing sustainable development required; socially sustainable, economic sustainable, physically sustainable, cannot be done in isolation. Where does it come from?

- High quality urban design.
- Sustainable architecture and planning.
- Safe walkable transport-served neighborhood design.
- Social mix through a wide range of housing types, tenures and prices.
- Value adding to subsidies low income housing.

6. CONCLUSION

The paper is hypothesized that the current urban form in the new Egyptian cities would make them less sustainable in terms of environmental and social aspects. In order to test this claim, a review of some present facts and features with the theoretical principles present a rational explanation of the sustainability of these cities.

A focuses group was also conducted with the Egyptian professionals to provide a general assessment of the current pattern in the new Egyptian cities and define the process that could enhance their sustainability.

The non-efficient development standards produced for these cities and alternation of the planning process affect the coherence of the urban form. Obviously, neither the physical nor the social or environmental principles have been recognized in building these cities (Focus Group, 2009). Therefore, social and spatial exclusions, high commuting, high energy consumption, traffic congestion on the regional road linking with Cairo.

6.1 GENERAL FINDING AND OUTCOMES

That is why most Egyptian professionals support intensification of the new cities, nearly all the professionals agree with infill mixed use or with building the new development with higher density. Mixed use intensification can be controlled by allocating when and where the mixed use should take place. Finally, for the new development, this involved setting out a list of reasonable standards which emerged from the coherency of the traditional form. These standards should support compaction, particularly in the local levels (Beard, 1985). Building the new communities should do on a high density and mixed use concept and through infill mixed use for the existing development. Yet more research and tests are required to define the outcomes of increasing conventional density on the quality of life of the built environment. The contribution to walking/cycling behavior of attitudes and values regarding physical activities needs to be investigated, as to do methodological design strategies that control for these variables.

This study draws lessons from recent subdivision street pattern designs and from street patterns of historic cities. It examines how they function, how they fulfill residents' needs and expectations, and how they accommodate environmental concerns. In developing an alternative pattern that integrates the most important and desirable attributes of each approach, the study concludes: first, that it is possible to maintain the efficiency and quality of the conventional suburb while adopting the geometry of the grid; and second, that it is feasible and desirable to combine the tradition of the main street and the convenience of the commercial strip in a zone of mixed land uses that both relies on and supports transportation. By fusing the street patterns of conventional suburbs with those of the traditional girded city, and by recasting the arterial street in the light of its activity generation potential, it is possible to create communities that are efficient, viable, livable, healthy and highly marketable.

6.2 RECOMMENDATIONS

"Simply put, we wish to improve our cities with design, plain old good design. We also believe that the physical structure of our environment can be managed and that controlling it is the key to solving numerous problems confronting government today- traffic congestion, pollution, financial depletion, social isolation, and, yes, even crime. We believe that design can solve a host of problems and that the design of the physical environment does influence behavior."

REFERENCES

- Acioly, C. (2000), Can Urban Management Deliver the Sustainable City? Guided Densification in Brazil Versus informal Compactness in Egypt, in J.M&B.R, compact City, E&F, Spon, and London.
- Barada , A .(1992) .Distribution Types of Commercial uses in the New Cities Evaluations , Faculty of Urban and Regional Planning , Cairo.
- Burton, E, (2000). The Compact city: Just or Just Compact? A preliminary analysis; Urban Studies, vol.37, no.11, pp.1969-2001.
- Elsadik, M.T (1992). Land Use Structure in New Cities between Theoretical Concept and executive reality, New Cities evaluation. vol.2, Faculty if Urban and Regional Planning, Cairo.
- El-Zamly, H, A. (1994)., Arid Zones : A New Trend in Planning Education, 2nd international symposium ,Planning Education in the 21st century, Cairo University, Egypt.
- Gabr, A., (1990), A Landscape Brief for Egyptian Cities , Research and Technology Academy , Cairo, Egypt
- Kitamura& R Mokhtarian PL, Laidet L; A micro – Analysis of land use and travel in five neighborhoods in the San Francisco Bay area. Transportation, 1997, 24:125-158
- Ibrahim, A, (2008) .Using of Compact Urban Form for the Sustainability of the new Settlements in developing countries. 48th Congress of European Regional science Association, Liverpool..
- Kuppinger& Collage. (2004). Exclusive Greenery: new gated communities in Cairo City& Society, vol.16, no2,pp 35-62.
- Landman, K.(2000), Gated communities and urban sustainability; taking a closer look at the future, 2nd Southern Africa Conference on Sustainable Development in the Built Environment, Pretoria, South Africa.
- M, Bayomi. (2009), The Tale of the Unsettled New Cairo City –Egypt ; A Review for the Implications of the Adopted Privatization and Laissez- Fair Policies on Excluding the Poor form its Housing Market, Young Academic Network Vienna.

- Nippon Koei Co& International ,(2006), the Master Strategic Plan of 6th of October and El sheikh Zayed New Cities Jointly in one Unit Cairo.
- NUCA, (2008),The Strategic Planning of 6th October and El-Sheikh Zayed a One Planning Unit,vol, 2 New Urban Communities Authority, Cairo, Egypt.
- NUCA, (2009). New Cities: Shining Remarks on Egyptian Map. New Urban Communities Authority, Cairo, Egypt.
- Prince's Foundation. (2007),Learning from Suburbia: Residential Street Pattern Design, Prince's Foundation for Built Environment, An overview of the report, "Valuing Sustainable Urbanism", London, UK.2007
- Report, CMHC. (2007). Canada Mortgage and Housing Corporation
- (Newman& Ken worthy. (1991),Transport and urban form in thirty- two of the world's principles cities. Transport Reviews, 1991, 11; 249-272.
- Remali, (1985), New Towns Policy in Hegab Paper, the Expanding Metropolis: Coping with the Urban Growth of Cairo, Concept Media, Singapore..
- Shourbagy, M (2009). The Evaluation of road and transportation network in the new settlements. International Conference on Developing the New Communities Policies and Priorities, Bibliotheca Alexandrina. Egypt.
- Salem, R, G, A, (2007), the Development of Planning Processes in Egypt. Cairo University, Egypt.;
- Shalaby, a, F (2003). Transfer of Ideas through Planning Education in Egypt: The Case of the Spatial Form of Low Income Housing Cardiff University, Cardiff.
- Spielberg, Frank. (1989), The Traditional Neighborhood Development How Will Traffic Engineers Respond? ITE Journal. September.
- Stewart, D, j, (1999). Cities in the desert: The Egyptian New Towns Program ; Annals of the association of American Geographers, vol, 86,no,3,pp,459-422..
- Yousry , a. M, (2009), The Privatization of Urban Development in Cairo: Lessons Learned from the Development Experience of Al Rehab Gated Community ,International Conference on Developing the New Urban Communities Policies and Priorities, Alexandria, Egypt.

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APPROACH FOR SUSTAINABLE RURAL DEVELOPMENT THROUGH USING GREEN ARCHITECTURE CRITERIA: CASE STUDY OF MENOFIA GOVERNORATE-EGYPT

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ABSTRACT

In an era of rapid growth and unprecedented urban agglomerations in modern Egypt, rural area suffer from the demise of its architectural landmarks and the loss of urban identity under the impact of transforming consumer society. Research is needed to study the mechanisms and frameworks necessary to allow the development of areas of traditional cultures in local rural communities while accommodating urban needs. We believe this can be accomplished through using Green Architecture criteria, and by searching for roots of the original models of modernization and development, and by drawing up operations that permit cultural continuity in rural communities. We conclude that in order to achieve the theoretical foundations for the sustainable development of societies with traditional cultures we need to find collective solutions that can be adapted to fit each local site and its unique environmental and urban identity, The research aim is to highlight the need for a new architecture for rural areas in Egypt, and to develop a vision for the application of ideas, environmental policies and methods to deal with the rural environments that rely on sustainable energy, resource management, and recycling.

Key Words: Rural Development, Sustainability, Green Architecture, Urban Design, Public Participation.

INTRODUCTION

This paper will focus on the urban and architecture situation and changes taking place in Egyptian villages and its impact for the life quality of its habitants, also the new approaches in dealing with rural villages. The village of Kafr Abdou and Kafr Wahb, located N-W of Cairo is used as a case study to illustrate the public participation through using the essential issues of Green Architecture in some Egyptian villages.

As it is no longer necessary to emphasize, the world is rapidly changing, and global development is bringing forth new trends that have a crucial impact on the rural world, on the fundamental aspirations of all societies, excepting only those whose economies have been completely marginalized. According to the World Bank and UN statistics, more than eighty countries have lower per capita income than they had a decade ago. Though much of the world has urbanized, the majority of the world's poor continue to live in rural areas, while 47% of the population in the developing countries still depend mainly on agriculture to survive (Marino, 2001).

- a) This paper attempts to raise questions of theoretical implications
- b) How could we have new concepts to deal with rural area?
- c) What is the local experience in developing villages?
- d) What is the role of Public participation in developing Rural Context?

Traditional village, sprawling, dirty, and overcrowded to such an extent that the outside observer sees little more than chaos, are often delicate and sensitive expressions of social organization. However bad the physical housing itself may be, the villager derives some comfort and, indeed, some meaning from its pattern (Mahmoud Ouda and AlSayed AlHussainy, 1997).



Fig 1 The Traditional village
<http://www.delcampe.net/>

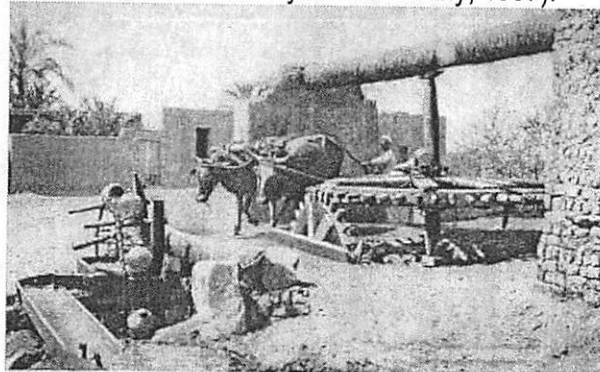


Fig 2 The Traditional village
<http://www.delcampe.net/>

The village is the oldest form of human settlement in Egypt's history. It's the basic unit that adheres to a social system which contains its customs, traditions, and institutions that are inherited from ancient times. Unlike the built environment in urban settlements, where the factory requires a larger area to house workers, agricultural land requires a much smaller area to house the peasants and their families. The form of the traditional Egyptian village was tightly linked to the surrounding economic and political circumstances. For thousands of years, the Egyptian villager was denied the right of ownership of his agricultural land. Land ownership was designated for the governors during the Pharaonic, Ptolemaic and Roman historical periods. This situation continued throughout the periods of Mamluk and Ottoman rule and up until the period of Muhammad Ali (1805-1848) and his agricultural revolution. Throughout history, the land, and not the house, was the center of life and socio-cultural interactions in the Egyptian village (Mahgoub, 2000).

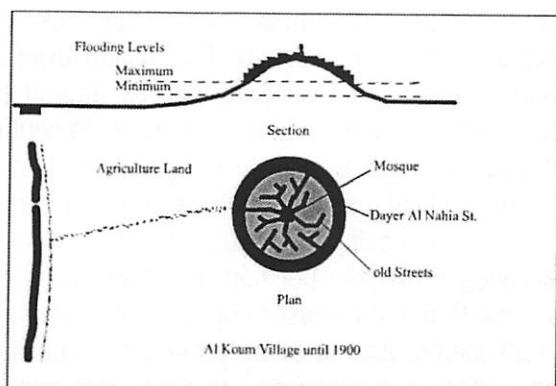


Fig 3 The traditional Egyptian village until 1900 AD
 (Yasser Mahgoub, 2000)

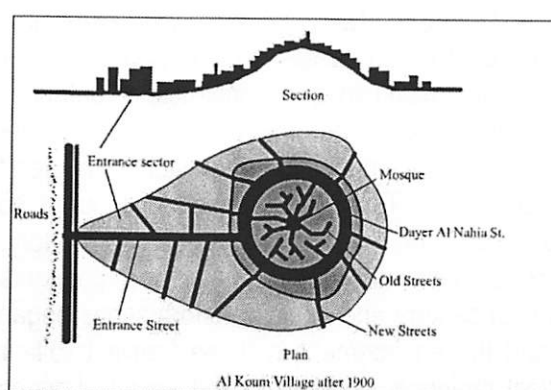


Fig 4 The development of Al Koum village during the 20th century
 (Yasser Mahgoub, 2000)

The ownership of the agricultural land in Egypt remained in the hands of the ruler of the country. He was to assign and distribute it to those who could cultivate it. This situation remained until the beginning of the nineteenth century when drastic changes took place in the ownership of the arable lands (Shalabi, 1983).

At the beginning of the nineteenth century, most of the population of Egypt lived in the countryside while less than one tenth of the population lived in urban areas. The number of villages reached 2325 before the general development plans of Muhammad Ali and his nineteenth century successors. The construction of asphalt roads had a great impact on the development of the Egyptian

villages; old and new villages alike, it caused the creation of new villages and the growth of the old ones (Muselhi, 1990).

Efforts to control the Nile, which Muhammad Ali started during his rule also had a great impact on the morphology of the Egyptian village in the course of the nineteenth century. The irrigation system entered a new phase after constructing a number of irrigation dams such as Al-Kanatir al-Khairiyah, water streams such as al-tawfiki, al-bahairi and al-minofi and drifts such as al-Tiraa al-Ibrahimiyyah in Upper Egypt. After the construction of the Aswan dam in 1902 and its heightening in 1911 and 1933 and the construction of the new High Dam in 1970, Egyptian agriculture was completely transformed from seasonal to permanent irrigation system.

The new irrigation projects protected villages from the yearly flooding, and allowed farmers to leave their hillside homes and construct new houses on the flat agricultural land. we can find that the villages which were on the path of the railroads grew faster than those away from the railroads even though they were more recent (Yasser Mahgoub, 2000).



Fig 5 The Existing Situation of the Rural Context
By the Authors



Fig 6 Visual Pollution at the Rural Village
By the Authors

During the twentieth century, villages started to expand on adjacent agricultural land, resulting in the construction of many more houses for the rapidly growing population. The village dwellers imitated the planning and construction methods found in informal housing expansions around the capital city of Cairo and other major cities. Also, the political transformation at the middle of the century produced social, economic, and cultural changes that influenced the distribution of agricultural land in the countryside. The 1952 revolution distributed the agricultural land among the fellaheen allowing them to own land for the first time in Egypt's history. The large agricultural estates owned by wealthy individuals were distributed among poor peasants allocating 5 faddans per peasant. Also during the twentieth century enormous transformations began to occur that had a drastic impact on the quality of life and the environment in these fragile traditional settlements: among them, population explosion, political changes, economic and social changes, as well as migrations due to wars, and cultural changes (Yasser Mahgoub, 2000). To summarize, the following major problems may be found in contemporary Egyptian villages:

- a) Overpopulation;
- b) Pollution of water sources by house wastes and garbage;
- c) Absence of sanitary, sewerage and fresh water supply networks;
- d) Absence of adequate garbage collection systems;
- e) Visual pollution resulting from absence of planning and harmony;
- f) Cramped and inadequately ventilated or lit houses and streets.

The existing situation forcing new trends to deal with rural villages through a new visions.

Green architecture is one of these approaches to have sustainable development in our rural development, The terms "Sustainable", and "Green" are usually used excessively to describe environmentally responsive architecture, but at a deeper level, each term is also connected to social and political implications. (Steels, 2007)

Sustainability

The meanings of sustainability is meeting the needs of today considered the necessity of preserving the earth for future generations to create sustainable planet to bond civilization. It may be characterized as a compromise between "growth" and "no-growth" factions of the environmental movement of the late 1960s and early 1970s. This term was first introduced in 1970s and since then there has been a considerable number of commissions, legislations and international agreements dealing with the issue of sustainability. The 1992 Rio Earth Summit perhaps the most important convention yet in which the definition of sustainability was refined, and outlined a program for change which encouraged efficient use of the earth's resources and traditional forms of building. (Steels, 2005)

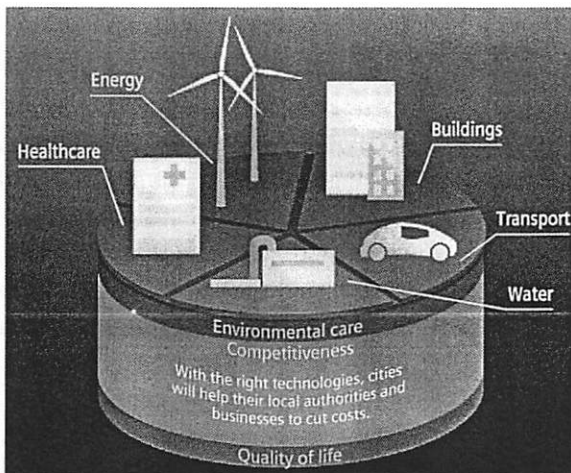


Fig 7 Making up a Sustainable City

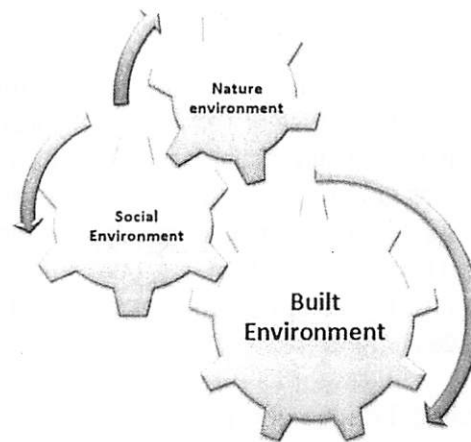


Fig 8 Sustainability
By the Authors by Rio

The Green Movement

Characterized as "a radicalized variant of the ecological sensibility, environmental conservation and adoption of matter cycling instead of matter consumption", the Green movement began to emerge in the mid-1980s. In the United Kingdom, the Green Party is described as the strongest organized hesitation before socialism. In 1990, the commission of the European communities released a "Green Paper on the Urban Environment" that makes an important connection between the ecological and green directions in architecture. Earlier definitions have now evolved into more comprehensive term which is called Ecological Architecture. It merges the interests of sustainability, environmental consciousness, green, natural and organic approaches in an effort to design solutions based on the requirements and characteristics of the site, its neighborhood context and the local micro-climate and topology.

The reflection of Ecological issue on architecture

The 1992 Rio Earth Summit, in which more than one hundred world leaders participated, has provided a comprehensive outline of the possible scope of sustainable development. Of all the forty sections, the fourth area under management of human settlements, is of most interest to architects and urban planners, the most important recommendations were:

- 1- The use of local materials;
- 2- Incentives to promote the continuation of traditional techniques with regional resources and self-help

strategies.

- 3- Regulation of energy-efficient design principles;
- 4- The use of labor-intensive rather than energy-intensive construction techniques;
- 5- The restructuring of credit institutions to allow the poor to buy building materials and services, or the proliferation of micro-credit;
- 6- Exploration of methods to encourage and facilitate the recycling and reuse of building materials, especially those requiring intensive energy consumption in their manufacture;
- 7- The use of "clean technologies".

These criteria has been adopted by many architects from the beginning of the 20 th century, Hassan Fathy was one of the first to recognize and speak out against, what he considered to be the aesthetic anonymity of international style modernism. The began to conduct extensive research into vernacular prototypes to discover the reasons for their climatic effectiveness in the absence of a mechanical system. Hassan Fathy is best known for his widely read "Architecture for poor", but he actually completed more than fifty projects with what he referred to as "appropriate technology".(Jencks, 2006)

The Leadership in Energy and Environmental Design LEED is an internationally recognized certification system that encourage global adoption of sustainable green building through implementation of universally accepted benchmark for the design. This benchmark includes metrics that matter most to our environment such as energy savings, water efficiency, co2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. The LEED works throughout the building lifecycle from design to construction then operation and maintenance providing a framework for identifying and implementing practical and measurable green building design.

The essential issues of green Architecture

- 1- Energy efficiency and renewable energy.
- 2- Direct and indirect environmental effects.
- 3- Rationalization of resources and recycling.
- 4- Indoor environmental quality.
- 5- Community issues.

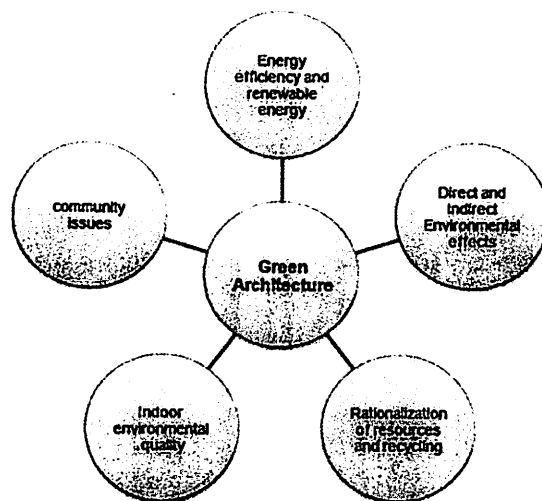


Fig 9 Green Architecture issues

Case Study of Kafr Abdou and Kafr Wahb Village

Kafr Abdou and Kafr Wahb are one of the 19th century Villages in Menofia governorate. Where it found after the Mohamed Ali Basha's new visions to the villagers who works in agriculture. The village have passed with rapid growth during the 20th century, but it still have a conserved historic fabric, as evidenced by the historic Blessed Virgin Mary church, which dates from 1858. Today it remains one of the important aspects in the village as many pilgrims visit it.

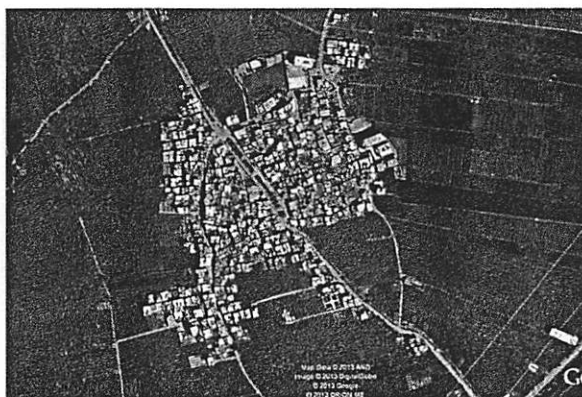


Fig 10 The location of the Village
Google Map

The analysis that follows draws from site visits and interviews with local residents conducted during the summer of 2013., I should point out that archival documentation is lacking.

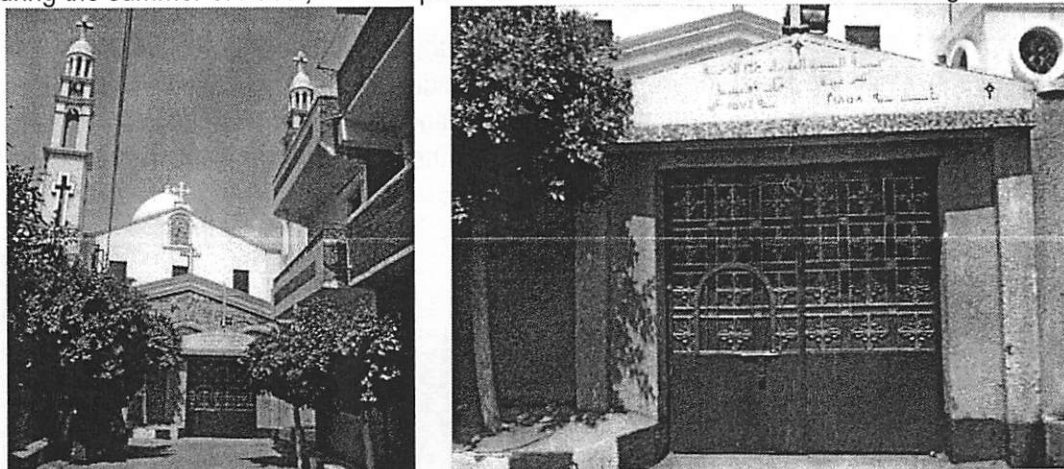


Fig 11 Church of the Virgin Mary

During the period 1960-1980 the village suffered from the usual problems afflicting most villages in the Egyptian Delta that resulted from important and significant changes taking place throughout the countryside. The environment of the village was polluted both physically and visually. . The absence of a systematic garbage collection system forced villagers to dump their house wastes in water canals and ditches. This produced a polluted environment both physically and visually. The phenomenon stems from social and economic causes, and it cannot be understood unless analyzed historically and environmentally. An uninformed first impression might suggest that traditional settlements were primitive, unplanned, and intrinsically dirty and muddy. The rising water level, due to the high level of water in the canals, produced another problem for village houses, namely a threat to their mud brick construction.

Pollution of Egyptian rural settlements environment is increasing on many levels. Piles of garbage and house waste are filling ditches and water canals. Dead animals are found floating on the surface of water canals. The absence of a sewerage system collection and dependency on trenches for the treatment of human waste poses a serious health hazard for the villagers. The first effort of the government is usually directed to solving this problem but the size of the problem is overwhelming. The air is polluted with the exhaust of nearby factories and the burning of house and farm waste. These types of environmental pollution also create a visually polluted image of the village.

COMMUNITY DEVELOPMENT

Villagers started to explore other options to enhance their town by beginning to plant trees in 1985, adapting a green approach for development. First, they established a Local Development Association. Dr. Magdy Abd-el Maksoud and Eng. Fathy Abd-el-Mohsen, are two pioneers in the village and they encouraged the villagers to use a four-part Green Architecture approach to development.

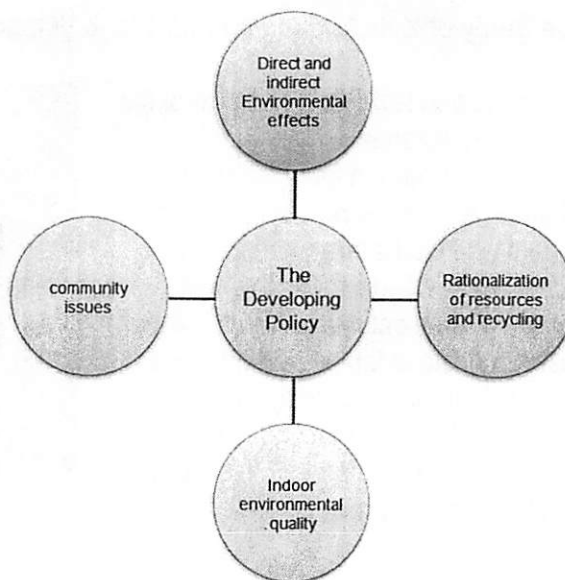


Fig 12 The Development Policy

The Direct and Indirect Environmental effects

According to what have done in the Village, Eng Fathy said they depends on greening every space in the Village, covering the sewerage system and bounding by trees and roses. This infact have an effect for reducing the sewerage pollution to the village and have landscape suitable to the main goal. All of this come as a result of the personal efforts of the inhabitants, the planting process has continued, turning the village into a green and delightful place.



Fig 13 The Green all over the village



Fig 14 The caring center in the village

Rationalization of resources and recycling

The village suffered from garbage and house waste so they thought that one way to alleviate the problem was to hire employees to clear the streets three times a week. This was financed by a monthly levy of LE3 (0.5 \$) on each household. The waste was sent to the town's garbage dump. The money collected through the levy paid the salaries of the employees and also the tractor's maintenance. Also they decided to stop using air conditioning in the mosque this summer due to the energy crisis.



Fig 15 Small water-purification plant Building.

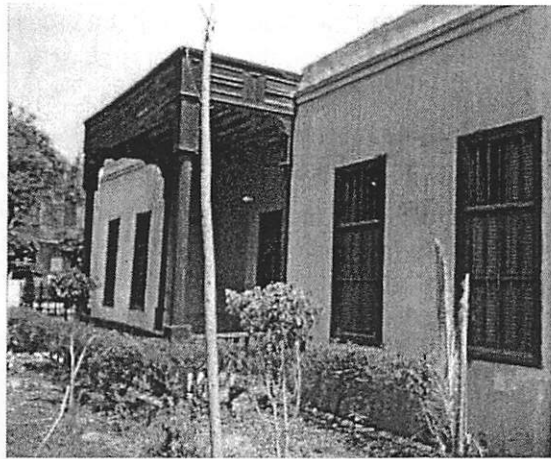


Fig 16 Restoring and conserving the Historic Building.

Other important issue for the village was the availability of clean water and the need to reduce water consumption. This problem was also solved through local community action by establishing a small water-purification plant from which villagers could access clean water. By forcing the villagers to get clean water from this unit, water consumption rates were also reduced. Clean water has an enormous impact on the villagers' health. As it turned out, the cleaning water unit was a donation from one of the village's residents. Also the villagers have opted to use "gray" (i.e. used) water for cleaning the streets.

Other Community issues

One common problem is access to subsidized bread. Hassan said that before the village's own bakery was established, people used to go outside the village and stand in long queues to get bread. Sometimes they were lucky to get some, but just as often they failed.

For this reason, the Local Development Association decided to build a bakery in the village to put an end to the problems people had in getting this staple. In 2005, the bakery was established by donations from residents and the Association took out a bank loan to purchase machinery. The Association's role did not end at establishing a bakery, however, since it also adopted a distribution system for the bread to ensure that all families had access to it. More impressive still is the fact that the Association had a database of the 4,000 individuals living in Kafr Wahb, which greatly facilitated the distribution process.

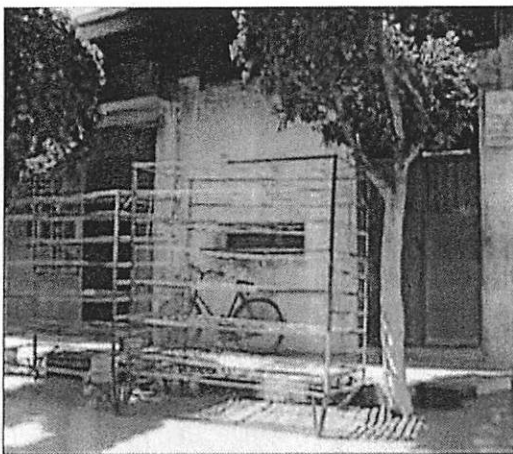


Fig 17 The Bakery in the Village Building



Fig 18 The Association Building

Another problem which they success in ending the butane gas cylinder problem the village has

faced. Like for other subsidized petroleum products in Egypt, the distribution process for gas cylinders is often inefficient, paving the way for a black market that sells cylinders at triple their real price, Since there was no gas cylinder depot in the village, the association had asked the government to deliver gas cylinders to the village once or twice a week. The association worked on collecting the empty canisters from the houses and replaced them with new ones, all in return for a LE1 subscription from each household. The three-floor Association building hosts many activities. On the ground floor, there is a nursery for children. On the second and third floors, there is a women's club where women work to make different kinds of baked products and a room dedicated to sewing activities.

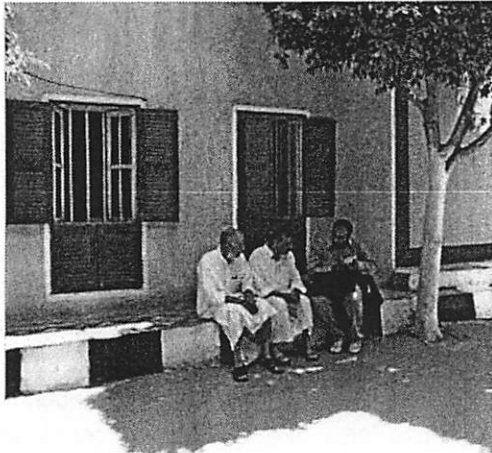


Fig 19 During the Site Visit Survey



Fig 20 The Urban Landscape in the Village

Indoor environmental quality



Fig 21 Decorated Tress

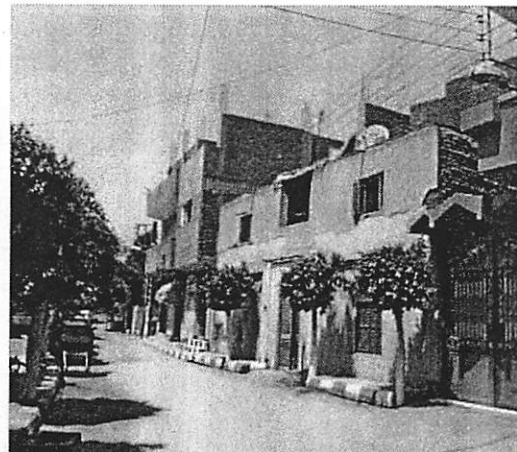


Fig 22 New and Old houses

It is remarkable that through the great efforts of its residents, the village has been made unequivocally charming – indeed, an almost perfect location for amateur painters. Everything is perfectly drawn, the houses are carefully built and their doors decorated with beautiful ironwork. Paved roadways are bounded by trees and roses, one of them even being decorated with a string of arches made out of trees. Green literally prevails, and even the buildings' façades painted green. "Green sends peace to the soul, so we thought we would paint the buildings green to match the natural green of the trees. These multiple efforts help restrict the proliferation of microbes and bacteria, and thus reduce the rate of disease and epidemics, as well as indoor pollution.

The case study will apply the LEED's regulation and criteria to measure how far this village is sustainable by recognizing performance in nine key areas, namely human and environmental health

such as sustainable site development, water saving efficiency, energy efficiency, material selection, indoor environmental quality, location and linkages, awareness and education, and, finally, innovation in design and regional priority.

1. Sustainable Site Development:

The Kafr Abdou and Kafr Wahb village was based on redeveloping the existing village property. The village takes maximum advantage of site encourage regionally appropriate landscaping.



Fig 23 Entrance of the Village.

2. Water Saving Efficiency:

The village encourages the smart of use of water, through the unit they did to supply all the Village with the pure water, Also using gray waste water produces in landscaping of plants used in the village.

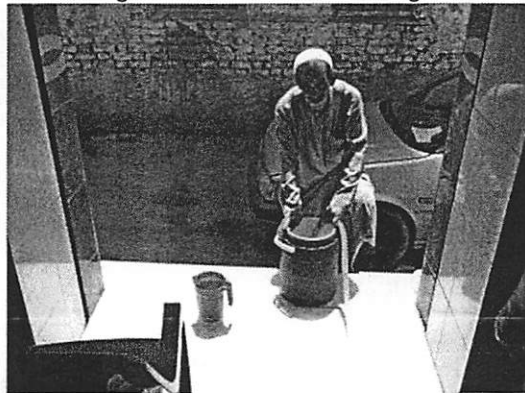


Fig 24 Water Saving.

3. Energy Efficiency:

The village takes into consideration the need to reduce the consumption of energy, especially in public spaces such as the mosque and the church. They are also trying to apply solar and renewable energy sources to the village, and have discussed shading the roof with green plants in order to reduce the amount of the sunlight, especially during the hot summer months.

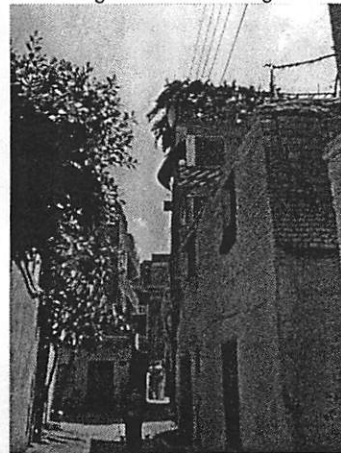
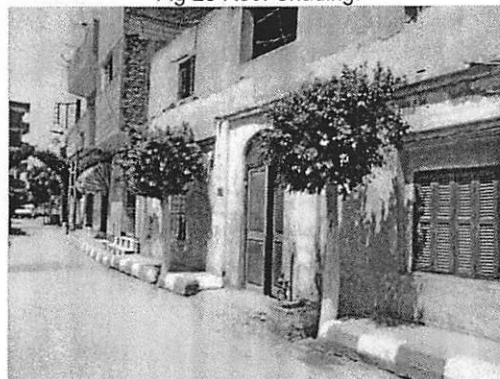


Fig 25 Roof Shading.

4. Material Selection:

The village encourage the selection of sustainable and traditional material, Specially reuse and preservation of the old and historic building, and reuse the old bricks and wood blanks in the new construction, but still doesn't have any pilot project for this issue.



5. Indoor Environmental Quality:

All building have access to natural daylight, and the villages mostly depends on natural ventilation.

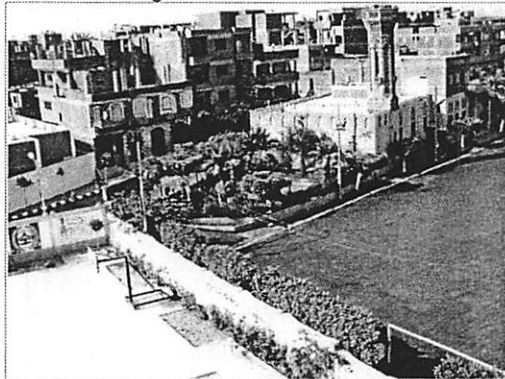
Fig 26 Conservation of the Old Building.



6. Locations & Linkages:

The village is located in in Menoufiya governorate called Kafr Wahb, 1 kms west the rural road, it encourages access to open space for walking, physical activity and time spent outdoors.

Fig 27 Nature Ventilation.



7. Awareness & Education:

The awareness and education of what makes the village green, the village can spread the culture of sustainability in the surrounding communities.

Fig 28 Youth Center.



Fig 29 The Village School.

8. Innovation in Design:

The ability of the villagers of Kafr Wahb to overcome problems faced by similar villages all over the country is the most impressive aspect of my study.. The difference comes in the way the residents have decided to solve them, first by establishing an association for dealing with their problems, and second by their collective participation in carrying the association's ideas.



Fig 30 The Association.

9. Regional Priority:

The village earns a regional priority due to its environmental importance and being as essential visit as a case study specially in rural development.



Fig 31 Cleaning Roads.

Despite the fact that the village had been able to overcome many of problems, it still needs support from the government to solve other problems such as sanitation that requires the intervention of larger institutions that only the government can provide. Also the architecture of the newer buildings in the village would benefit from the application of more innovation methods in line with the green village vision.

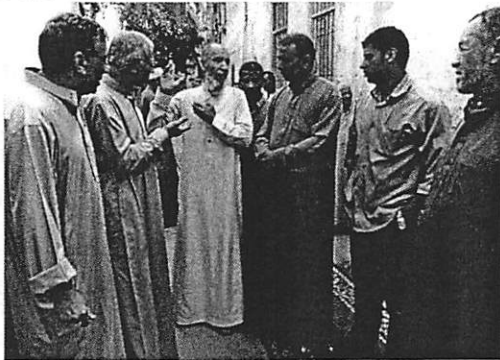


Fig 32 The Villagers Meetings.



Fig 33 Public Participation.

The village's beauty does not only stem from its delightful scenery, but also from the ability of its people to overcome their problems. The problems of Kafr Wahb do not differ from those faced by other villages across Egypt. The difference comes in the way the residents have decided to solve them. Local residents have not waited for the government to solve their problems, but instead have opted to do so themselves, specially activate the role of Public Participation.

THE CONCLUSION AND RECOMMENDATION ARE AS FOLLOWS:

- Increasing evidence of environmental problems led to along series of institutional initiatives, guided by the United Nations, to demand people all over the world to conserve non-renewable to be environmentally responsive.
- The responsive architectural movements to these demands have the term of Sustainable Ecological, Green, Natural, Integrated or Organic Architecture.
- Green Architecture embraces many issues connected with Architecture such as resources equity, global community, socioeconomic issues, using renewable materials instead of scarce resources, understanding the wisdom of traditional or vernacular architecture.
- A new attitude towards technology has been aroused claiming that (high-tech) causeing more problems and we have to use the appropriate technology instead.
- The main principles of Green Architecture have been advocated from the beginning of the twentieth century.
- Digital Ecological architectural will represent the new future of ecological architecture
- The LEED's principles are taking sustainability to new levels, such meaningful gains are needed in this period of rising energy costs and growing environmental concerns. By following the LEED's principles rural communities can achieve their sustainability goals be reducing

electricity consumption used to power interior lighting, lowering cooling costs and improving the health and well-being of local residents.

- It can be concluded that village building development? requires careful design that pursue environmental aspects. Sustainable design strategies will reduce long-term costs and move communities toward environmentally responsible development.
- Conventional villages can be adopted in an ecological way to be environmentally- friendly.
- It is found that the local community benefits when villages employ local workers and use local materials to overcome local unemployment.

REFERENCE:

- Margarita Marino 2001, "A New Vision of the Rural World's Role in a Globalized Environment".
- Yasser Mahgoub 2000, The transformation of traditional rural settlements in Egypt, Culture and Space in the Built Environment Network, Amasya, Turkey.
- Mahmoud Ouda and AISayed AlHussainy, The Village Society in The Developing Countries: Theoretical approaches and field studies (Alexandria: Dar El Maarif Al Gamia, . 1997), p. 194.
- Ali Shalabi, The Egyptian countryside during the second half of the nineteenth century 1847-1891 (Cairo: Dar Al Maarif, 1983), p. 69- د. على شلبى. الريف المصري في النصف الثاني من القرن التاسع- (عشر 1891-1847 . دار المعارف. 1983. ص. 69).
- Yasser Mahgoub 2000. The transformation of traditional rural settlements in Egypt, Culture and Space in the Built Environment Network, Amasya, Turkey, 2000.
- Steel, James 2007, "Architectural Today." Phaidon press limited, London, page 284.
- Steel, James 2005, "Ecological Architecture" a Critical: History (London: Thames and Hudson), page 6.
- Jencks, Charles, 2006, Theories and Manifestoes of Contemporary Architecture", (Wiley-Academy, England).
- Mendler, Sandra William Odell and Mary Ann Lazarus. (2006), The HOK Guidebookto sustainable Design, 2nd ed., (New Jersey: John Wiley & Sons, Inc..).
- Fathy, Hassan.1986, Natural Energy and Vernacular Architecture: principles and Examples with Reference to Hot Arid Climates (Chicago: the University of Chicago Press).
- Fathy M. Muselhi, Between the Problems of Comprehensive Development and Village Planning: Urban Egypt at the beginning of the 21 Century, (Dar El Maarif Al Gamia. Alexandria, 1990), p. 214.

WALKABILITY ASSESSMENT OF THE PEDESTRIAN ENVIRONMENT IN KUALA LUMPUR CITY CENTRE: A MULTI STAGE APPROACH

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ABSTRACT

Kuala Lumpur occupies an average position amongst the most liveable cities in the world defined by the Economic Intelligence Unit's global liveability index 2012. The position seems not convenient to the city authorities. The authorities are trying hard to improve it. Walkability of the built environment is a significant component of the liveability of the city and consequently its sustainability (Lennard, S.C & Lennard, H., 2008). Careful look at Kuala Lumpur today reveals that the city built environment is, in general, not a pedestrian friendly. The main issues related to walkability the built environment of Kuala Lumpur suffers from are clearest in the city centre. This paper presents some findings of a research project initiated by AUCTA (The Centre for Urban Conservation and Tropical Architecture), University of Malaya and supported by UMRG, in 2012, and focused on the city centre of Kuala Lumpur. The project adopted three levels of investigations for walkability assessment in the city centre of Kuala Lumpur: field observation, road survey and users interview. This paper focuses only on the component of the walkability assessment related to safety. The outcome of this paper reveals some critical issues the case study area suffers from. Feeling safe in the area, CCTV surveillances and streetscape come on top of the issues. The outcome also provides a solid base for the next research activities of the project.

Key Words: *Walkability, pedestrian environment, safety, city centre, Kuala Lumpur.*

INTRODUCTION

Kuala Lumpur, the capital city of Malaysia, occupies an average position amongst the most liveable cities in the world defined by the Economic Intelligence Unit's global liveability index 2012. The city is ranked the 79th most liveable city out of 130 cities in the world. In Asia, Kuala Lumpur is the 10th most liveable city out of 31 Asian cities covered by the index. These positions seems not convenient to the city authorities. The authorities are trying hard to improve them. The Government Economic Transformation Programme 123 summarizes the aspiration of the authorities as 20-20 by 2020. The Kuala Lumpur authorities are planning to simultaneously have a place for their city in the top-20 ranking in city economic growth (as defined by city gross domestic product growth rates) and a place in the global top-20 most liveable cities by 2020. Greater Kuala Lumpur is parallelly targeting both growth and liveability. Seeking this high level of liveability requires large scale improvement for various liveability dimensions such as built environment, culture, education and healthcare (Government of Malaysia, n.d.).

Walkability of the built environment is a significant component of the liveability of the city and consequently its sustainability (Lennard, S.C & Lennard, H., 2008). Careful look at Kuala Lumpur today

reveals that the city built environment is not a pedestrian friendly. This fact is supported by a public opinion survey done by Seranta Awam. The main issues related to walkability the built environment of Kuala Lumpur suffers from are a result of inefficient design, poor walking pavements and poor respect to pedestrians in terms of traffic planning and spatial distribution (Japheth, Lim, 2012). These issues have been clearest in Kuala Lumpur city centre. In the process of Kuala Lumpur development, the city centre has attracted, due to its location advantages, various types of economic activities. The competition for the scarce land in the centre between those activities and existing activities was in favour of the former. They gradually replace the existing activities in general and housing one in particular. Consequently, the old buildings deteriorated and the new buildings were usually high rise. Further, large parts of the existing road network which were developed long back could not be improved. Despite this, the car has been given higher priority. The pedestrians need to struggle while moving from one place to place. This was one more contribution to the deterioration of the city centre environment (Said. M. H, 2011; Shuhana Shamsuddin, Nur Rasyiqah Abu Hassanb & Siti Fatimah Ilani Bilyamin, 2012).

In the light of all above, AUCTA, The Centre for Urban Conservation and Tropical Architecture at the Faculty of Built Environment, University of Malaya, supported by UMRG programme grant, has initiated the three years research programme: Urban transformation: emerging towards liveable city. The programme encompasses three sub-programmes: affordable green house, urban conservation and sustainable mobility of Kuala Lumpur city centre. The components of this paper are a part of the third sub-programme activities.

BACKGROUND

Walkability is a term used to describe the physical environment where walking takes place. Walkability is not as same as walking. It refers to the space which is created by the street, streetscape and buildings while walking refers to the form of physical activity (Theresa, A., Glanz, 2011). Walking is considered as a minor mode of travel (Litman, T., 2010). Physical activities are beneficial to human health. They can protect from major causes of diseases. Regular and abundant walking can produce several types of benefits to the human body such as weight management, reduction of osteoporosis, diabetes, anxiety and colon cancer (Goodman and Tolley, 2003).

When the pedestrian environment is walking friendly, it can be described as a walkable environment. Edmonyon Llewelyn-Davies (2000) cited in Shamsuddin et al (2004) cited in Shuhana Shamsuddin, Nur Rasyiqah Abu Hassan & Siti Fatimah Ilani Bilyamin (2012), defines the walkability of a pedestrian environment by the level of pedestrians' comfort and safety. The major elements that contribute to the walkable environment according to Edmonton T. C. (2008) are: mix land use, density, pedestrian network, destinations and access to public transit systems.

Improving the pedestrian environment in the city has several positive impacts such as reducing the dependency on private cars, road congestion and air pollution (Stephen, 2004). The impacts on the city centre are even greater. In the centre, extensive and varied activities exist and pedestrian movement are greater as the distances are usually not long. Enhancing the walkability of the city centre helps the pedestrians to reach their destinations easily and makes them enjoy the journeys (Tolley, 1990). The walking experience in city centres according to (Gehl, J, Gemzoe, L, Kirknas, S, Sondergaard, B., S., 2006) should be safe, comfortable, and enjoyable.

Today, there exist a wide range of methods (qualitative and quantitative) to assess the walkability of the pedestrian environment. Those methods include "audits, tools, scales, instruments, checklists, inventories, levels of service, survey questionnaires, and indices" (Praveen K. Maghelal and Cara Jean Capp, 2011, p. 6.) and more recently, mobile methods in which pedestrians are involved to be in direct interaction with the environment and the researcher during the survey. Pedestrian environment assessment methods in general focus on the micro scale and try to understand more about how pedestrians interact with the features of the pedestrian environment around them during

their walking trips and to define the set of physical features of the environment that are important for the pedestrian to go for walking (C.E. Kelly, M.R. Tight, F.C. Hodgson, M.W. Page, 2011). Their components cover long list of measures related to various features of the pedestrian environment such as connectivity, pedestrian safety, streetscape, road design, pedestrian sidewalk design and others. However, Clifton et al. (2007) cited in Praveen K. Maghelal and Cara Jean Capp (2011, p. 6.) reported that "In sum, the important factors contributing to 'walkability' are still very much in contention Among the complications is the nature of the measures: some aspects of the pedestrian environment can be measured objectively, and therefore with more ease, but others are more subjective in nature."

Walkability is a significant component of the city liveability which contributes to building sustainable environment and making a liveable place (Shuhana Shamsuddin, Nur Rasyiqah Abu Hassanb & Siti Fatimah Ilani Bilyamin, 2012). To reach liveability, the city needs to put emphasis on sustainability of transportation. Sustainable transportation aims at reducing noise and air pollution as well as encouraging residents to walk (Lennard, 2008). According to the Structure Plan of Kuala Lumpur 2020, the vision for the city is to become a 'World Class city'. It can be achieved by providing quality of life for people through priority to safety and comfort which is oriented to the people's needs such as walkable city and liveability of the community. The Kuala Lumpur City Hall has addressed the concept of walkability in order to improve the working environment and quality of life in the city centre through integrated transportation system (Shuhana Shamsuddin, Nur Rasyiqah Abu Hassanb & Siti Fatimah Ilani Bilyamin, 2012).

Pedestrian environment improvement became more active in Kuala Lumpur city centre in the second half of the 1990s with the preparation for the commonwealth games. The meeting with the DBKL, at the Faculty of Built Environment, University of Malaya, March 2013, revealed that the environmental improvement in the city centre started with upgrading some walkways. Bukit Bintang, the focus of this paper was one of the early roads improved. The quality of improvement improved tremendously in the following years with the gradual introduction of terms such as barrier free and safe city. The two sets of walkways the first of which is linking Berjaya Times Square to Pavilion and the second pair is linking Jalan Perak and Pavilion with Crowne Plaza and Jalan P. Ramlee, and linking Jalan Sultan Ismail with Jalan Pinang are some examples. In addition, a long-term plan is being developed by DBKL to develop full pedestrian network across KL city totalling 45 kilometres. Further, under NKRA private sector such as PETRONAS has joined the public sector in pedestrian improvement. 4.5 kilometres of covered and elevated pedestrian linkages in the city centre have been completed jointly by public and private sector. (Japheth, Lim, 2012).

AIM, METHODOLOGY AND SCOPE

The aim of the research project from which this paper is extracted, is to define the main issues related to walkability of the first and last mile of the public transport in the city of Kuala Lumpur. The approach adopted by the project is to bring together the stakeholders concerned with first and last mile of the public transport to a series of workshops to discuss the present and future role of each stakeholder. The first workshop is preliminarily scheduled in September, 2013. In order to cover a wide range of parameters related to walkability assessment, the project adopted three levels of investigation: road observation, survey questionnaire directed to the users and interview with the sidewalk users. Based on extensive review of relevant literature, the set of parameters was designed to cover a wide range of physical features of the pedestrian environment. Some of the parameters covered by the road observation, another group of the parameters were covered by the questionnaire while there is some parameters covered by both. The need to have a comprehensive list of parameters for assessing walkability is pointed at by various researchers such as Kockelman (1997), Frank and Pivo (1994), Kitamura, Mokhtarian, and Laidet (1997), cited in Praveen K. Maghelal and Cara Jean Capp, (201). The road auditing was carried out by specialist persons who have architectural background and trained for this purpose. The respondents to the questionnaires were selected randomly from random places in the

first mile which was in the city centre and in the last mile which was in the outskirts of the city. The outcome was 30 questionnaires for analysis, 20 adult females and 10 adult males. 5 people were interviewed. It was not easy to adopt the mobile method as it was not easy to stop people at the end of the route and interview them particularly those who were going to their work places. Several people did not give the sufficient time for answering the questions. The set of parameters covered features related to walker friendliness, comfort, safety, convenience and connectedness.

This paper presents the safety component of a selected route walkability assessment. Safety has been given the highest priority for motivating walking in Kuala Lumpur city centre in the survey that sought people's opinion to rank a set of criteria for a good walking environment as a part of the research project. Out of 5 as the most important, safety scored an average of 4.78 in 100 responses. Well-maintained sidewalks came second. The road observation covered vehicular road conditions, pedestrian walking conditions and natural surveillance. The questionnaire revolved around safety and accessibility, walkway design, night lighting and CCTV surveillances. The interview covered all the points in the observation and the questionnaire.

Out of various locations covered by the project, this paper will focus on Bukit Bintang. This area constitutes an important destination in the city centre. The route between Bukit Bintang Monorail train station and the pavilion is selected to represent the last mile of a public transport trip (refer Figure 2). The monorail line connects the city centre with Kuala Lumpur Sentral station via which the passenger can travel to various places of Kuala Lumpur by various train lines.

CASE STUDY: BUKIT BINTANG

Bukit Bintang is one of the most popular shopping and entertainment districts of Kuala Lumpur amongst local citizens and international tourists. The area which has been the most prominent retail belt in Kuala Lumpur is the home to many landmark shopping centres, café shops, swanky bars, night markets as well as hawker-type eateries. It has been categorized under the City Centre Commercial Area (CCC) in the key urban areas of the city according to the Draft KL City Plan 2020. It encompasses Jalan (road) Bukit Bintang and its immediate surrounding areas. The area however, is identified, under the GTP as one of the crime hotspots selected under the programme (PEMANDU, 2011). Jalan Bukit Bintang is the main road in the district. It starts at Jalan Raja Chulan and ends at Pudu Road. In addition to Jalan Bukit Bintang, the district is defined by another two intersecting roads. They are Jalan Sulatan Ismaei and Jalan Imbi. The Monorail station which is located at Jalan Sultan Ismail, is always the starting point for the district visitors who are the public transport users (refer figure 2). The place lacks bus stops and public busses are seldom seen around it.

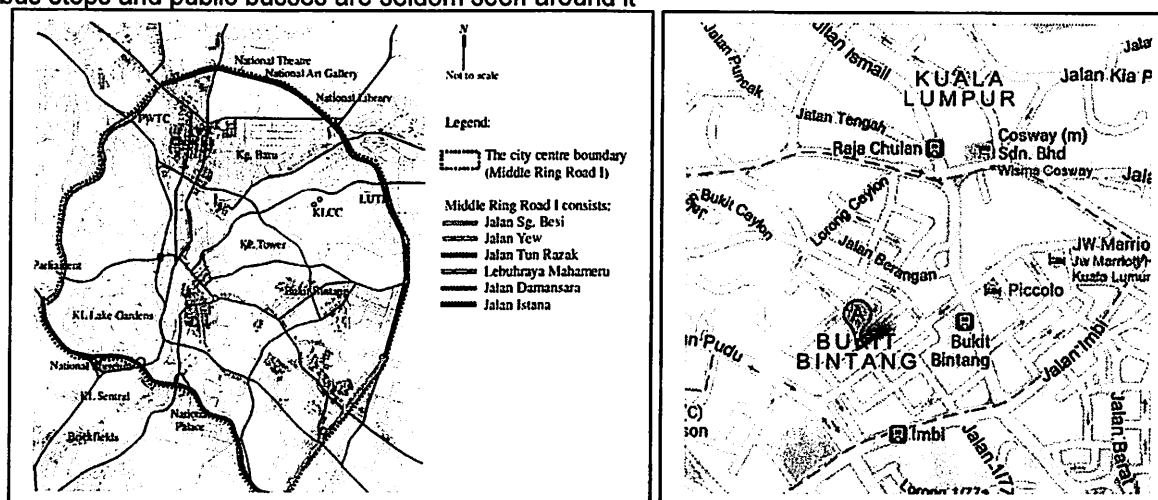


Figure (1): Kuala Lumpur City centre map (Wong, Seng Fatt. 2011) Figure (2): Bukit Bintang map (Google map, 2013)

FINDINGS AND DISCUSSION

1. Field observation (auditing)
 - a. Vehicular road conditions

This parameter covered width of curb to curb roadway, number of through traffic lanes and number of through traffic elements. Jalan Bukit Bintang is a four lanes one way vehicular road equipped with a wide pedestrian walkway in each side. The width of the road is 18 meters (Figure 3). The cars usually run at high speed which could be estimated at 70 kilometers per hour.

When the road is congested, some people cross the road from one side to another in places not allocated for pedestrian crossing. Motorcycles in such cases constitute a threat to the crossing people.

- b. Pedestrian walkway conditions

Width

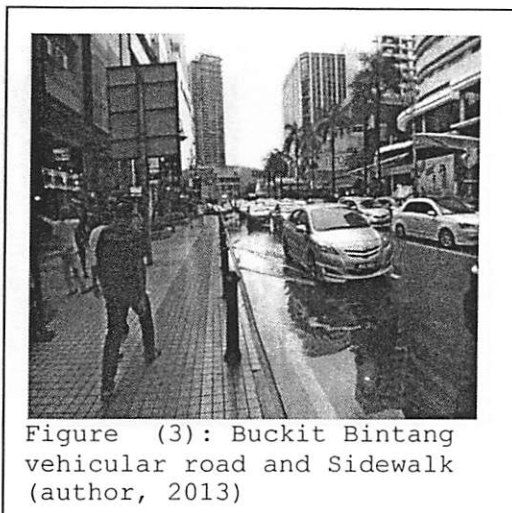
As mentioned earlier, there is a wide pedestrian pavement at each side of the road (Figure 3). The walkways connect the Monorail station with the pavilion shopping centre. The width is not constant. It varies from 3 to 6 meters. This width seems sufficient to accommodate the pedestrian movement even during peak hours.

Materials

Floor coverage materials also vary as they are, in several places, provided by the owners of the adjacent buildings. Several materials could be identified during the observation. Homogenous tiles, pebble and hard marbles are some materials that could be easily seen. Some characteristics of the used materials for the sidewalks may constitute a threat to the safety of the walkers. The tiles are more slippery, unsafe and unfriendly for the user. The black colour of the marble tiles may be unsafe during night time when light is not much, particularly when it involves different levels and steps.

Obstacles

During the observation we could identify several elements which can disturb the smoothness of the pedestrian movement. The main obvious obstacles are the many signage poles and the relatively large sizes planter boxes. The locations of such elements can hinder the movement. Figure (4) shows some obstacles on the sidewalks.



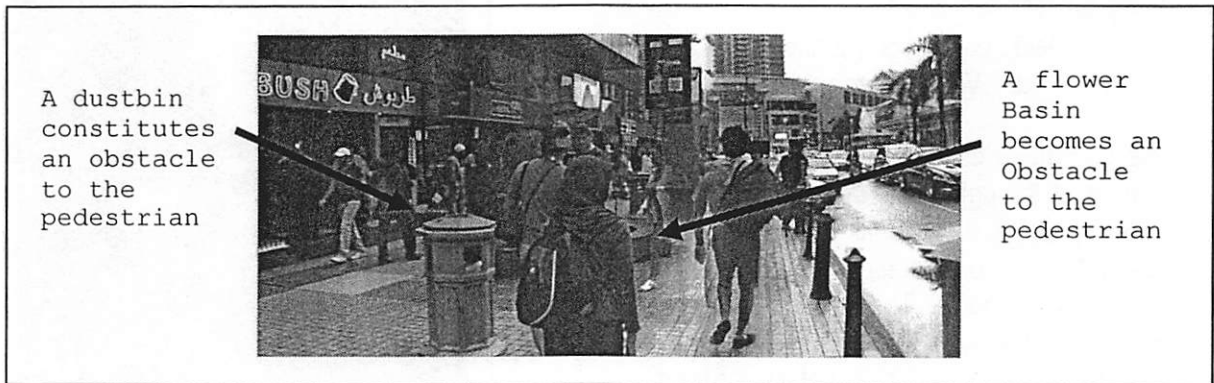


Figure (4): Some obstacles on the sidewalk in Bukit Bintang

Pedestrian crossings

The main pedestrian crossing is located at the intersection of jalan Buckit Bintang and jalan Sultan Ismail. Using this crossing, people can move to the both sides of Buckit Bintang and to the both sides of Jalan Sultan Ismail. This crossing in fact connects the office zone and the commercial zone around the area. The time given to the pedestrian to cross the road is around 20 seconds in each round of traffic lights. This time is sufficient for allowing only small number of people to cross the road. It is estimated that during peak hours, the person might need more than five minutes to cross the road. This disturbs people during rain fall which happens very often in the tropical city of KL. In addition to this point, there is another critical point where the crossing users may be unsafe enough. This is because of the conditions of the buffer zone at the crossing. The zone is located just next to the busy road and consequently, has a direct contact with it. This makes the users to the road vulnerable to snatchers during the time the citizen is waiting for crossing the road (Figure 5).

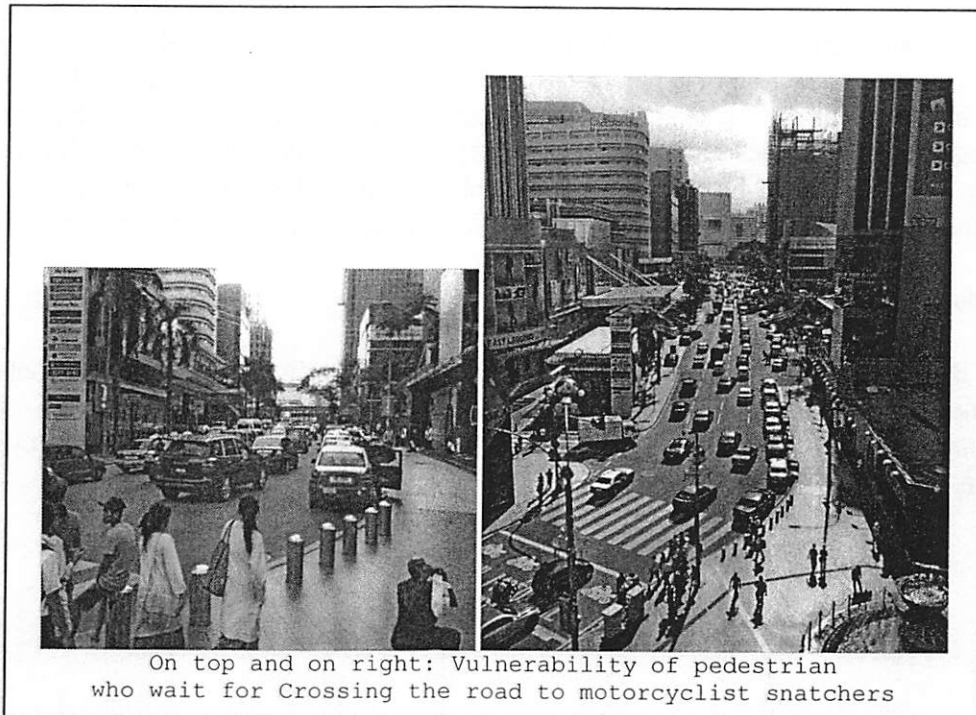


Figure (5): Pedestrian crossing, bucket Bintang (author, 2013)

c. Natural surveillances

This term is used in the models of Crime Prevention through Environmental Design (CPTED). It indicates the organization of the physical features, activities and people of the pedestrian environment that maximizes natural visibility or observation (National Crime Prevention Council, Singapore, 2003). Appropriate arrangement of natural surveillances can be reached through designing and placing the physical features of the road and the activities along it in a way that maximizes visibility and foster social interaction (Norsidah Ujang, Atirah Salim and Suhardi Maulan, 2012). The high visibility at various parts of the road and the active social interaction reduces the feeling of the potential offender of possible and safe escape. This consequently, influences the offender decision to proceed with the criminal action, hence, reducing the crime rate in the area. Field observation reveals high level of natural surveillances. The main activities take place at the ground level, twenty four hours and seven days a week. This makes the road alive around the clock. In addition, four police men are on duty most of the time. All of this encourages the user feel comfortable and safe in the road.

2. Survey questionnaire

a. Safety and accessibility

A good accessibility allows people to enter into the place easily. Under the first indicator which is related to accessibility and safety there were three statements for people to rate. The first one is about the easiness of accessibility to the case study road. As shown in table (1), 2 persons considered the accessibility to the road as not easy, another 2 were neutral, the vast majority, 24 persons agreed that the road is easily accessible from outside, and the rest 2 respondents strongly agreed with the statement. This can be considered as a good indicator on the accessibility of the road. Not much the difference is between the percentage of responses of the males and those of the females who gave positive rate to the questions. 9 males agreed on the statement which constituted 90% of the males' respondents while 17 females gave positive assessment to the statement which constituted 85%.

In rating the second statement which is related to safety while waiting for a bus or a taxi at the bus and taxi stands, ten persons (33%) gave negative rating to the statement, 11 respondents (36.6%) were neutral and 9 (30%) persons agreed with the statement which indicates that the place is safe when waiting at the bus or taxi at the stop. There is some difference between male and female rating. 20% of the male rate the place as unsafe while waiting for a taxi or a bus while 30% of the females gave negative rate. This difference however, is not much significant and may be considered normal as females usually more worried in such places than males.

In rating the third statement which considers the sidewalks as safe while walking from the access point to destination. 6 persons (around 20%) disagreed, 11 persons were neutral while 13 (43%) persons agreed with the statement indicating that the area is safe for them. There is some difference between males and females in rating this statement. 20% of the males were negative in rating this statement while 30% of the females rated this point as negative.

b. Walkway design

Only 23% (6 agreed and 1 strongly agreed) agreed that the pedestrian sidewalks are wide enough for people during busy hours. This indicates that people found the sidewalk as congested during the peak hours. This contradicts with the finding of the sidewalk observation which suggests that the sidewalk is sufficient to accommodate people even during peak hours. Nothing can be done to widen the walkways but the streetscape can be refined to facilitate pedestrians' movement during peak hours. In the other scores, neutral persons were 14 (46.62% of the respondents). 7 of the rest 9 respondents disagreed while 2 strongly disagreed with the sufficiency of the width of the walkways.

From other point of view, the congestion of the walkways is a good measure which prevents snatchers from performing their crime. Therefore, when reconsidering the streetscape elements, this point may be taken into account.

The snatcher is, in many cases, a motorcyclist, performs the action and runs away. Therefore, when the walker feels that the distance between the walkway and the vehicular road is sufficient, the feeling of safety becomes more. In rating this case, 13 persons agreed that the walkways are too near to the road. This constitutes little more than 43%. Only 2 persons disagreed and think that the pedestrian sidewalks are not too near to the road.

When their opinion was sought on the safety while walking along the sidewalks, 15 respondents (50%) gave positive remarks as they agreed on the statement. Only 5 (16.6%) disagreed with the statement considering the sidewalk is not safe while walking. The remaining 10 persons (33.33%) are neutral. This reflects that people in general rates the sidewalk as safe.

Table (1): Safety indicators, relevant parameters and their scores frequency by male, female and total

Indicators	Parameters' statements	Scores and their frequency														
		1			2			3			4			5		
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Safety and Accessibility	a- The place is easy to access from outside	-	-	-		2	2	1	1	2	9	15	24	-	2	-
	b- It is safe when waiting for buses or taxi at the bus and taxi stop	1	-	1	2	7	9	5	6	11	3	6	9	-	-	-
	c- It is safe when walking from the access point to destination	-	-	-	2	4	6	3	8	11	5	8	13	-	-	-
Walkway design	a- The pedestrian sidewalks are wide enough for people during busy hours	-	2	2	-	7	7	6	8	14	4	2	6	-	1	1
	b- The pedestrian sidewalks are too near to the road	-	-	-	1	1	2	4	11	15	5	8	13	-	-	-
	c- It is safe when walking along the pedestrian sidewalks	-	-	-	2	3	5	1	9	10	7	8	15	-	-	-
	d- The waiting time at the crossing traffic lights is reasonable	-	-	-	1	3	4	4	7	11	5	6	11	1	3	4
	e- The materials of the sidewalks are comfortable to walk on	-	-	-	-	2	2	14	10	24	-	-	-	2	2	4
Night Lighting	a- The lighting is not blocked by trees or bushes	-	1	1	-	1	1	1	9	10	8	9	17	1	-	1
	B- The lighting illuminates the sidewalks well	-	-	-	-	4	4	3	8	11	7	7	14	-	1	1
Signage	a- There are sufficient signs (e.g. building name, street names) for you to identify your location	-	-	-	-	1	1	6	9	15	3	9	12	1	1	2
	b- There are directional signs or maps nearby which are helpful to identify your location	-	-	-	2	14	16	5	3	8	3	2	5	-	1	1
CCTV surveillances	a- CCTV surveillances are important to exist at every pedestrian walkway	-	2	2	2	2	4	9	10	19	2	1	3	1	1	2
	b- You feel safer under the CCTV surveillances	-	-	-	-	-	-	10	9	19	3	6	9	-	2	2

Four respondents strongly agreed that the waiting time at the traffic lights is reasonable, another 11 agreed with the statement. This makes the number of those agreed and strongly agreed at 15 persons which accounts for 50%. 11 persons were neutral and 4 disagreed with the statement. This outcome contradicts with the field observation conclusion on waiting time at the traffic light.

Inquiring about the materials used to cover the sidewalks showed that around 80% (24 persons) of the respondents were neutral. Only 4 persons (13.33) strongly agreed that the materials of

the sidewalks are comfortable to walk on. Two respondents disagreed with the statement.

c. Night lighting

In rating the statement that the lighting is not blocked by trees or bushes, 17 (56.66%) respondents agreed on the statement, one strongly agreed raising up the percentage of those agreed and strongly agreed to around 60%. This can be considered a positive indicator specially when we know that only one person disagreed with the statement and another one strongly disagreed. The remaining 10 were neutral.

When asked whether the lighting illuminates the sidewalks well, 14 (46.66%) respondents agreed and one more strongly agreed, 4 respondents (13.33%) disagreed and the remaining 11 (36.66%) were neutral. These results indicate that street lighting needs an enhancement.

d. Signage

Only one person disagrees with the statement that there is sufficient signs (e.g. building name, street names) to identify the location, no response came under strongly disagree. Significant number of responses (15 responses, 50%) were neutral while 2 responses came under strongly agree. Although almost nobody disagree with the statement (only one), the large number of the neutrals (15 out of 30) hinders us from strongly concluding on people satisfaction with the signs in the area. The outcome of analyzing the responses that rated the availability of directional signs is alarming. 16 persons (53.33%) gave negative rate as they disagreed with the statement, only one person strongly agreed and 5 persons (16.66%) agreed. The remaining 8 respondents declared their neutrality.

e. CCTV surveillances

There is almost a balance between those who agreed and those who disagreed with the statement that CCTV surveillances are important to exist at every pedestrian walkway. 4 people disagreed and 2 strongly disagreed while 3 agreed and two strongly agreed. What drives the attention here is that half of the respondents were neutral in rating this statement.

None of the respondents disagreed or strongly disagreed that they feel safer under the CCTV surveillances. Significant number were neutral (19 persons, 63.32%), nine persons agreed and more two strongly agreed. In spite of the significant number of neutral respondents, the result indicates the importance of the presence of CCTV to the walkers. This point however, requires further investigation and larger sample is required and various places in the city centre.

3. On street Interviews

The vast majority of the interviewees appreciate the accessibility to the road. Some however, were concerned about the lack of accessibility to the disabled. Important points were raised up by the interviewed people regarding the sidewalk design as follows:

- Overall design of the sidewalk under study is poor;
- Poor conditions of the secondary walkways along the secondary roads.
- Poor maintenance of the sidewalk.
- Absence of shelter from rain.
- The sidewalk is crowded during the peak hours.
- Insufficient width of the sidewalk.
- Presence of obstacles that hinder the people's movement on the sidewalk.
- Insufficient time of the traffic light for pedestrian.
- Vehicles stoppage on the crosswalk.

In general, sidewalk night lighting was satisfactory to the interviewees. Some mentioned that the road even gains light from the buildings along it. Lack of sufficient lighting along the secondary walkways has been mentioned as an important issue.

The overall signage at Bukit Bintang area is poor. This is the interviewees' opinion. The interviewees could not orient themselves easily when they came to the road for the first time. Some recommended more signage at the junctions specially in the direction to go to shopping malls.

All the interviewed persons feel unsafe while walking in the area. Some attributed that to the reputation of the road of being a high crime rate area. Some strongly suggested the installation of security guardian system such as CCTV.

CONCLUSION

The three-level method to assess the walkability of pedestrian environment was beneficial in producing information on a wide range of parameters. With regard to safety as a part of walkability assessment and which was the focus of this paper, the investigation reveals that the selected area for study suffers from some critical issues. High vehicles speed running on the main street, the relatively short time given at the crossing for pedestrian to cross the road, the materials used, congestion and feeling of safety are the main issues. These issues provide a solid background related to safety components of walkability for the next research activities.

This study also reveals that there is a need to evaluate the existing streetscape elements and define the required changes to improve the quality of the sidewalks to facilitate pedestrian movement. While evaluating and improving the streetscape elements the guidelines given in the Malaysian guide book for the crime prevention through environmental design need to be taken into account. For instance, the lighting should permit the identification of a person's face from about 10 metres for people who have normal vision (Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia, 2010). Such details need to be considered in the evaluation and met in the up-gradation process.

One more important finding is that in several cases in the survey, a significant number of the respondents rated the statements as neutral. This strongly affected the analysis. This encourages us to suggest that in similar investigations in the future activities of the research project where form this paper is taken, neutral option may be eliminated. Four points scale may be more practical.

REFERENCE

- C.E. Kelly , M.R. Tight, F.C. Hodgson, M.W. Page. (2011). A comparison of three methods for assessing the walkability of the pedestrian environment. Journal of Transport Geography, 19 (2011) 1500–1508.
- Edmonton, T. C. (2008). Walkability strategic project [Online]. Retrieved 7 May 2013, from http://www.edmonton.ca/transportation/cycling_walking/walkability-strategy-project.aspx.
- Gehl, J, Gemzoe, L, Kirknas, S, Sondergaard, B., S. (2006). New City Life. Copenhagen, the Danish Architectural Press.
- Glasgow Centre for population health. (2007). Health and physical characteristics of urban neighborhoods: critical literature review. Briefing paper 2, concepts series. [Online]. Retrieved Jun 15, 2013, from http://www.gcph.co.uk/publications/153_health_and_the_physical_characteristics_of_urban_neighbourhoods
- Godman, R. &Tolley, R., (2003). The Decline of Everyday Walking in the UK: Explanation and Policy Implications. In R.S. Tolley, Sustainable transport: planning for walking and cycling in urban

- environment (pp.70-81). Cambridge, England: Woodhead Publishing Limited.
- Governemtn of Malaysia. (n.d.). Chapter 5: Developing Greater Kuala Lumpur/Klang Valley as an engine of economic growth [Online]. Retrieved 7,May, 3013, from http://etp.pemandu.gov.my/upload/etp_handbook_chapter_5_greater_klkv_20120625.pdf.
- Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia. (2010). Crime Prevention Through Environmental Design (CPTED) Implementation Guide. [Online]. Retrieved May 30, 2013, from [http://www.townplan.gov.my/download/Penerbitan/NKRA/Panduan%20Pelaksanaan%20Crime%20Prevention%20Through%20Environmental%20Design%20\(CPTED\)%20-%20Implementation%20Guide.pdf](http://www.townplan.gov.my/download/Penerbitan/NKRA/Panduan%20Pelaksanaan%20Crime%20Prevention%20Through%20Environmental%20Design%20(CPTED)%20-%20Implementation%20Guide.pdf)
- Japheth Lim. (2012). Walkability within Kuala Lumpur city centre, ETP Chapter 5, EPP 8 [Online]. Retrieved May 12, 2013 from <http://blog.japhethlim.com/index.php/2012/09/18/walkability-within-kuala-lumpur-city-center-etp-chapter-5-epp-8/>.
- Lennard, S.C & Lennard, H. (2008). The principle of true urbanism [Online]. Retrieved May 19, 2013, from <http://www.livablecities.org/articles/principles-true-urbanism>.
- Litman, T. (2010). Measuring transportation: traffic, mobility and accessibility. *ITE Journal*. 73 (10), 28-32. [on line]. Retrieved 5 March 2013, from [http:// www.vtpi.org](http://www.vtpi.org).
- Norsidah Ujang, Atirah Salim and Suhardi Maulan. (2012). The influence of context and urban structure on the walkability of Bukit Bintang commercial district, kuala lumpur. *Alam Cipta Vol 5 (1)*
- PEMANDU. (2011). Economic Transformation Programme, 6 sectors of transformation [Online]. Retrieved June 30, 2013 from http://etp.pemandu.gov.my/upload/6_Secrets_of_Transformation-1_April_2011.pdf
- Praveen K. Maghelal and Cara Jean Capp, (2011). Walkability: a review of existing pedestrian indices. *URISA Journal Vol. 23, No. 2, 2011*. [online] retrieved June 25, 2013 from http://www.urisa.org/files/Maghelal%20and%20Capp%2023_2_0.pdf.
- Said, H. M. (2011), Is Greater KL ready to be a liveable, world class city? [Online]. Retrieved March 12, 2013, from <http://transitmy.org/2011/03/12/is-greater-kl-ready-to-become-a-livable-world-class-city/>.
- Shuhana Shamsuddin, Nur Rasyiqah Abu Hassanb & Siti Fatimah Ilani Bilyamin. (2012). Walkable environment in increasing the liveability of a city. *Journal of Procedia - Social and Behavioral Sciences* 50 (2012), pp. 167 – 178.
- Stephen, M. (2004). *A Better Urban Design of Cities is Closely to Sustainable Planning*. United States: Rutledge Urban Reader Series.
- Theresa, A., Glanz. (2011). Walakbility, social interactionand neioughbourhood design [Online]. Retrieved May 20, 2013, from http://digitalcommons.unl.edu/arch_crp_theses/6/.
- Tolley, R. (1990). *The Greening of Urban transport: Planning for Walking and Cycling in Western Cities*. London, Belhaven Press.
- Wong, Seng Fatt. (2011). Walkability and community identity in the city centre of Kuala Lumpur, PhD thesis report, Faculty of Architecture, Building and Planning, The University of Melbourne. [Onlinw] retrieved March 30, 2013 from http://dtl.unimelb.edu.au/view/action/nmets.do?DOCCHOICE=273131.xml&dvs=1368583443356~420&locale=en_GB&search_terms=SYS%20=%20000062025&adjacency=N&VIEWER_URL=/view/action/nmets.do?&DELIVERY_RULE_ID=4&usePid1=true&usePid2=true.

URBAN TRANSPORTATION SYSTEMS LIKE METRO LANDSCAPE DESIGN AND ITS RELATIONSHIP WITH FORM, FUNCTION AND AESTHETIC

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ABSTRACT

'Metro station landscape design' refers to the landscape of railway stations and their facilities. This article describes the importance of the landscape of railway stations, which includes as its elements both the agreeability of the station (an element depending largely on the form, functions, and aesthetic of the station), as well as the safety and accessibility (convenience) of the station. The landscape of a railway includes as its basic elements such visual images as space, lighting, scale, and detail of the railway. It also embraces the landmarks, railway, brand design of the operator and even public art, commercial activity, advertising, etc. The conclusion is that modern railway operators in Europe and Japan give careful consideration to the landscape of their new high-speed trains and modern stations while striving to enhance the agreeability of their stations by including barrier-free and universal design. Through various improvements, modern railway stations are becoming still more modern and offer more aesthetic public space. The landscape of railway stations is also becoming an important consideration in urban redevelopment projects and sustainable development of communities. In Japan of the past, the 'quality of places' was not as widely recognized as in Europe and was seldom discussed in earnest. However, in recent years, it is being recognized increasingly due to changing social conditions and growing public interest in a better living environment.

Key Words: Railway Stations, Landscape design, form, aesthetic.

INTRODUCTION

'Railway landscape design' refers to the landscape of railway stations and their facilities. This article describes the importance of the landscape of railway stations, which includes as its elements both the agreeability of the station (an element depending largely on the form, functions, and aesthetic of the station), as well as the safety and accessibility (convenience) of the station. The landscape of a railway includes as its basic elements such visual images as space, lighting, scale, and detail of the railway. It also embraces the landmarks, railway, brand design of the operator and even public art, commercial activity, advertising, etc.

The conclusion is that modern railway operators in Europe and Japan give careful consideration to the landscape of their new high-speed trains and modern stations while striving to enhance the agreeability of their stations by including barrier-free and universal design. Through various improvements, modern railway stations are becoming still more modern and offer more aesthetic public space. The landscape of railway stations is also becoming an important consideration in urban redevelopment projects and sustainable development of communities. In Japan of the past, the 'quality of places' was not as widely recognized as in Europe and was seldom discussed in earnest. However, in recent years, it is being recognized increasingly due to changing social conditions and growing public interest in a better living environment.

Landscape and Design:

The term 'landscape' generally refers to the aesthetic and refined elegance of a specific object. The quality of a landscape is evaluated based on its design and overall impression. The concept of landscape embraces many different elements. These elements include size, form, feel, color, etc., evaluated in terms of visible qualities by stereotyped analysis. They also include subjective factors, such as utility, designer's intention, visual and psychological impressions, surrounding conditions (background), uniqueness of structure, atmosphere, etc. Landscape depends on its relationships with form, function and aesthetic. With changing times, these relationships have changed according to contemporary architectural styles. For engineers, function is always most important and structures they design and build always have defined functions. Railway stations are constructed as the major facility for railway passengers and have various purposes. In the past, railway stations in Europe and the USA influenced the quality of contemporary architectural styles and remained standard structures until the station buildings were revolutionized in terms of structure, form and function.

The landscape characteristic of a specific object is influenced by design. The word 'design' has two meanings: 'to hammer out an idea' and 'to express an idea as a specific form.' Therefore, design not only means ornamentation but also incorporates the creative process of expressing a designer's intention by a specific form.⁴

In the 1980s, civil engineering began to deal with landscape design and the aesthetic of structures became a subject of long discussion. Landscape was recognized first in bridge and dam construction projects. With the economic growth in the 1980s, design also came to be recognized in the fashion world and then spread to consumer products. The 'brand design' phenomenon represents the consumer's recognition of products that can be achieved by a collection of refined products, including effective advertising. At railway stations, the application of design to the interior of a restaurant can be cited as an example of fashion or style. Specific examples include the New York- style restaurant at atré Shinagawa mall in Shinagawa Station on JR East's Tokaido main line and the Starbucks Coffee shop, sushi bar, etc. In the past, design was related to architecture, structure, product, landscape, and urban design. In the last 15 years, it has become a term of wide comprehension—barrier-free design, universal design, information design, computer design. These new concepts can now be seen on trains and in stations too¹.



Fig1: Canary Wharf Station on Jubilee Line Extension in London

Basic Factors in Landscaped Railway Station:

The 'landscape of a railway' means the aesthetics of the stations and other facilities. The railway station and its facilities constitute a station building with concourses for railway users, tracks, platforms, and even space for commercial hotels, shopping areas, etc., that are not basic functions of the railway station. The landscape of a railway station can be defined as the total balance of the station interior and exterior, the building's architectural style, the engineering structure, the facilities for movement of railway passengers, etc., that are all considered in the planning, layout, detailing and design of the building. An aesthetic station should be easily identifiable, friendly to people and easy to use. At the same time, it should provide a nice and rich environment. The basic aesthetic factors in the design of a railway station are space, lighting, scale, and detail. Aesthetic factors may also be found in the image-related design background, characteristics of nearby symbolic buildings, image of the railway, brand of the operator, etc. In any case, the aesthetic factors are related to the distribution of functions and the commercial roles of the station, such as offering a space for advertising.

Space is an important factor. Every station must provide adequate space for the many people using it. The station space is where people freely move through, spend time between trains, buy railway tickets, rest before and after their journey, etc. Every railway space that is designed nicely and appropriately, like Frankfurt/Main Flughafen Fernbahnhof—a railway station designed by the architects Bothe-Richter-Teherani—offers a high degree of safety and well-being. For example, the glass lift helps reduce users' uneasy feelings of confinement, and the universal design offers disabled people easy access. Glass used for lifts, floors, staircases, handrails, etc., like at Koln-Bonn Flughafen Bahnhof, also helps make the space seem wider by enhancing transparency of facilities. This is especially important in underground concourses of subway stations. Canary Wharf Station on the Jubilee Line Extension in London and new stations on Minatomirai Line in Yokohama have both used glass effectively. A well-planned station is one that allows free movement of users not only through the station building but also in the public spaces, including neighborhoods shopping areas and streets. In Japanese cities, many urban railway stations are used by millions of passengers every day. However, due to their locations, it is difficult for these stations to secure adequate station space compared to modern railway stations in Europe. Huge terminals in Europe are utilized by hundreds of thousands of passengers every day.



Fig2: Minatomirai Station on Minatomirai Line in Yokohama

Lighting is another important station function. At very large stations, the roles that architecture and structure play in lighting are among the most important considerations. A characteristic lighting structure such as that at Lyon-Satolas Station on the TGV line improves the impression of the station space. The best lighting uses natural light admitted to the station interior through glass in the roof and walls. The visual linkage between the platform and concourse improves as the amount of natural light passing through the platform increases as at Lille- Europe Station on the TGV line. Sophisticated lighting from the entrance of a subway station intensifies the architectural impression of the station and makes the station layout clearer. At Canary Wharf Station designed by Sir Norman Foster, the natural light admitted into the station interior helps passengers easily recognize the entrances and exits. The ceiling illumination helps create a safe environment and intensifies the architectural characteristics of the station interior. Illumination also has an information communication function; well-designed electronic information displays like those at Magenta Station on the RER in Paris designed by Jean-Marie Duthilleul make it possible to guide each passenger in the right direction easily and safely. Although coordination of architectural style, illumination, and space has been achieved at many stations, it is hard to achieve interesting illumination in subway structures, which hardly admit natural light¹.

The scale factor should be determined based on how many passengers use the station. Huge railway terminals in Europe, such as St Pancras Station and Paddington Station in London, are designed not only to provide passengers with suitable space but also give a good impression. These grandiose stations, which resemble Gothic-style cathedrals, have had various political and social meanings over their lives. On the other hand, smaller stations have been designed based on a more human scale with lighting helping to make the space seem wider. For example, modest-scale local stations generally use glass in roofs and walls to admit plenty of natural light. However, some recent big stations in Europe have achieved a touch of this human scale by creating wide spaces filled with natural light and equipping them with diverse functions allowing seamless movement. Although the scale of Lyon-Satolas Station is comparable to that of an airport, the large station hall designed by Santiago Calatrava is characterized by a unique combination of spatial structure and light representing the fusion of advanced structural engineering technology and superb architectural style. Detail should be designed so the station both meets specific purposes and performs the many different station functions. Well- harmonized details that are easy to recognize and understand are integrated using structure, space, and light and are discriminated by colour and material.

Using glass and colours for lift details is a means of designing attractive interiors that has become part of recent universal design. Similarly, escalators offer potential for exceptionally artistic design. For example, in Japan and Europe, universal design is being applied positively to new railway, subway and LRT stations that are being equipped with lifts, escalators, and toilets with fixtures installed at heights for physically disabled people. Likewise, the station pavement uses an embossed finish that is safer to walk on. In addition, there are various other measures to facilitate movement by physically disabled people, such as eliminating level differences between platforms and car floors and providing slopes and indications to facilitate movement. Although it is difficult to immediately make all station facilities barrier-free, high priority is being given to barrier-free facilities at especially important stations, such as Nippori Station on JR East's Yamanote Line in Tokyo, which is a transfer for the Keisei Electric's Skyliner connecting Ueno Station and New Tokyo International Airport (Narita).³

Although the comfort of passengers can be improved by installing well-designed benches, waiting rooms, snack bars, notice boards, etc., it means that the 'landscape of a station' requires concurrent design of station functions and aesthetics. If the landscape can be regarded as the aesthetic of form, the function is the efficient continuation of activities performed at modern stations.



Fig3: Ikebukuro Station on Yamanote Line in Tokyo

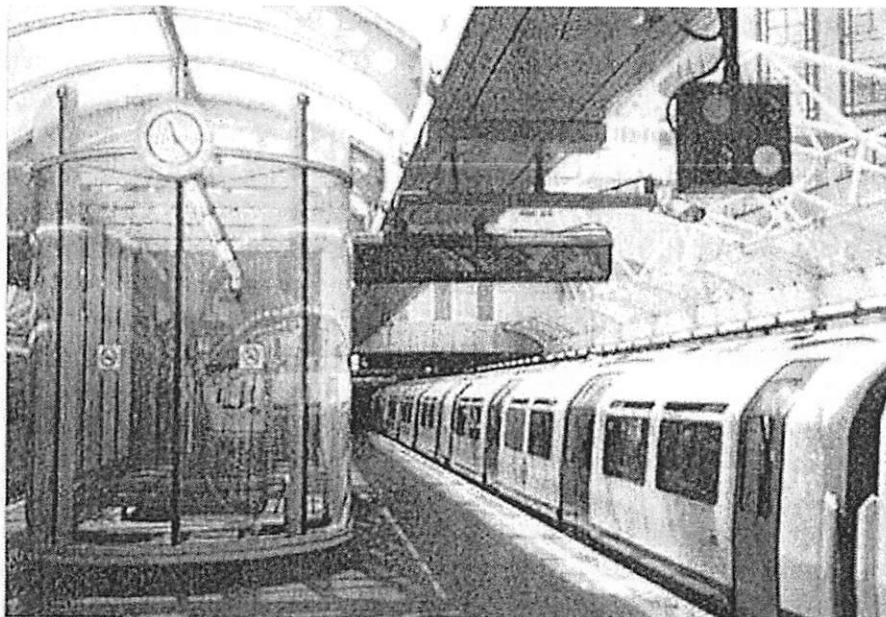


Fig4: Hammersmith Station in London

Basic Image of 'Landscape Railway Station:

The image of a station has much to do with its design. The design of—which can be a landmark in its locality—is influenced by the historical and social backgrounds of the locality, as well as the station location. The symbol of the railway and its operator is the landscape factor creating a specific image of the railway.²

The station is understood as a landmark in its locality and the elements constituting the image have much to do with the historical, cultural and social backgrounds of the locality. Railway stations in Europe historically faced a thoroughfare with a plaza at the front. Due to its impressive façade and spacious plaza, the station was seen both as a gateway to the local city and a landmark. The symbolic position was often reinforced by a conspicuous clock tower, like that at Amsterdam Central Station, and

impressive depot. However, most historic stations in Japan are not very impressive in terms of scale or form but some stations, like Tokyo Station and Den'enchofu Station on Tokyu's Den'en Toshi Line have become landmarks. Modern stations in Europe have been designed as important urban facilities, and some are so grandiose that they have become city symbols.¹⁰

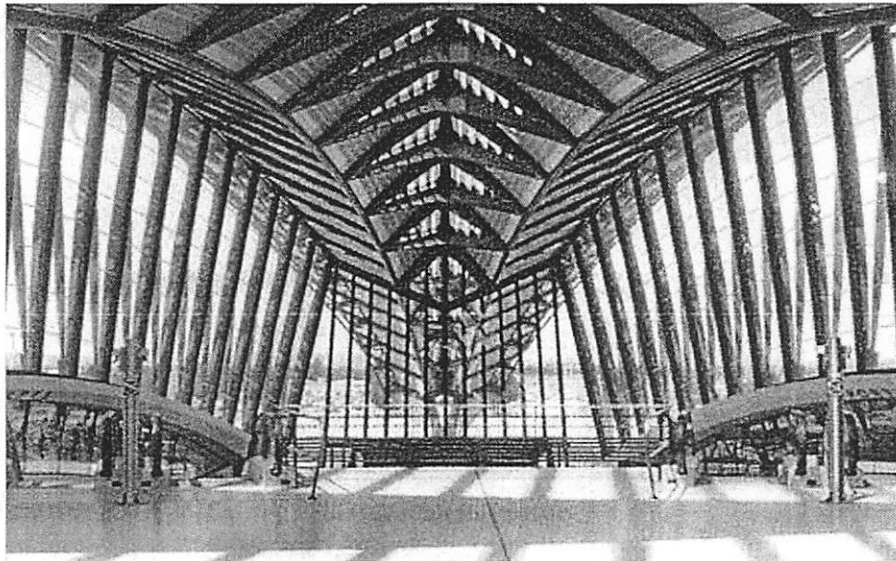


Fig5: Lighting from impressive structure at Lyon-Satolas Station

The elements constituting the image of a station include the station design expressing the image of the railway or operator. For example, to express the image of the Paris Metro, the unique station entrance symbol was modeled on the Art Deco entrance designed by Hector Guimard at Abbesses Station in Paris. The London 'Tube' sign and London Underground Limited logo are also easy to identify and the round Tube sign is widely recognized as a transport brand. Company logos are part of the concept of corporate activities and are being re-evaluated by many transport operators in Europe. For example, the Deutsche Bahn AG (DB AG) logo has been changed to improve public recognition through a simpler modern design. The Tokyo Metro is another example of dramatic change after rebranding from its predecessor Teito Rapid Transit Authority (TRTA) in 2004 when the former logo was replaced by a blue M representing the company name better and offering easier understanding for both Japanese and foreigners. Some subway entrances stress the M sign but more are now emphasizing the unique atmosphere of their buildings, such as the brick-walled Bashamichi Station on the Yokohama Minatomirai Line designed by Hiroshi Naito.

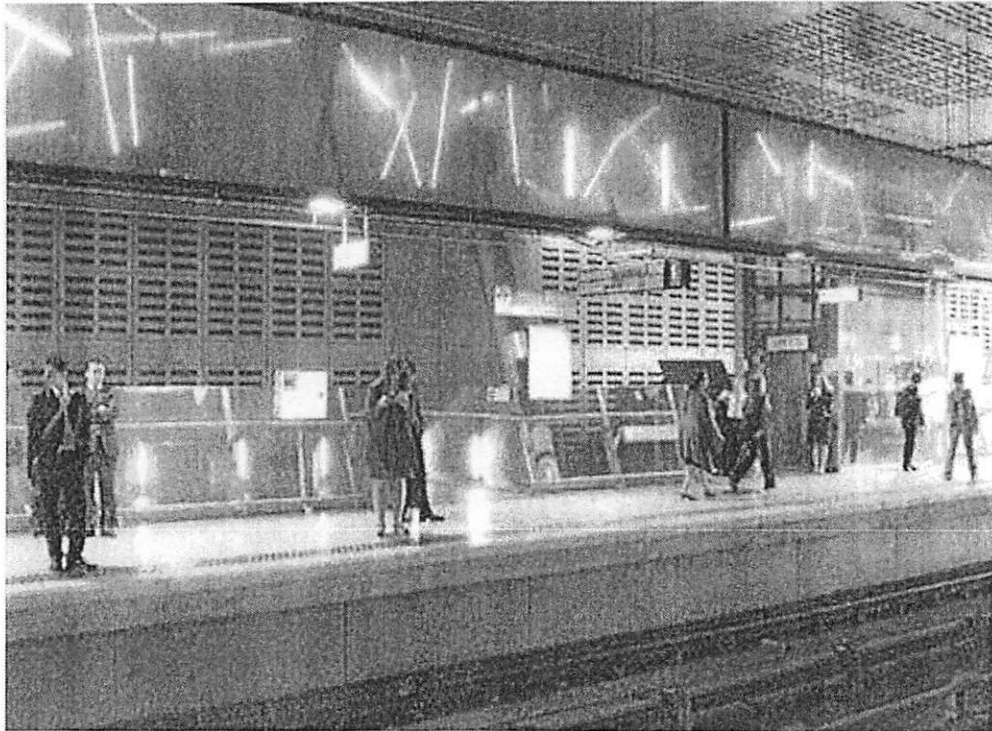


Fig6: Heron Quays Station in London

However, the image of a railway operator is influenced not only by the company logo but also by the design and color of its signs, its traditions, its attitude toward public art, etc. Public art can play an important role in improving the image of a railway. In view of the importance of introducing culture and art to stations, many railway operators have come to appreciate public art and art is becoming part of the individual railway culture. It is well known that a well-designed station has a comfortable waiting space and improves the satisfaction of passengers by using clear information signs, exhibiting art, holding cultural and local events, implementing other activities that enrich the travelling experience, etc. Artworks were part of projects to renew the Paris Metro, London Underground, and the Strasbourg LRT. When introducing art in renewing the Paris Metro, the operator RATP explained that it represented 'support for aesthetics,' meaning that the transportation network was the 'scenario' for building urban culture. Urban cultural stages have been created at major stations like Louvre-Rivoli Station and St. Germain de Pres Station in Paris. In addition, live art events and live music have become familiar at subway stations in Paris and London. Public art can be expressed as murals using many materials, colored glass in windows and lighting fixtures, floor and paving patterns, sculptures, station gardens in plazas, etc. In Europe, public art projects are supported by the government. Art has been introduced to railway stations in Japan too.

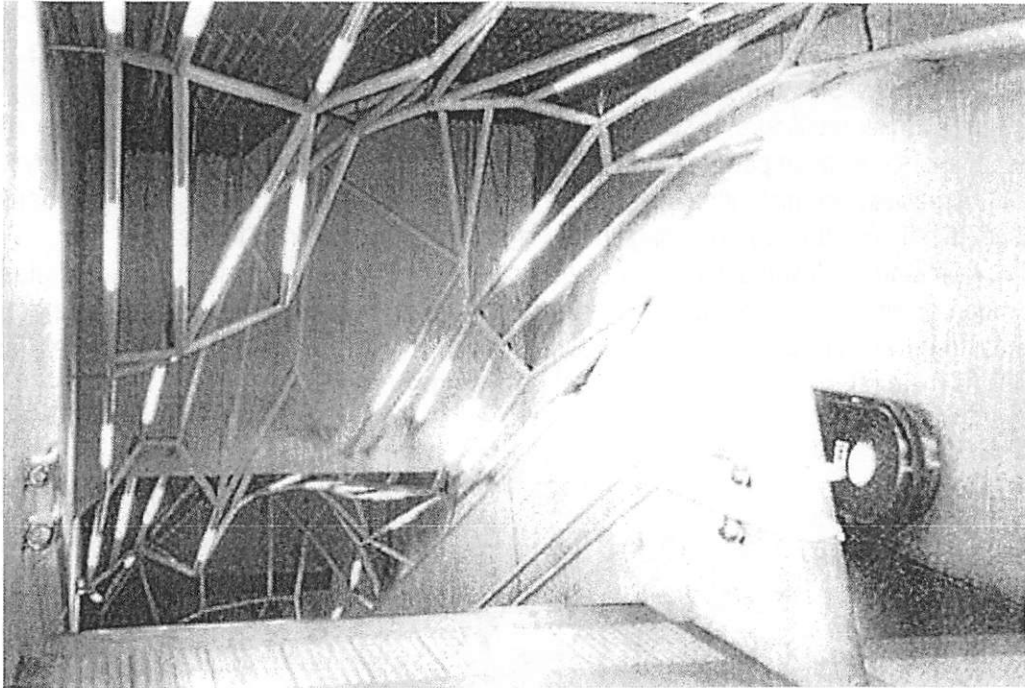


Fig7: Iidabashi Station on Oedo Line in Tokyo

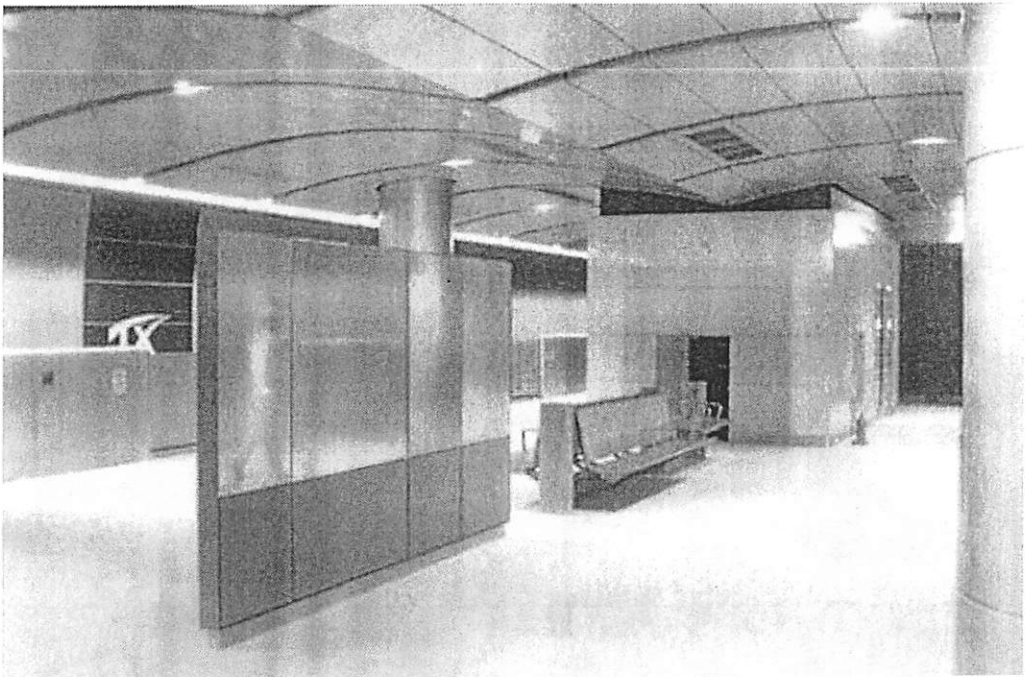


Fig8: Tsukuba Express Akihabara Station in Tokyo

Commercial Role of Station and 'Landscape of Railway:

The functions of a railway station include commercial functions influenced by the form and functions of the station. The traditional model station has the principal transport functions plus travel-related functions, such as restaurants and hotels. However, in the course of their development, stations have come to perform many other functions too and many now serve as interchanges linking the railway to an airport, other railways, buses, commercial centres, hotels, shopping centres, etc. In other

words, railway stations have become key hubs offering various attractions and new experiences. As part of its activities, each operator is improving its products to enhance its image. However, commercial functions at some stations in Japan outweigh transportation functions, causing confusion. Personally, I think retailing at a station should be done in a reasonable manner while meeting the needs of users, because performing transportation and commercial functions concurrently is extremely difficult, especially in historic stations that need modernizing. DB AG's Leipzig Central Station succeeded in this respect by arranging shopping malls at three different levels.⁸

Commercial development of a station can be achieved by creating an 'integrated' shopping mall merged with the public space of the station, supplying passengers with non-transportation services, and establishing a 'retail store line' formed by a passage lined with stores, etc. A good example is the modern retail stores lining a glass-walled corridor in the

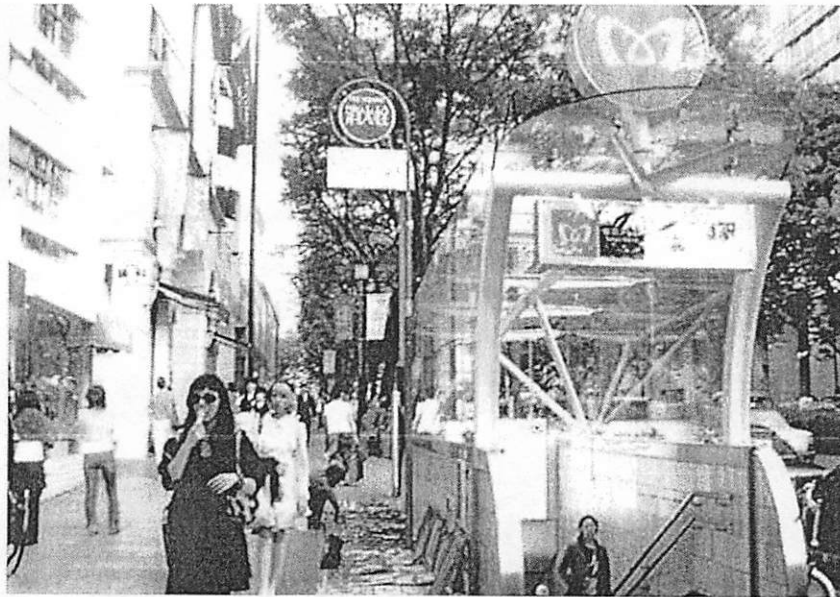


Fig9: Subway entrance at Omotesando Station in fashionable quarter of Tokyo with new Tokyo Metro logo



Fig10: Embankment Station of London Underground

Central part of Liverpool Street Station in London. Separating different levels of functions is effective in managing passengers and non-passengers. However, at some huge stations in Japan like Ikebukuro Station, retail stores are installed in the station space as far as possible and some even occupy part of the space reserved for the principal transportation function. Such an inconsistent approach to the commercialization of stations has caused a number of undesirable results, including confusion and overcrowding of station space, conflict between interior design and architectural style, and poor passenger flows.⁶

The response to advertising at railway stations is reflected in the recognition of landscape of public space. The landscape of public facilities has not been fully recognized ever since the demolition of historic structures started in the 1970s. Most stations built in the 1970s were lacking structural aesthetics and to paraphrase Ashihara, 'despite their highly public nature, ... were filled with commercial advertisements so much that it was difficult to determine whether they were railway facilities or commercial facilities.' However, as long as station advertisements are filled with design concepts of cultural and healthy lifestyles and help enhance the station image, they can be part of the landscape design. Advertisements in the Paris Metro constitute an integral part of the station walls. In Japan, due care should be taken in handling station advertisements, especially in historic terminals. At London's Paddington Station in London, advertising was planned in the renewal project and advertisements now form part of the design concept and are nicely fused with the building structure. Today, various advertising media are available, including traditional, spot lit and backlit posters, moving displays, TVs, plasma displays, messages on staircase and escalator walls, advertising in and on rolling stock, 'blitzing' the entire station with advertising by a sponsor, implementing various sales promotional campaigns, etc. It is important to establish a reasonable relationship between architectural style, corporate design and advertising media, and give due consideration to the balance of station space and advertising size and amount. As one extreme, many stations in Japan are literally covered with advertising and even Shibuya Station designed by Kengo Sumi and subsequently highly modernized is overly decorated with advertising.⁷

CONCLUSION

The importance of the railway landscape is due not only to the direct influence of railway users but also to the visual effect of the surrounding environment. In recent years, more operators are beginning to recognize the importance of landscaping in their railway renewal policies aimed at improving their corporate design and enhancing various amenities. In Europe, the involvement of architects in railway landscape design is decided by competition. In Japan, architects, city planners, and researchers are nominated by a design committee and discuss their design. In Europe, the importance of the railway landscape is widely recognized in the context that good design as a marketing resource appeals to railway users and that a well-designed station helps improve the image of the railway and its operator. Since the general public is not attracted by stereotyped stations, due consideration should be given both to the quality and to the diversity of design. In this context, it is necessary to take a consistent approach and systematize indications, assuring visual recognition of the 'brand design' of the railway company and design diversities influencing the design, color, etc., of furniture and other fixtures. The aesthetic factors in landscape not only afford comfort to the passengers but also help improve safety of the general public. It is especially important to increase the transparency of the station through use of a wide space and glass roof and walls and thereby permit easy access to the station. Concerning the relationship between form and function, due consideration should be given to balance.

Ideally, station development should ensure that the architectural coordination of station building, platforms and streets forms part of an urban design that matches the city environment. Landscape also has to do with economy. Securing a budget for landscaping and additional budget for

enhancing the value of landscape has become engineering common sense. More often than not, landscaping and economy are seen as contradictory. The fusion between architecture and engineering is becoming clear looking at complex problems in recent railway stations in Europe. New stations that are designed to attract many passengers are influencing the architectural style applicable to new railways. Namely, an architectural structure balancing form, function and aesthetic is called for.

Today, local governments are also managing urban transportation development projects along with urban redevelopment projects. Traditionally, the roles of stations in rail transport have been shaped by time and money and transportation facilities were seen as a means of promoting urban economic activities. However, today, the task of achieving sustainable development in Europe is pressing ahead based on the concept that 'environmental quality' helps promote economic growth.

The landscape of transport facilities can be used positively as a means of rebuilding space by various methods. In Europe, many modern metro and light rail transit systems are contributing to a better urban life. The modernization of railways that accompanies urban redevelopment has a similar favorable effect. In Japan, the approach to landscape involves everything, from the railway operator's philosophy about landscape to its managerial stance on achieving optimum balance between landscape and cost. It depends heavily on the degree of the general public's recognition of the public role of stations in improving the agreeability of railways.

REFERENCES

Maria Kido, E. Railway landscape design, Japan (2006).

Institute of Urban Transport, Kansai Railway Association. Railway Network in the Kinki Region and Transitions along Railroads. Research Series No. 29. (2004).

National Institute of Population and Social Security Research. Population Projections by Prefecture for 2005-2035 (May 2007). Health & Welfare Statistics Association.

Hankyu Corporation. HANDBOOK HANKYU 2008. (2007)

Maria Kido, E. Railway Universal Designs and Architectural Features, Japan (2006)

Akiyama, T., Tanaka, N. and Okushima, M. Discussion for Potential of Railway Station in Kansai Urban Region. "Infrastructure Planning Review" 24: pp. 207-216. (2007).

Akiyama, T., Okushima, M. and Kitamura, R. The Basic Analysis of Railway Travel and Shopping with the Trip Survey Database. "Transportation Studies" 48: pp. 169-178. (2004).

Institute of Urban Transport, Kansai Railway Association. Empirical Research on Railway Stations and Towns. Research Series No. 34. (2008).

Akiyama, T. Okushima, M. and Kitamura, R. The Empirical Analysis of the Railway Station and Town Management Concerning with Urban Activities. "Transportation Studies". (2008).

Okushima, M. Akiyama, T, and Kitamura, R. The Analysis of the Railway Station and Town Management with a Focus on Travel Behavior of the Elderly. "Transportation Studies" (2009).

THE CONCEPT OF SELF-CONSERVATION IN KAMPONG KAUMAN OF ETHNIC SEMARANG CITY

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ABSTRACT

A good city is able to maintain and preserve its cultural identities. Unfortunately, the modernism pressure of capitalism has dangerously threatened many inherited cultural artefacts. The coming of the global market era becomes threat to Kauman society that is socially built for more than three centuries. As an idealist society, these people have their own strategies in preserving and managing their settlement space. For the member of this society, preserving the cultural identity is not only useful for social life but also useful for economic life

The researchers use qualitative paradigm and ethnographic architecture method combining Ideographical and architectural approach.

The result shows that the self-conservation concept is found not only in the material domain but also in immaterial one. First, the Kauman people maintain historical artifacts. Second, the trader community took over properties for social and economic change. Third, the Kauman people establish moral-spiritual educational institution for youth. This social cohesion will be important social asset for protecting the urban culture and wisdom.

Self-conservation conducted by Kauman community is an effort in preserving cultural wisdom. It can be achieved in a community having tight social relationship. The concept is also can be used in other community preserving cultural features.

Key words: *architecture, social cohesion, self-conservation.*

INTRODUCTION

Kauman is a community that is near to The Semarang Grand Mosque. This place is regarded as the settlement for the Muslim community such as Muslim clerics and *santri* students. They are capable of trading and even they preserved their pure.

The Modernization-industrialization pressure pushing Semarang as Javanese cosmic city . The concept of cosmic is a united between spiritual power, and political power shaped by the settlement which is based on ethnic group or daily activity one of the sample is *Kauman* people.

Since *Johar* market was built in 1937, in the *Kota Lama (old city part)*, the rate of trading income significantly increased; and this capitalism pressure influence *Kauman* area in the form of the growth of commercial business activities, room rental / lease to home workers, home-based businesses and cottage industries and warehousing. These activities are regarded as penetration to the business in *Johar* area and surround it. Recently, *Kauman*, regarded as 'central of socio-cultural' of Semarang is in transition time due to the pressure from central business district and force *Kauman* people to adapt by changing the expression of their settlement space.

METHODS

Ethnography-architecture: Ethnography (derived from 'Ethos' from Greek meaning people or citizen, and 'graphien' meaning writing) is a methodological strategy used to provide description of social humanitarian problems. It emphasizes on the perspective of the actor in seeing the world as it appears to others and in understanding the subjectivity of others (Jessor et al.in Suprapti 2010). Ethnography is now used to describe both ethnography as a practice-fieldwork in which participant observation is central, but which may also include other approaches such as interviews and qualitative surveys (Atkinson et al in Suprapti, 2010). Ethnography-architecture research on space also limits social problem of single space, and explores architectural space in detail. It includes socio-cultural life of the community, the real terms of the space, the elements of space tools, the arrangement of space structure and the relation among elements of space that constructs the meaning of space.

Research analysis steps:

Grand tour (Figure 1): Preliminary observation on field (grand tour) is also called descriptive observation. Initially, observation over the entire area is conducted in order to have initial description of the entire area of research (Fig. 1) where main activities and spaces are located. (Suprapti, 2010). Finding the social situation of space is a particular area that covers specific socio-cultural life of a group of societies. The researcher participates in the regular level. It means the researcher has to maintain his/her complementary position as both insider and outsider, and also as both participant and observer. Types of data/information include, information of socio-cultural phenomena and data of physical elements.

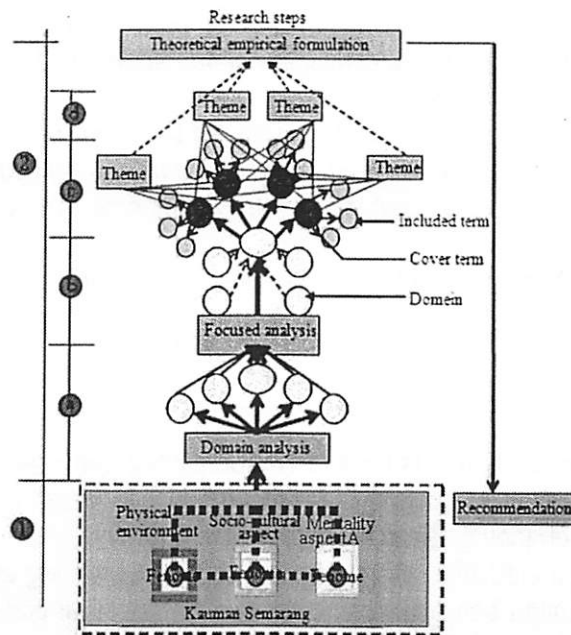


Figure 1: The diagram of research steps, (Suprapti, 2010).

Whereas the documenting of physical element is concluded by implementing some steps below:

- Doing visual photography, to complete data of building and space.
- Measuring of territorial space object to gain space & building dimension.
- Describing space, building and environment.
- Using the blueprint of the building to indicate the existence of buildings.
- Doing field note

Deep observation (mini tour):

Domain analysis: Space domain is a category of empirical space meaning which includes a smaller number of categories. There are steps that are needed to be arranged to discover the domain. Firstly, initial domain is needed to be discovered in order to find the names of original domain. Secondly, domain analysis is required to find other domains and to examine the hypothesis, whether it will support or weaken the hypothesis. Thirdly, the researcher have to arrange structural questions. Next, conducting semantics relation analysis which is aimed at giving direction to the meaning of culture. Semantics relation here means that the relation of the capacity inside such matter. In the domain, there are smaller categories, called *sub domain* that possesses their own rules. Sub domain is category of space culture knowledge.

Focused analysis: Focused analysis is required to have a deeper observation toward the previous domain observation stage. These are some considerations should be taken in regarding analysis: (1) research focus, (2) information from the informants, (3) theory (Spradley, 2007). After determining one focus of observation, research focus should be directed to focus observation by analyzing symbols.

Taxonomy analysis: Taxonomy analysis refers to the internal structure of the domain. Its objective is to find the arrangement principles (taxonomy) of the original terms in the domain. Taxonomy is a set of category arranged based on a single semantics relation. Taxonomy shows the relation among the original terms in one domain. The original terms in this domain come from the relation among the original terms.

Here, in the ethnography-architecture, the relationship among symbols is focused on the spatial aspect. The researcher not only narrates symbols gained from the informants, but also presents those symbols in the forms of pictures/ sketches, diagrams/ spatial relationship. The meaning itself can be acquired by asking the informants. Several principles of architectural symbols that can be used to discover meaning include:

- **Functional principle:** The relationship between function and environment (other functions, climate, society), the functional relationship upon spatial structure, the composing elements, the management and convention.
- **Social convention principle:** How symbols possess backgrounds such as idea, purpose, activity/function, physical appearance.
- **History:** how the relationship between symbols and the past is seen (political and economical background when the symbols were created).

Theme: The cultural theme of space is a repeated cognitive principle in a number of domains which happens in a hidden or open way and is considered as the relationship among the systems of meaning branches (Spradley, 2007). Cognitive principle generally takes certain question which is considered to be true. If there are questions in more than one domain in the cultural context, there will be a possibility that the meaning here is referred to one cultural element of space.

Theme is an empirical indicator that is concluded by using the field data. After the researchers have got meanings that were grouped in themes, it is time to categorize themes into several concepts. Concept is the result of empirical theme that is containing information. In order to get concept, researcher identifies the theme upon the attribute. It is needed to find out the characteristic of theme and idea so that the thought that forms the background of theme is acquired.

Locus of Kampong Kauman (Kauman Village): Indonesia is a country where most of the populations are Muslim. They develop their own settlements scattering over cities and citys. Among those Muslim settlements, (*Kauman* community) is one of the interesting Muslim settlements that lies around the Masjid Agung (the Grand Mosque) in the city of Java. *Kampung Kauman* is dwelled by

a group of Muslim society bonded in kinship relationship. The dwellers actively execute the law of Islam and propagate the religion through the education of morality. Previously, Kampung *Kauman* of Semarang city (Figure 2) does not have an important role. The settlement has developed its role as part of important business sectors in Semarang. Kampung *Kauman* of Semarang is different from other Kampung *Kauman* in Java. The one in Semarang endures capital pressure from the central business district surrounding it. This phenomenon indicates social situation of Semarang *Kauman* Muslim settlement.

For the “Grand Tour”, the researcher is actively involved and fused in many activities of *Kauman* community; from one event of ceremony to another; from child religious activities to adult religious activities, as a way to get natural experiences toward the setting of space of *Kauman* Semarang.

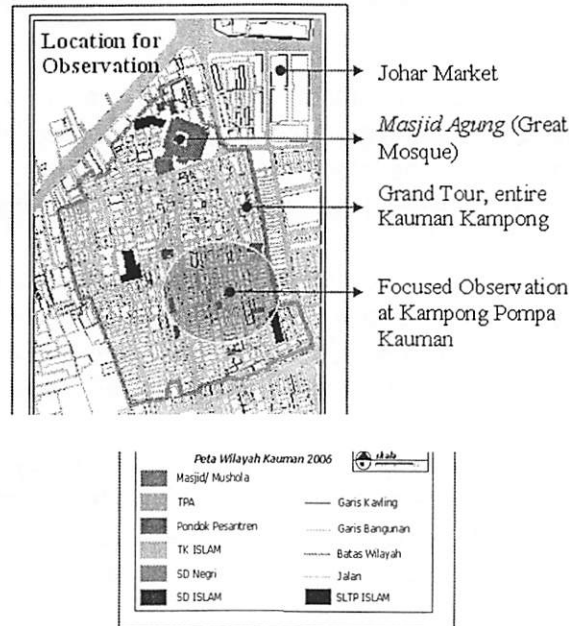


Fig. 2: The location for observation
Source: Suprpti,2010

SELF-CONSERVATION CONCEPT

More than three centuries, *Kauman* Semarang is considered as Muslim community. Two actors playing an important role in the life sustainability are clerics and traders. Both of them maintain the balance of the basic aspects of human needs such as socio-culture and economy. Some triggers, like capitalization-modernization pressures to the city center, multi ideological conditions existing in the modern city center, and multi-cultural local and coming from the outside, are a form of 'threat's for *Kauman* community. The pressure becomes primarily concern that will influence the ideology of the community. To prevent this, *Kauman* community conduct self conservation.

This community is awared that the most important thing as '*Kaumanese*' is when they are able to preserve and develop the cultural heritage carried out and developed by the previous generations. This matter is based on the self-concept of self which is local wisdom. The self- conservation concept consists of the following themes.

A. BUILDING OCCUPYING BY LOCAL BUSINESSMEN

Occupying of the building by a group of businessmen of *Kauman* is by buying the ownerships from the previous owners. This was considered as a measure to prevent the entry of external influences that are not in line with their ideology. Economically, this is done by them to protect and develop their business. The more they can develop their business, the more they can control the business, and thus providing economic benefits for them and the member of the community. When these local businessmen are able to invest more money in *Kauman*, it seems that capitalism is done the *Kauman* themselves.

Building occupying theme by businessmen is firstly triggered by the development of the first of businessmen of *Kauman*; secondly, it is triggered by weakening of the desire of some people to settle in *Kauman*; and thirdly, it is triggered by the idealism to protect themselves from outsiders coming into the *Kauman* area . in the space concept, it can be furthermore categorized into:

1. Businessmen purchasing the building and used as a home or place of business.
2. Businessmen purchasing the building for use as a dwelling house or place of business, and then the next after the time runs *wakaf* (something given by someone) buildings for religious activities are managed by the *Kauman*.
3. Businessmen purchasing the building for use as a residence or place of business and it's the same building also used to study the place.
4. Businessman accidentally buying the building to give it as *wakaf*.

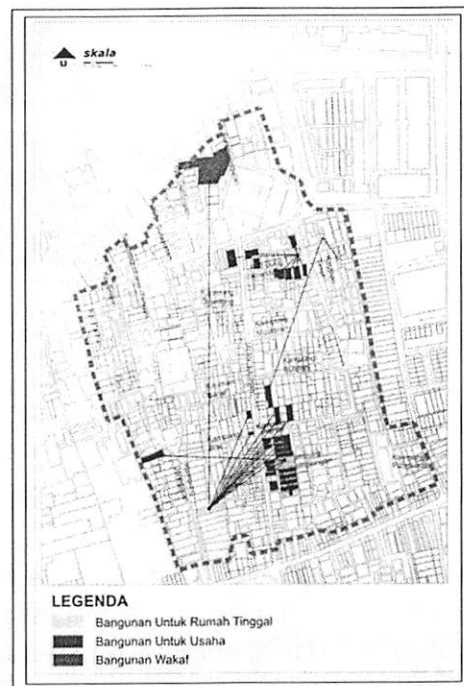


Figure 03 Mastery of Space By The Dealer In Semarang Kauman
Source: Suprpti,2010

Annexation of the building by local businessmen tends to cluster spatially. Rapi Store take control entrepreneur Store building in pompa villages, Glondong and Jonegaran. H. A take control Joseph Kemplongan buildings in the village, the village and in the Way Jonegaran Kauman. While employers Toha Putra Mosque master building around Gedhe Kauman, and village Krendo

This community performs celebration on important events to demonstrate the existence of the external world that *Kauman* communities still exist. In addition, it is intended to strengthen the social fabric that allows you to protect themselves against the effects of the entry of unwanted outsiders.

Of findings in the field of the theme of space-Celebration Celebrations for Self Existence can be classified into:

1. The carnival in *Kauman* , covering the main roads and highways in *Kauman* . This space is commonly used by the institutions to hold ritual procession Celebration. Carnival 'Khataman' (completed a course) from the Raudhatul Quran Islamic Childhood Education Center (TPARQ) is a tradition that is not only celebrated the victory of the students, but an attempt to revive the glory *Kauman* euphoria as a center of Islamic guidance. Procession around the *Kauman* village intended show to residents and surrounding *Kauman* off again TPARQ success of the students who have read through the Al-Quran, thereby strengthening the ranks 'guards of the Quran'. According to Maslow (1986), need for self-existence is the pinnacle of the hierarchy of needs psychology someone. The existence of self-fulfillment will demonstrate that self-perfection as a human being.

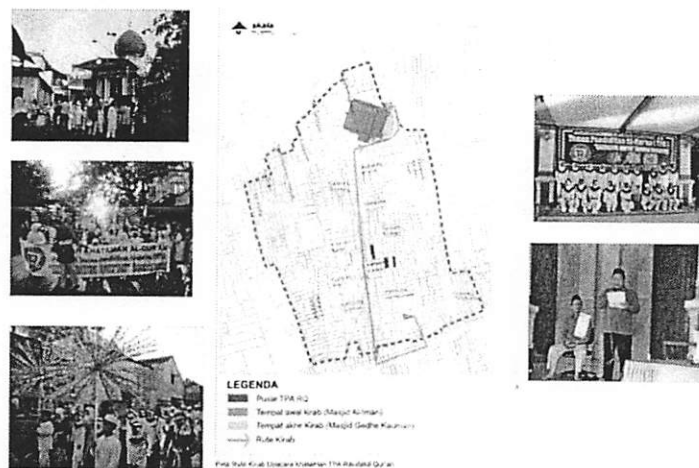


Figure 02 Graduation Celebration of Young Santri (Khataman)
Source: Suprapti,2010

Graduation celebration of the students are young (read through the Quran), as a symbol of youth off the fluent reading Qur'an. The event began with a procession around the village Kauman toward the Great Mosque. The event ended with a celebration of the delivery of a certificate to the effect from read through the Quran and handed back to the junior students.

2. Celebration takes place around the house *kyai*/ Islamic religious and education leader consisting of public spaces (roads, and open space) around *kyai's* house used for celebrations. For example is the Hafidz & Hafidhah celebration (passing students who can memorized Quran) at Raudhatul Qur'an Boarding School. The place is on the Way *Kauman* implementation or rather around Glondong village, shelter manager boarding school RQ. At such times *Kauman* roads are usually crowded by public transports, private and trade diverted. In this event, the organizers borrowed space from the neighbor for a preparation room and terraced houses of the residents to be the space of the invitation. Community by volunteering to lend, because for the sake of charity. It seems that cooperation between RQ and community of *Kauman* boarding school well established that this event was organized and had the full support from the citizens.

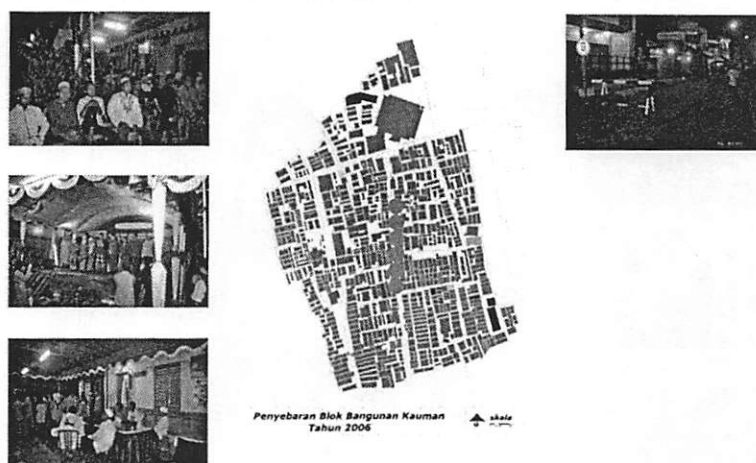


Figure 03 Graduation Celebration Hafidz Cottage Boarding Of Quran Audhatul
Source: Suprapti,2010

Graduation celebration Raudhatul Haafiz of Quran Boarding Schools, organized by taking up space on the road Kauman this event is a symbol of the existence of the reproductive Kauman Hafidz-hafidz (*kyai*) is a new and subsequent promotion to the outside world.

In *Kauman*, there are some elementary schools, such as: Sultan Agung Elementary school 01-03. *Sultan Agung* Elementary school 01-03 also holding a celebration anniversary days of Islam as Prophet Muhammad birthday by bringing clerics and provide *tausiyah* to students and teachers, in order to be spiritual refreshment. One of the celebrations organized by the school each year is the 'Echoes of Islamic Creativity' held around the month of prophet's birthday. This activity cannot be separated from the support fund of the big employers and people *Kauman* students. The purpose of this event is to promote this school, so it can be categorized as one of top schools in the Semarang.

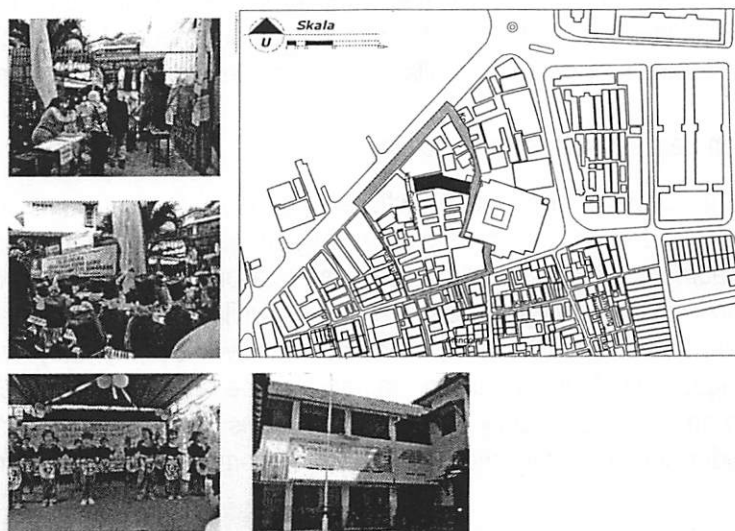


Figure 04 Islamic Art Gebyar celebration Organized SDI Sultan Agung 01-03 Every Month Maulud

Islamic Art celebration organized Islam Sultan Agung SD 01-03 Maulud every month. This is a symbol of the school's existence, as well as promotional efforts out.
Source: Suprapti,2010

3. Masjid Gedhe *Kauman / Kauman* Grand Mosque (MGK) as the center of the celebration. This mosque is the center of the oldest Islamic religious activities in the Semarang. Every event is being represented as the major days in Muslim community. One of the most festive events are organized by MGK is "Dugderan". This event is early introduced by the Duke Purbaningrat in 1881. The event was held to welcome the holy month of Ramadan. At this time, the celebration called Dugderan is

still conducted around MGK slightly enlivened with a small food bazaar and the sale of worship equipment.

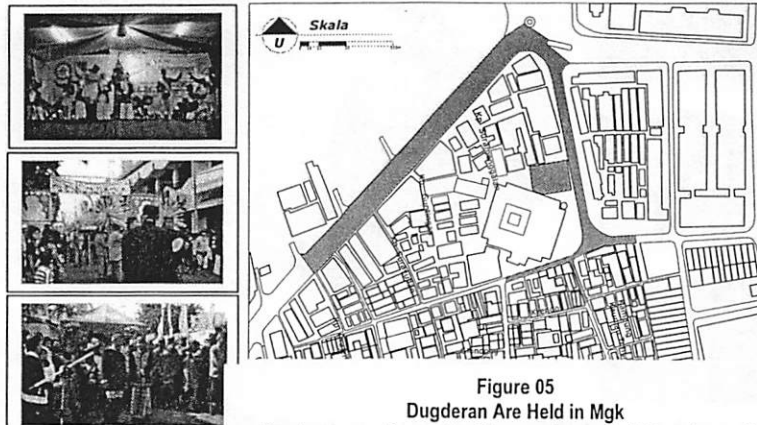


Figure 05
Dugderan Are Held in Mkg
 Dugderan event is a party of the people, was held to welcome the month of Ramadan. Occupy the open space around the mosque and the mosque as a center of activity.
 Source: Suprapti,2010

The celebration is used to demonstrate the identity of the *Kauman* people by doing thanksgiving that is called as a sign of the success of a particular achievement. For this citizen these activities actually have three meanings: (1) a sense of gratitude to God (2) as a form of religious broadcasting and as a manifestation and an expression of self-actualization.

B. KINSHIP SPACE

Kinship space is an area that is used by certain families to organize / foster family cultural traditions would thus strengthen the family ties. Kinship space usually consists of several houses occupied by several households that have the attachment of blood relationship. The buildings are clustered in one area / alley, so it seems the village is synonymous with a certain kinship.

The kinship space can be classified on the following:

1. Setting up a space for events or activities like *majlis taklim* (Islamic teaching activities) in order to continue teaching habit (*Mulang*) religious knowledge that is conducted by Islamic clerics. In *Kauman*, some *Kyais* who have close-relationship with other people in *Kauman*, are called *ustadz/ teachers*, they are active in MGK, while carrying out activities as a trader or businessman. Later, those *Kyais* build the community. Recently, they live in Pompa village, Butulan village, East *Kauman* village, and so on. The relatives of those *kyai* then conducted the learning group or community that is named *majlis taklim*. Later and later, *Majlis taklim* is being spreader and spreader, and eventually, it becomes the bigger community that is called *madrasah*.

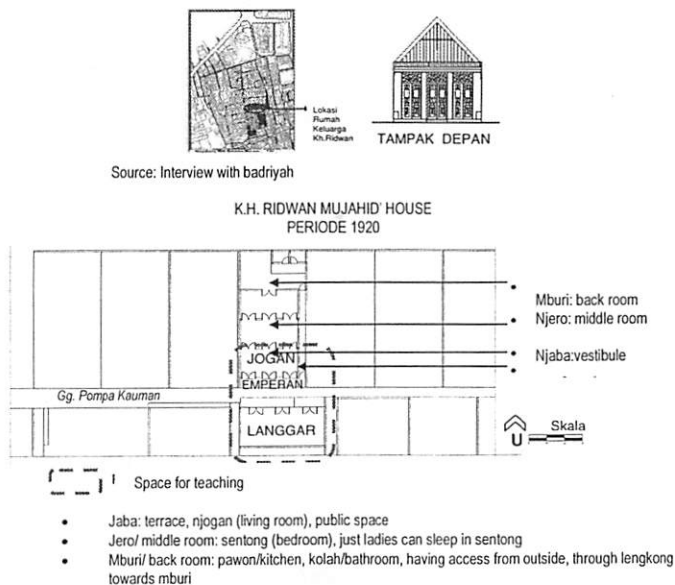


Figure 06
Reconstruction Room for Teaching Activities in K.H. Ridwan Mujahid's House, Pempa Village Semarang.

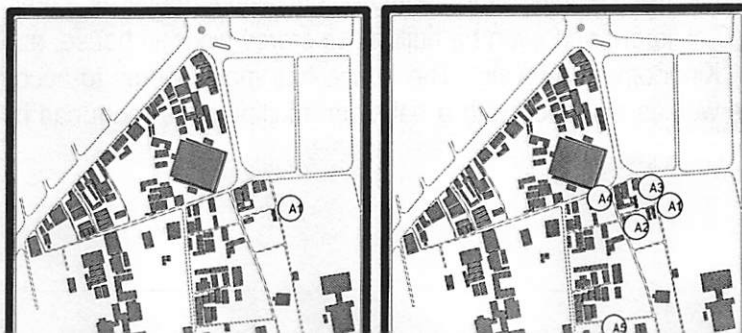
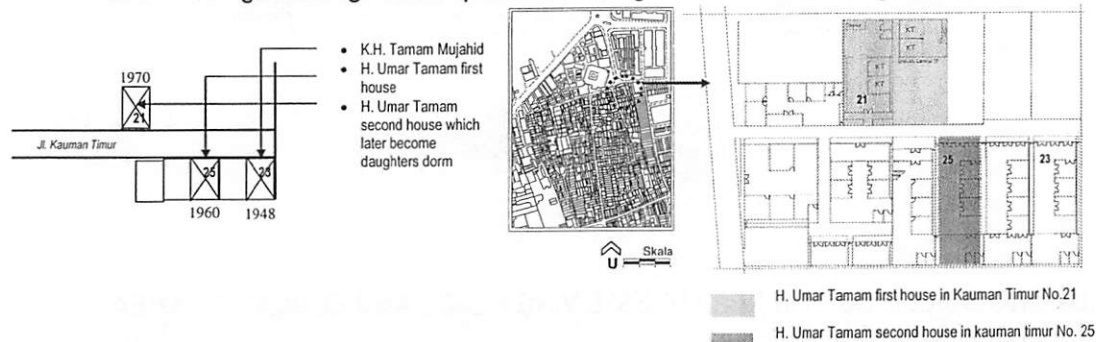
K.H. Ridwan Mujahid's house, since the Dutch have used to teach students. This is done in *njogan* (living room). K.H. Ridwan also teaches in front of the house. At the time, teach activities take place, the two spaces into one unit.

Source: Suprpti, 2010

2. WAKAF BUILDING FOR EDUCATIONAL ACTIVITIES RUN BY RELATIVES.

Ulama/ Islamic clerics have given their land in order to the people can build the Islamic educational institution on it. The reason is their relatives is considered as their inspiration. The other reasons are they want to create jobs like teacher (ustad) for their child. The agency subsequently received endowments from the surrounding community.

For H. Umar family, space has some meaning like: (a) a place which the people can make it for continuing cultural activities, which is set up and establish educational institutions that could benefit the Muslim community around it, (b) space also means a place which the people can considered it as place for teaching activities, (c) place which people can meet with extended family (relatives). This is a representation of Javanese philosophy: "*mikul duwur mendhem jero*". It means that the people should remember all of the good things of one person and forget all of the bad things about him/her



In the period 1920 and families ridwan Mujahid Mujahid Tamam started life residing in kauman

- Kyai ridwan mujahid select locations kauman pump
- Kyai Tamam Mujahid select a location east kauman

They chose a location close to the mosque so that they can prosper mosque

In this period developed a family of clerics mujahid kauman life lived in the village on the basis of considerations:

- Households (omah-omah)
- Teaching of religious knowledge
- Trade

Figure 07
The Family Room Kinship
K.H. Mujahid Kauman Period before Year 1965
Source: Suprpti,2010



- School which nurtured and established increasingly strong development on that time. Madrasah used as an alternative for junior school juniors because the amount was limited so the school is an option for locals kauman
- very large influence from Johar market → economy, rapi shops, Inns in Semarang
- madrasah schools retroactively → transferred to the government → location → building used to move other facilities → education
- Growing pangkuran school = elementary, junior and high school → shall compete with other schools (modern) alternative after the government generally
- growing trade with typical traditional / kauman

Figure 8
the Family Room Kinship
K.H. Mujahid Kauman Period 1966 – 2009
Source: Suprpti,2010

3. MANDATING BUILDINGS FOR RELATIVES' LIVING PLACE AND EDUCATION AREA.

Kyai Sahli (live at the beginning of the 20th century) had eight wives. Later, he build house for their wives and their 40 children, and even he built a two-storey wooden house, approximately 15 x 25 meters known as the 'Kingdom of Arba'ain'. The house has many rooms to accommodate his wives with their offspring, as well as equipped with a ballroom. Multipurpose room can be used for teaching

Quran, or hanging out with family, wives and 40 children.

Thus, the royal family live in harmony. These families also conduct economic activity, which is done by the women. They sold the traditional food from Semarang or Arab around the alley in front of 'the kingdom stage' usually called by people "Ratan cilik".

For *Kyai Sahli* and his family they apply Javanese philosophy of "*mangan ora mangan sing penting kumpul*". It means that they prefer meet and greet with all of the family even if without having no food/meal. Space also means the willingness to be able to share with other family members and the *Majlis Taklim* congregation founded by his ancestors, namely *Kyai Sahli*. Space also means the union between household's functions, economic functions, and religious functions.

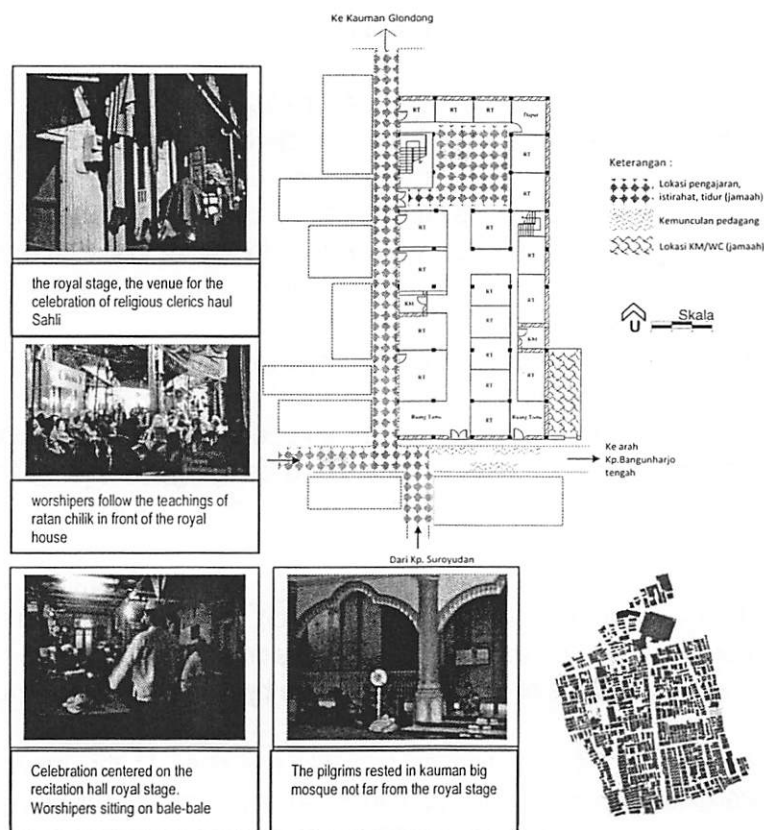


Figure 9 Home Place Royal For Celebration Operation Khol K.H. Sahli The To-71.

At The Core Of This Activity Occupies A Space That Is A Home Study Stage Kingdom, And Spilling Up To Ratan Little, Gang Glondong, Kauman Gedhe Mosque.

Source: Suprpti, 2010

According the explanation, it can be concluded that there is an understanding among the realtives. It means that there is a place to nurture family relationships and to continue the noble actions which is taken by their ancestors for the benefit of clerics and the relative interests of the Muslim community. And later, it could be the label theme maintaining kinship space.

Themes Space Celebration for Self Existence is a space that is used to carry the tradition which is associated with the celebration of cultural events. These events are mostly conducted by people in *Kauman* Semarang. This theme could in principle be classified into the following.

- (1) The use of lane main road for carnival activities
- (2) The use of public space around the location of the institution as the venue for the ceremony
- (3) The use of space Masjid Gedhe *Kauman* (*Kauman* Grand Mosque) as the venue for the ceremony

The theme of constructing relationship is involved in *guyub*. The people wanted to preserve traditional wisdom and habit. In the first theme, it is done from external factors, while the second and third themes to defend it internally. So that these three themes are included in the concept are: Conservation itself. Maintain Space Kinship is the independent variable, and Businessmens Building Ownership Mastering is also an independent variable, while Celebration for Self Existence is a variable that is affected.

The theme of maintaining kinship space influenced by "guyub" (peaceful) culture. Neighborhood is a gathering place for relatives, living side by side with friends, helping each other put the interests of the group rather than individual interests, mutual cooperation in the use of space, thus the warmth and comfort of residence can be obtained. The second factor is the kinship or blood relationship; it brought a sense of kinship and high solidarity.

The theme of occupying building businessmen is influenced by religious and cultural factors and economic factors. Muslims are taught to always keep the 'blessing' of a building, so as to transfer ownership of building there are separate procedures, namely the relative priority first, and then the neighbors around the house, and then to others. It is intended that the take over ownership of the building is really the chosen ones that can keep the blessing somewhere. Economic factors, on the one hand the buyer, feel forced by economic necessity so decided to sell the building, while the other side traders willing to expand space for business activities, and the two met on the transfer of ownership rights deal through buying and selling buildings.

Celebration Themes for the existence are influenced by the needs, kinship, and culture. The need for continue to uphold the existence of the self as a social creature who has the dignity of a class of clerics. Family clerics have children and relatives who developed largely, by conducting celebrations will be a binding for family members who have already grown up and gone somewhere with their own purposes. Islamic culture teaches culture to celebrate a victory, for commemorating, inspiring, and for religious broadcasting.

Conservation concepts are composed of elements, namely, the perpetrator space consisting of a merchant class and the *kyai* class, which holds the role of each. Traders step by increasing occupying of the building so as not to fall into the hands of others (outsiders *Kauman*), while the relative class clerics lend space for teaching activities of religious knowledge by preparing *kyai* to transfer knowledge to the pilgrims.

Self-concept in *Kauman* Conservation as superbly described in the previous section, are influenced by cultural-religious aspect, kinship, primary need, and kinship. This is reminiscent of the article Theory, Culture and Housing of Rapoport (2001) explaining that on one side of the culture - a way of life - the values - the norm - idealism - lifestyle, and on the other side of kinship - status & role - blood relation, together plays a role in the formation of the setting. In the case of *Kauman* Semarang, three factors-religious cultures, kinship, and the economy are equally important role in the formation of space setting.

Conservation Concept Self forming a spontaneous, unplanned. It functions as a space controller. These traits appear as an organic space (Koztof, 1991). Koztof said that the characteristic of the organic city is having functions that set one another so they need each other. The emergence of space businessmen spontaneously occupying the ownership of the building serves as a filter for the entry of the influences from outside to grow and thrive in *Kauman*. While the celebrations for the self-existence will strengthen social ties within ethnic groups that can be social value to unite the nation.

In occupying building by the businessmen theme, it seems that if the buildings are controlled by the businessmen, then it will abandon its traditional style and turn into modern style, as well as its function changed from living area to business area. It shows that capitalism does modernization of the characters this old local building. Internal capitalism is made by traders who are still considered relatives of *Kauman kyai*. At low levels, it will provide protection against the threat of entry for *Kauman* influences from the outside at *Kauman*, but at a high level, it will threaten the existence of the

community itself. It is happened because the character of modern business tends to erode the living space function thus threatening the characters of humanity and it will endanger the sustainability of community in *Kauman Semarang*.

CONCLUSION

Kauman people in Semarang are known as a Muslim tribes living around the city Grand Mosque. In Semarang, these people face modernization-capitalization pressures from the city center having a role as a central business district. Facing this pressure *Kauman* community has a local original thought to be sustainably survived with the concept of self conservation. Two 'space actors' having important role the existence of *Kauman* are businessmen and clerics. *Kauman* self-conservation concept was built by three themes, they are occupying of the building by a group of businessmen of *Kauman*, celebrations for its self-existence, maintaining kinship space.

Occupying of building by businessmen theme will influence the level of *Kauman* self-protection, while celebrations for its self-existence will give effect on the level ties of *Kauman* communities; and maintaining kinship space will influence both. If occupying of building by businessmen theme is conducted by a group of businessmen/merchants who are also the relatives of the clerics, the nature of self-protection will be strengthened. If this theme is increasingly conducted, then it would threaten the celebrations for its self-existence theme and will create a threat to the sustainability of *kauman* community in Semarang.

REFERENCES

- Atkinson, Paul, dkk. 2001, *Handbook of Ethnography*, London: Sage.
- Bennison, K, Amira dan Gascoigne, L, Alison, 2007, *Cities in the Pre-Modern Islamic World The urban impact of religion state and society*, New York, Routledge.
- Brenner, Robert. 2003, *Empire of Capital*, London: Verso.
- Budihardjo, Eko.2006. *Sejumlah Masalah Permukiman Kota*, Bandung: P.T. Alumni.
- Coban, James, L. 1971. *The City on Java: An Essay in Historical Geography*, University of California, Berkeley.
- Darban, Adaby A. 2000. *Sejarah Kauman: Menguak Identitas Kampung Muhammadiyah*, , Yogyakarta : Tarawang.
- Geertz, Clifford. 1986. *Mojokuto Dinamika Sosial Sebuah Kota di Jawa*, Jakarta: PT Temprint.
- _____.1992. *Tafsir Kebudayaan Terjemahan dari buku The Interpretation of Cultures: Selected Essays*, , Yogyakarta: Kanisius.
- _____.1989. *Abangan, Santri, Priyayi Dalam Masyarakat Jawa*, Jakarta: Pustaka Jaya.
- Groat, Linda and Wang David. 2002. *Architectural Reseach Methods*, New York: John Wiley & Sons Inc.
- Hayden, Dolores. 1995. *The Power of Place*, London; Thames Hudson Ltd.
- Hillier, Bill; Hanson, Julienne & Peponis, John. 1987. *Architecture & Comportement Architecture & Behaviour*, Vol. 3 (1986-1987), Lausanne Switzerland
- Hornby, F, William. *An Introduction to Settlement Geography*, Cambridge: University Press.
- Iman, Aseem. 2002. *Meaningful Urban Design: Teleological/ Catalytic/Relevant*, Journal of Urban Design. Vol. 7, No.1, UK: Carfax Publishing.
- Koztof, Spiro. 1991. *The City Shaped*, London: Thames Hudson Ltd.
- Lefebvre, Henri. 1998. *The Production of Space*, Blackwell Oxford UK & Cambridge USA.
- Lexy, J., Moleong. 1996. *Metodologi Penelitian Kualitatif*, Bandung: PT Remaja Posdakarya.

- Lombard, Dennys. 2005 a. *Nusa Jawa: Silang Budaya, Kajian Sejarah Terpadu, Bagian I: Batas-Batas Pembaratan*, Jakarta-Paris: PT Gramedia Pustaka Utama.
- _____. 2005 b. *Nusa Jawa: Silang Budaya, Kajian Sejarah Terpadu, Bagian II: Jaringan Asia*, Jakarta-Paris : PT Gramedia Pustaka Utama.
- _____. 2005 c. *Nusa Jawa: Silang Budaya, Kajian Sejarah Terpadu, Bagian III: Warisan Kerajaan-Kerajaan Konsentris*, Jakarta-Paris: PT Gramedia Pustaka Utama.
- Lynch, Kevin. 1981. *Good City Form*, USA: MIT Press
- _____. 1990. *City Sense City Design*, London, USA: MIT Press.
- Madanipour, Ali. 2007, *Designing the City of Reason: Foundation and Frameworks*, London and New York: Routledge.
- Maslow, H., Abraham, 1986. *Farther Reaches of Human Nature*. New York: Orbis Book
- Marwoto. 2001. *Tesis: Kampung Kauman di Pesisir Utara Jawa Tengah Kasus Studi: Kauman Jepara, Kauman Kudus Wetan dan Kauman Pati*, Bandung: Program Magister Arsitektur, Institut Teknologi.
- Muhadjir, Noeng. 2007, *Metodologi Keilmuan Paradigma Kualitatif, Kuantitatif, dan Mixed Edisi V*, Yogyakarta : Rake Sarasin.
- Mulyati, Ahda, 1995. *Pola Kampung Kauman Yogyakarta*, Thesis, Yogyakarta: Universitas Gajahmada Yogyakarta.
- Nas, M.J. Peter. 1986. *The Indonesian City Studies in Urban Development and Planning*, Netherlands: Foris Publication.
- _____. 2009. *Masa Lalu Dalam Masa Kini Arsitektur di Indonesia*, Jakarta: Gramedia Pustaka Utama.
- Pangarsa, Widjil, Galih. 2006. *Merah Putih Arsitektur Nusantara*, Yogyakarta: Andi Offset.
- Prijotomo, Josef. 1992. *Ideas and Forms of Javanese Architecture*, Yogyakarta: Gajah Mada University Press.
- Rapoport, Amos. 1969. *House Form and Culture*, Prentice-Hall, Inc.Englewood Clifff, N.J New York: Pargamon Press.
- _____. 1977. *Human Aspect of Urban Form*, New York: Pargamon Press.
- _____. 1983. *The Meaning of the Built Environment a Nonverbal Communication Approach*, Beverly Hills California: Sage Publications.
- _____. 2005. *Theory Social and Culture*, Tylor and Francis Metapress Culture, Architecture and Design.
- Sadali, Ahmad. 1980. *In Search of an Islam-Initiated Architectural Identity in Indonesia. In Architecture as Symbol and Self-Identity. Jonathan G. Katz (ed)*. Philadelphia: Aga Khan Award for Architecture.
- Satwiko, Prasasto, 2004. *Traditional Javanesse Architecture and Thermal Comfort*, Yogyakarta : Universitas AtmaJaya Yogyakarta.
- Sensa, Muhammad, S, Djarot. 1981. *Sebuah Pemikiran Tentang Permukiman Islam*, Bandung: MITP UNISBA.
- Schoorl. JW. 1981. *Modernisasi*, Jakarta: PT Gramedia Indonesia.
- Serageldin, B. 2001. *The Sacred City*, New York: Routledge.
- Spradley, P, James. 1997. *Mengamati Sambil Ikut Serta Metoda Observasi Partisipatif*, Yogyakarta : Pusat Pastoral.
- _____. 1997. *Memahami Cara Hidup Orang Lain Memperkenalkan Ilmu Etnografi*, Yogyakarta :

Pusat Pastoral.

- _____.2007. *Metode Etnografi*, Yogyakarta : Tiara Kencana.
- Suprapti, Atiek. 1997. *Kajian Pola Spasial Kampung Kauman Semarang Sebagai suatu 'Place'*, , Semarang : Tesis Magister Teknik Arsitektur UNDIP.
- B., Suprapti, Atiek; Budihardjo, Eko; Kistanto, H., Nurdien; Tungka, E., Aristotulus. 2010. *Ethnography-Architecture in Kampong Kauman Semarang: A Comprehension of Cultural toward Space*. American Journal of Engineering and Applied Sciences. Vol. 3 Issue 3, New York: Science Publication.
- Tetuko Sidem. 2000. *Tesis: Kajian Karakteristik Pola Permukiman Islam di Kauman Demak*, Semarang : Program Pasca Sarjana Magister Teknik Arsitektur Universitas Diponegoro.
- Tillema,H,F. 1913. *Van Wonen en Bewonen, van Bouwen, Huis en Erf Tjandi-Semarang*.
- Tjandrasasmita, Uka. 2000. *Pertumbuhan dan Perkembangan Kota-kota Muslim di Indonesia*, Kudus: Penerbit Menara Kudus.
- Trancik, Roger. 1986. *Finding The Lost Space: Theories of Urban Design*, New York: Van Norstrand Reinhold Company.
- Triatmojo, Suastiwi. 2010, *Pemupakatan dan Desakralisasi Ruang Di Permukiman Kauman*, Disertasi, Yogyakarta, Yogyakarta: Universitas Gajahmada Yogyakarta.
- Tuan, Yi-Fu. 2008, *Space and Place: The Perspective of Experience*, London: University of Minnesota Press.
- Wijanarka. 2007. *Semarang Tempo Dulu Teori Desain Kawasan Bersejarah*, Yogyakarta: Ombak.
- Wiryotomo, P.B.A. 1995. *Seni Bangunan dan Seni Binakota di Indonesia*, Jakarta: PT Gramedia Pustaka Utama.
- Yunus, Sabari, Hadi. 2005. *Struktur Tata Ruang Kota*, Yogyakarta: Yogyakarta Pustaka Pelajar.
2008. *Proceedings of NURI International Symposium, Brastagi-North Sumatra: Architecture, development and urbanization toward sustainable cities in nusantara*, Edited oleh Bhakti Alamsyah, dkk, Medan: Nuri press.
2001. *Handbook of Fthnography*, Edited oleh Paul Atkinson, dkk, London: Sage.
2010. *Proceddings 1st International Conference on Sustainable Architecture and Urban Design, ICSAUD*, Penang. Malaysia: School of Housing, Building & Planning.

TRENDS OF TERRACED HOUSE MODIFICATION: A CASE STUDY IN TAMAN SRI CEMPAKA, MELAKA TENGAH

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ABSTRACT

Home modification has become a trend in recent years especially the terraced houses in Malaysia. Strict rules and regulation does not stop homeowners from modifying their houses according to their own desire. As a result, it disrupts the initial standard repetitive design of the terraced houses. This paper presents findings of a study on the terraced house modification of forty-six houses by homeowners in Taman Sri Cempaka, Melaka Tengah. Several inputs of modified spaces and features were collected and analysed. The purpose is to identify the modification outcome, the factors influencing and the relationship between the outcome and the factors of terraced house modification. The findings indicate that the homeowners tend to modify their houses because of the need of space. The changes also include the feature and the material of the house. The study suggests that the homeowners depend on economy, comfortability, necessity, psychology and aesthetic as determinants to modify their houses.

Key Words: *Modification, Terraced House, Changes in design*

INTRODUCTION

Terraced houses were adopted from the British terraced house design which is also known as "row house" in some countries (Hashim, Rahim, Rashid & Yahaya, 2006). Commonly, terraced house is comparatively narrow and deep with fenestration at the front and rear (Chandler et al., 2005). Typical layout features repetitive and monotonous designs consisting of rows of rectangular housing lot where boundaries are specified clearly by using linked fenced or brick perimeter wall. (Chandler et al., 2005)

The downside of mass houses are often designed for a typical user, with average abilities in mind for the average needs of today, without taking account the future changes of the user (Baldwin and Tomita 2007) and constantly, the housing design is the lack of social and cultural considerations and insensitive to local context (Parva and Dola, 2007; Hashim et al. 2009). Adaptation of aspirations or adaptation of the present house through modification or relocation is caused by irregularities between the present house and the residents' needs, preference and aspiration (Baum and Hassan 1999). On the other hand, Tipple (1996) argued that housing transformation could contribute to sustainable development in the urban and rural environments. Moreover, to develop households' affection towards their houses, he targeted on architectural opportunities in terms that housing transformation which concerns residents in their houses. Therefore, the sense of belonging is improved in transformed houses and the residents of such houses have better feelings when living in their houses (Tipple, 1996)

According to Oulasvirta & Blom (2008), decorating or beautifying, altering, modifying and adapting abnormal behaviours in human activity in the act of personalization. Personalization is when there is any modification or addition to the exterior part of the house by the residents, including the garage and the front or back yard (Marcus & Sarkissian, 1986). Some people modify their houses to gain financial benefits or merely to decorate and make their house "stylish" (Abbott et al. 2003).

Changes and modification to the residents' houses are often irreversible, evident, and conflicting with the building's unity and incompatible with the façade treatments (Giullani&Bucchignani 2000).

LITERATURE REVIEW

Modification as a necessity

Terraced house modification is common in the Malaysian culture, even until today. (Department of Housing, 2004 in Rahim &Hashim, 2012). Behavioural adaptation process in low cost terrace housing causes some aspects of the Malay culture to vanish or adapted at least until housing modification can be afforded. (Zaiton& Ahmad Hariza, 2006)

Psychology reasons

A number of authors have suggested, in order to communicate aspects of self to others, people may, consciously or otherwise, modify their home environment. (E.g. Rapoport, 1989; Nasar, 1989; Dittmar, 1992a; Marcus, 1995). Marcus (1995) who was particularly influenced by the work of Carl Jung, stated that housing may express unconscious needs and desires, taking into consideration "depth psychology" approach and drawing on examples from dreams and literature. Becker, 1977 concludes that the home is commonly used to define and express the self after reviewed much architectural and social science literature. Csikszentmihalyi and Rochberg-Halton (1981) collected data which suggests that houses and the objects within them have social and psychological functions.

Aesthetic reasons

Cooper Marcus (1995) suggests that housing choice is conducted by practical and symbolic factors. It is important that the house expresses the social identity that a person wants to convey to others. It may be hypothesised that the way in which a house has been modified, decorated and furnished may indicate both the existent social position of a person, as well as desired group membership, or social identity. For example, a person may desire membership to a new group, therefore he or she may begin to alter his or her home in order to demonstrate the perceived character, tastes and interests of members of that group.

Economic reasons

Furby (1978) indicates that possessions give us control over the environment and other person which is a popular approach to the meaning of possessions. Dittmar (1992a) argues that even though many possessions have practical or functional significance, they also have symbolic value. They can be "status symbols" and reflect financial success, and they can demonstrate a person's values, interests and beliefs. Belk (1988) considered houses in his viewpoint as he described possessions as extensions of the self.

Comfortability reasons

Hanna and Lindamood (1981) found that with something as complex as a house, it is possible for residents to be displeased with some of the specific features yet be generally satisfied. Generally, residential alterations are to improve the housing and therefore gain satisfaction. So, the relationship of satisfaction to residential alterations is not clear (Seek, 1983). Bross(1975) however, found that alterations did not increase satisfaction, and Harris (1976) found a negative relationship between

satisfaction and alterations. Parrott (1986) found that the greatest increase in satisfaction after residential alterations was in those households who had already indicated a basic satisfaction with their housing.

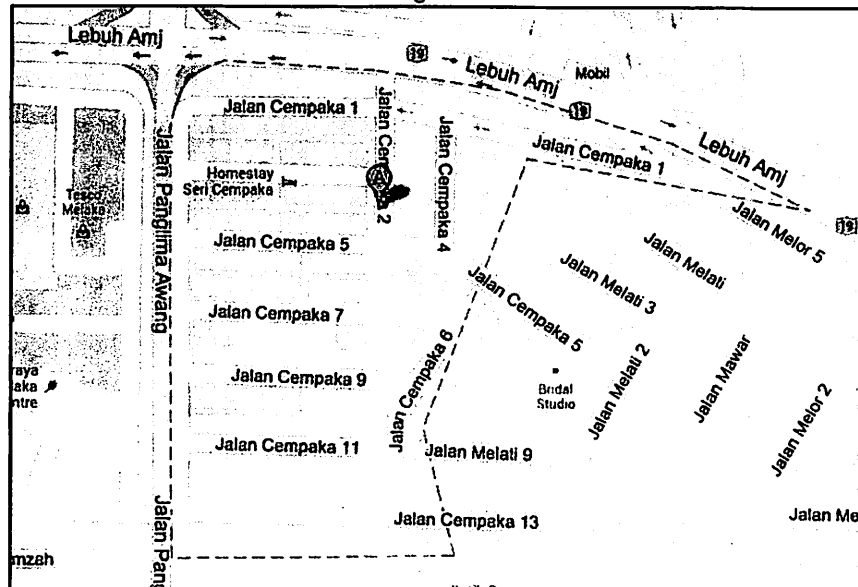
THEORETICAL FRAMEWORK

In the sociological model of human behaviour, people seek respect from self and others. The Morris and Winter theory claims that if a household believes that its housing is below the norms of the society (a threat to respect), that household will feel dissatisfied and seek to change its situation – the theory of housing adjustment in which is suitable in this study. Major components of the housing adjustment theory define housing norms, constraints that affect the household's ability to act, indene housing norms, constraints that affect the household's ability to act, and resulting housing decisions and behaviors. When the household recognizes a housing deficit, possible corrective measures include: (a) housing adjustment, such as moving to a different dwelling or altering the current house; (b) housing adaptation, in which the household itself makes changes such as reducing needs, removing constraints, or re-allocating current resources (Sherman & Combs, 1997); and (c) regeneration, which could include the disintegration and reorganization of the household or in social action focused on reorganization of the society (Varody& Walker, 1999) resulting housing decisions and behaviours. When the household recognizes a housing deficit, possible corrective measures include: (a) housing adjustment, such as moving to a different dwelling or altering the current house; (b) housing adaptation, in which the household itself makes changes such as reducing needs, removing constraints, or re-allocating current resources (Sherman & Combs, 1997); and (c) regeneration, which could include the disintegration and reorganization of the household or in social action focused on reorganization of the society (Varody& Walker, 1999).

METHODOLOGY

The double storey terraced houses comprised the majority of house type built and the most popular form landed property in the country. The purpose of this study is to identify the modification outcome, the factors influencing and the relationship between the outcome and the factors of terraced house modification. Forty six samples were selected from a developed urban housing development in Taman Sri Cempaka, Melaka Tengah. As only homeowners may make physical modification to the house, owner-occupied properties were preferred (Marcus & Sarkissian, 1986), if the modified house is a rental property; the information of the house was acquired using the information given by the tenant. The houses were selected through observation which has been made by the researcher to select the houses that has been modified. Owner-occupied houses will allow the researcher to observe the physical trace and study how the spaces in the homes were used. Another important selection criterion is that the property must have been modified or renovated. Unmodified homes were filtered out by observation. It was decided that the best method for this study was observation and informal interview. A standardized format sheet was devised to record the observation process. It covers various attributes of the house ranging from spatial modification, materials and features modification. Informal interview was found to be very informative as the homeowner will not only give a brief history and descriptions of the modifications but also give glimpse into their life, how family activities are carried out and how do they attend to the guest. The descriptions were all digitally recorded to assist the researcher in analysis. Photographs of any physical changes made to the home were also taken whenever allowed.

Figure 1



Taman Seri Cempaka housing area. Source: Google Map

HOUSING AREA CHARACTERISTICS

Taman Seri Cempaka housing was constructed in 1993. It is geographically located at latitude (2.2175 degrees) 2° 13' 2" North of the Equator and longitude (102.2493 degrees) 102° 14' 57" East of the Prime Meridian on the Map of Malacca - Melaka. Taman Sri Cempaka was developed by PERTAM (*Perbadanan Kemajuan Tanah Adat Melaka*). The architect firm responsible for this project is Akitek Ismail Othman. Since the construction was done on a Malay reserved land or *Tanah Adat*, Majority of the homeowners are Malay. The following are background information attained by surveys and informal interviews.

Table 1

Profile	Mean / Average
Number of household	4.70
Household income (RM)	4663.04
Number of children	6.74
Number of years residing	7
Number of vehicles	2.37

The average number of resident's profile according to the study in Taman Seri Cempaka

Table 2

Race	Frequency	Percentage %
Malay	42	91.3
Chinese	4	8.7
Indian	-	-
Floor plan status awareness	Frequency	Percentage %
Yes	37	80.4
No	4	8.7
Uncertain	5	10.9

The frequency and percentage of race and awareness towards the rules and regulations in Taman Seri Cempaka

**ANALYSIS RESULT
REASONS FOR MODIFICATION**

Table 3

Economically	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. I modify my house because I have my own / family savings for home modification.	0 (0)	1 (2.2)	9 (19.6)	26 (56.5%)	10 (21.7)	3.98
2. I modify my house because I have approval for bank loans	9 (19.6)	7 (15.2)	12 (26.1%)	10 (21.7)	8 (17.4)	3.02
3. I modify my house because I have received government loan	14 (30.4)	7 (15.2)	10 (21.7)	8 (17.4)	7 (15.2)	2.72
4. I modify my house because it is better and cheaper than buying a brand new house.	4 (8.7%)	6 (13.0)	9 (19.6)	18 (39.1)	9 (19.6)	3.48

Reasons for modification in terms of Economy

The mean values are according to the Likert Scale which is rated (1) for Not at all, (2) for Very Little, (3) Uncertain, (4) Moderately and (5) Mainly. Based on the value of mean in Table 3, respondents chose items 1 and 4 as the prime reason for modification after the house is constructed. The highest value of mean is 3.98, followed by 3.48. Most houses are modified using the homeowners own savings and according to the homeowners, modifying their houses is cheaper than buying a new one.

Table 4

Aesthetically	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. I modified my house to obtain a better and beautiful façade	0 (0)	2 (4.3)	8 (17.4)	21 (45.7)	15 (32.6)	4.07
2. I did not modify my house in order to maintain the standard repetitive design	11 (23.9)	6 (13)	13 (28.3)	10 (21.7)	6 (13)	2.87
3. I modify my house to obtain comfortability and uniqueness of the interior design	1 (2.2)	1 (2.2)	8 (17.4)	19 (41.3)	17 (37)	4.09
4. House modification is essential for me because the original design is inappropriate	2 (4.3)	6 (13)	16 (34.8)	13 (28.3)	9 (19.6)	3.46
5. I modified my house to express my individuality and personality	6 (13)	2 (4.3)	18 (39.1)	14 (30.4)	6 (13)	3.26

Reasons for modification in terms of Aesthetic

Based on the value of mean in Table 4, respondents chose items 1 and 3 as the prime reason for modification after the house is constructed. The value highest of mean is 4.09 and 4.07 respectively. Aesthetically, the homeowners modified their houses mainly because the need to achieve comfort.

Table 5

Psychologically	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. I modified my house because I was influenced by the surrounding, (the houses in the neighbourhood had changed as well)	9 (19.6)	9 (19.6)	15 (32.6)	11 (23.9)	2 (4.3)	2.74
2. I modified my house because I had no choice (I did not want to move because I am attached to the house)	2 (4.3)	7 (15.2)	19 (41.3)	6 (13)	12 (26.1)	3.41
3. I modified my house because I am well aware of the regulations set by the authorities regarding house modification	0 (0)	3 (6.5)	14 (30.4)	12 (26.1)	17 (37)	3.93
4. I modified my house because I support housing modification and renovation	0 (0)	1 (2.2)	17 (37)	16 (34.8)	12 (26.1)	3.85
5. I modified my house to indicate my status in the community	12 (26.1)	9 (19.6)	17 (37)	5 (10.9)	3 (6.5)	2.52

Reasons for modification in terms of Psychology

Based on the value of mean in Table 5, respondents chose items 3 and 4 as the prime reason for modification after the house is constructed. The value of mean is 3.93 and 3.85 respectively. Psychologically, the homeowners are clearly attached to their houses. According to the table above, the highest frequency score for research question number 2 are 19 (41.3%) for being uncertain whether to modify or move to a new house.

Table 6

Necessity	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. I modified my house to maintain the house and to avoid obsolescent	1 (2.2)	4 (8.7)	4 (8.7)	18 (39.1)	19 (41.3)	4.09
2. I modified my house to cater for the growing number of household	2 (4.3)	2 (4.3)	8 (17.4)	19 (41.3)	15 (32.6)	3.93
3. I modified my house to expand certain spaces in my house	0 (0)	0 (0)	7 (15.2)	20 (43.5)	19 (41.3)	4.26
4. I modified my house to eliminate certain spaces in my house	7 (15.2)	5 (10.9)	13 (28.3)	12 (26.1)	9 (19.6)	3.24
5. I modified my house to divide certain spaces in my house	1 (2.2)	3 (6.5)	7 (15.2)	19 (41.3)	16 (34.8)	4.00
6. I modified my house to extend certain areas	1 (2.2)	0 (0)	6 (13.0)	22 (47.8)	17 (37)	4.17
7. I modified my house to rearrange certain spaces in my house	1 (2.2)	3 (6.5)	8 (17.4)	23 (50)	11 (23.9)	3.87
8. I modified my house to fulfill religious aspect and culture of my household	2 (4.3)	3 (6.5)	20 (43.5)	13 (28.3)	8 (17.4)	3.48

Reasons for modification in terms of Psychology

Based on the value of mean in Table 6, respondents chose items 1, 3, 5 and 6 as the prime reason for modification after the house is constructed. The value of mean is 4.09, 4.26, 4.00 and 4.17 respectively. It can be concluded that residents in Taman Sri Cempaka modifies their houses to avoid

obsolescent, to expand certain spaces in the house, to divide certain spaces in the house and to extend certain areas in the house. This finding suggests that residents acquire more space rather than to fulfill any other necessity in their home modification with 43.5%.

Table 7

Comfortability (Quantity)	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. The number of bedrooms in my house is sufficient	5 (10.9)	10 (21.7)	2 (4.3)	22 (47.8)	7 (15.2)	3.35
2. The number of bathrooms and toilets in my house is sufficient	8 (17.4)	10 (21.7)	0 (0)	20 (43.5)	8 (17.4)	3.22
3. The number of stores / utility rooms in my house is sufficient	6 (13)	11 (23.9)	3 (6.5)	22 (47.8)	4 (8.7)	3.15
4. The number of guest rooms in my house is sufficient	5 (10.9)	8 (17.4)	4 (8.7)	25 (54.3)	4 (8.7)	3.33

Reasons for modification in terms of Comfortability (Quantity)

Based on the value of mean, the highest value is 3.35 with 47.8% of the respondents agrees with the number of bedrooms in the house. This finding indicates that the residents are quite satisfied with the number of bedrooms in Taman Sri Cempaka Housing area. Upon observation, the researcher finds that there are 3 bedrooms and 2 bathrooms in one house.

Table 8

Comfortability (Width)	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. The width of bedrooms in my house is appropriate	5 (10.9)	9 (19.6)	5 (10.9)	21 (45.7)	6 (13)	3.30
2. The width of living room in my house is appropriate	3 (6.5)	10 (21.7)	3 (6.5)	25 (54.3)	5 (10.9)	3.41
3. The width of dining room in my house is appropriate	4 (8.7)	12 (26.1)	2 (4.3)	25 (54.3)	3 (6.7)	3.24
4. The width of kitchen in my house is appropriate	8 (17.4)	15 (32.6)	3 (6.5)	17 (37)	3 (6.5)	2.83
5. The width of bathrooms and toilet in my house is appropriate	7 (15.2)	12 (26.1)	4 (8.7)	19 (41.3)	4 (8.7)	3.02
6. The width of guest room in my house is appropriate	4 (8.7)	9 (19.6)	6 (13)	21 (45.7)	6 (13)	3.35
7. The width of balcony in my house is appropriate	2 (4.3)	9 (19.6)	11 (23.9)	19 (41.3)	5 (10.9)	3.35
8. The width of car porch in my house is appropriate	14 (30.4)	9 (19.6)	3 (6.5)	17 (37)	3 (6.5)	2.70
9. The width of store and utility room in my house is appropriate	7 (15.2)	5 (10.9)	11 (23.9)	20 (43.5)	3 (6.5)	3.15

Reasons for modification in terms of Comfortability (Width)

Based on table above, majority of the respondents chose (4) – Agree on comfortability of certain space in the house in terms of width. However the respondents chose item 8 with the value of mean 2.70 as they disagree with the size of their car porch since the average number of vehicles owned by the respondents in Taman Sri Cempaka is 2.37. (See table 1). The car porch however, fits only 1

vehicle.

Table 9

Comfortability (Adaptability)	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. I convert my guest room into my children's bedroom	11 (23.9)	6 (13)	11 (23.9)	15 (32.6)	3 (6.5)	2.85
2. I use the living room as the guest's sleeping area and my children's sleeping area	10 (21.7)	10 (21.7)	10 (21.7)	14 (30.4)	2 (4.3)	2.74
3. I use the utility room as the guest's sleeping area and my children's sleeping area	11 (23.9)	13 (28.3)	14 (30.4)	8 (17.4)	0 (0)	2.41

Reasons for modification in terms of Comfortability (Adaptability)

Based on the value of mean, there are no items chosen by respondents as the prime reason for modification after the house is constructed. According to the mean score in table 9, which is 2.85, 2.74 and 2.41 for item 1, 2 and 3, majority of the respondents are whether uncertain or disagree with the comfortability in their houses. As an alternative from lack of space, using the living room as a sleeping area is quite common in Taman Sri Cempaka household with 30.4% of the respondents agree with item 2.

MODIFICATION OUTCOME

In Terms of Space

Table 10

Space	Not At All	Very Little	Uncertain	Moderately	Mainly	Mean Score
	Percentage %					
Master Bedroom	13	8.7	0	28.3	50	3.93
Bedroom	15.2	6.5	4.3	43.5	30.4	3.67
Kitchen	8.7	2.2	10.9	43.5	34.8	3.93
Living Room	10.9	4.3	8.7	43.5	32.6	3.83
Dining Room	15.2	13	15.2	41.3	15.2	3.28
Family Area	17.4	10.9	10.9	43.5	17.4	3.33
Terrace	23.9	8.7	26.1	30.4	10.9	2.96
Balcony	34.8	13	13	28.3	10.9	2.08
Bathrooms	10.9	10.9	17.4	27.6	26.1	3.54
Car Porch	10.9	2.2	6.5	45.7	34.8	3.91
Store	32.6	13	17.4	28.3	8.7	2.67
Guest Room	23.9	13	17.4	34.8	10.9	2.96
Maid's Room	30.4	13	26.1	26.1	4.3	2.61
Front Lawn	8.7	15.2	6.5	50	19.6	3.57
Backyard	15.2	6.5	8.7	54.3	15.2	3.48

Percentage of modifications in terms of space carried out in 46 houses in Taman Sri Cempaka housing area.

The mean values are according to the Likert Scale which is rated (1) for Not at all, (2) for Very Little, (3) Uncertain, (4) Moderately and (5) Mainly. Mean which is the quotient of the sum of several quantities and their number; or widely known as an average. Table 10 depicts the average score for the questionnaire question – *How do you assess the level of changes in terms of space in your house?* Findings in table 10 indicates that majority of the respondents modified their houses moderately in majority of the space in their house which includes Bedrooms, Kitchen, Living Room, Dining Room, Family Area, Terrace, Bathrooms, Porch, Guest Room, Front yard and Back Yard. However, 50% of the respondents modified their Master Bedrooms mainly. The other remaining space – Balcony (34.8%), Storage / Utility Room (32.6%) and Maid’s Room (50.4%) mean value scored low as the least amount of modification done in the area. The Maid’s Room however are not common in the housing area, the respondents interprets all the sleeping room as bedrooms which indicates the low score mean value on Maid’s Room.

In Terms of Materials

Table 11

Materials	Not At All	Very Little	Uncertain	Moderately	Mainly	Mean
	Percentage %					
Roof Frame	28.3	13	17.4	34.8	6.5	2.78
Roof Tiles	28.3	10.9	19.6	34.8	6.5	2.80
Paint	4.3	2.2	15.2	43.5	34.8	4.02
Wall Tiles	8.7	6.5	15.2	54.3	15.2	3.61
Door Openings	8.7	6.5	6.5	56.5	21.7	3.76
Window Openings	10.9	8.7	13	45.7	21.7	3.59
Drain & Gutter	23.9	19.6	15.2	34.8	6.5	2.80
Staircase	19.6	10.9	17.4	32.6	19.6	3.22
Floor	6.5	6.5	8.7	67.4	10.9	3.70
Ceiling	10.9	6.5	10.9	54.3	17.4	3.61
Railing	17.4	6.5	10.9	50	15.2	3.39

Percentage of modifications in terms of materials carried out in 46 houses in Taman Sri Cempaka housing area.

Table 11 depicts the average score for the questionnaire question – *How do you assess the level of changes in terms of material in your house?* Majority of the respondents modify the materials in their houses moderately with the highest score of mean value 4.02 which is the change of paint colour and the highest score of the moderately modified space in the house is the floor with 67.4%.

Table 12

	Frequency Score (%)					Mean Score
	1	2	3	4	5	
1. I might renovate my house again in the future	3 (6.5)	3 (6.5)	4 (8.7)	22 (47.8)	14 (30.4)	3.89
2. After my home modification, it has accommodate my household	0 (0)	1 (2.2)	3 (6.5)	30 (65.2)	12 (26.1)	4.15
3. House modification is essential because the former design of my house is	1 (2.2)	9 (19.6)	6 (13)	17 (37)	13 (28.3)	3.70

inappropriate						
4. House modification is essential to reflect my taste on aesthetical design	1 (2.2)	5 (10.9)	6 (13)	23 (50)	11 (23.9)	3.83
5. I am satisfied with the outcome after the house modification	0 (0)	2 (4.3)	5 (10.9)	21 (45.7)	18 (39.1)	4.20

Perception of Modification Outcome

Table 12 explains perception of modification outcome after the renovation or modification is completed. The findings suggest that the respondents chose item 2 and 5 as the prime viewpoint on their modification outcome. The value of mean is 4.15 and 4.20 respectively.

Table 13

5 (ii)		Frequency	Percent	Valid Percent
	Valid	43	93.5	93.5
	Need more bedrooms	1	2.2	2.2
	Need more space	1	2.2	2.2
	Need to change the roof material	1	2.2	2.2
	Total	46	100.0	100.0

Reasons for dissatisfaction

Table 13 shows the analysis of reasons for dissatisfaction with the outcome of home modification. There are 3 items that have been added by 3 respondents as a reason for dissatisfaction. The reasons include dissatisfaction towards the number of rooms, need for more space and need to change the roof material.

Perception of modification outcome are then analysed using multiple regression analysis which basically using the predictors in table 10 and 11 against the dependent variables in table 12 and 13. The outcome is shown in the 14.

PERCEPTION OF MODIFICATION OUTCOME

Multiple Regression Analysis for Perception of Modification Outcome

Table 14

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.173 ^a	.030	-.015	.67330
a. Predictors: (Constant), Material, Space b. Dependent Variable: Perception Of Modification Outcome				

Model Summary for Perception of Modification Outcome

Based on Multiple Regression Model Summary, the value of R square is 0.030. It means that 3.0% of independent variable explained the dependent variable. 97.0% is unexplained due to error.

Table 15

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.601	2	.301	.663	.520 ^a
	Residual	19.493	43	.453		
	Total	20.095	45			
a. Predictors: (Constant), Material, Space						
b. Dependent Variable: Perception Of Modification Outcome						

Analysis using ANOVA for perception of modification outcome

Analysis of Variance (ANOVA) is used to perceive the significance of Regression Model. Since the value of p-value in Table 15 is not significant (0.520), the regression model will be similar. In conclusion, independent variables (materials and space) has no significant influence towards the dependent variable (modification outcome)

FACTORS INFLUENCING MODIFICATION

Table 16

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762 ^a	.581	.504	.47068
a. Predictors: (Constant), Comfortability (Adaptability), Necessity, Comfortability (Width), Economically, Aesthetically, Comfortability (Quantity), Psychology				
b. Dependent Variable: Perception of Modification Outcome				

Model summary for factors influencing modification

Based on Table 16 of Multiple Regression Model Summary, the value of R square is 0.581. It means that 58.1% of independent variables explained the dependent variable. 41.9% is unexplained due to error.

Table 17

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.676	7	1.668	7.529	.000 ^a
	Residual	8.419	38	.222		
	Total	20.095	45			
a. Predictors:(Constant), Comfortability (Adaptability), Necessity, Comfortability (Width), Economically, Aesthetically, Comfortability (Quantity), Psychology						
b. Dependent Variable: Perception of Modification Outcome						

Analysis using ANOVA for factors influencing modification outcome

Analysis of Variance (ANOVA) is used to perceive the significance of Regression Model. Since the value of p-value is significant (0.000), so is the regression model. So, at least one of the independent variables has significant influence towards the dependent variable.

Table 18

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.458	.791		1.843	.073
	Economically	-.112	.114	-.116	-.980	.333
	Aesthetically	.605	.147	.614	4.124	.000
	Psychologically	.309	.154	.338	2.014	.051
	Necessity	-.116	.143	-.109	-.811	.422
	Comfortability (Quantity)	-.075	.097	-.117	-.771	.445
	Comfortability (Width)	.140	.094	.215	1.482	.147
	Comfortability (Adaptability)	-.018	.080	-.026	-.221	.826

a. Dependent Variable: Perception of Modification Outcome
Coefficients on the factors influencing modification outcome

Based on table of Coefficients above, the p-value for “Aesthetically” is significant(.000) which means that this variable is influencing the perception of modification outcome. While, the p-value for constant; Economically, Psychologically, Necessity, Comfortability as in (Quantity), Comfortability as in (Width) and Comfortability as an (Adaptability) is not significant which means that these variables are not influencing the perception of modification outcome. Regression model is used to measure the perception of modification outcome based on all independent variables.

RELATIONSHIP BETWEEN THE MODIFICATION OUTCOME AND THE FACTORS INFLUENCING MODIFICATION

Table 19

	Perception		
	Pearson Correlation	Sig	
Perception	1		
Economically	0.070	0.645	
Aesthetically	0.705	0.000	✓
Psychologically	0.607	0.000	✓
Necessity	0.328	0.026	✓
Comfortability (Quantity)	-0.333	0.024	✓
Comfortability (Width)	-0.223	0.136	
Comfortability (Adaptability)	0.178	0.237	

Summary Table for Correlations

P-value explains the relationship between Perception of Modification Outcome with all independent variable. According to table 19, p-value for Aesthetically, Psychologically, Necessity, and Comfortability (Quantity) is significant towards Perception of Modification Outcome which means

relationship exists between these variable. While the p-value for Economically, Comfortability (Width) and Comfortability (Adaptability) is not significant towards Perception of Modification Outcome. The correlation is significant at 0.05. The strength of the relationship is explained in table 20.

Table 20

Variables	Strength of Relationship
	Perception
Economically	Positive weak relationship
Aesthetically	Positive strong relationship
Psychologically	Positive strong relationship
Necessity	Positive weak relationship
Comfortability (Quantity)	Negative weak relationship
Comfortability (Width)	Negative weak relationship
Comfortability (Adaptability)	Positive weak relationship

Strength of relationship between reasons for modification and the perception outcome of terraced house modification

According to Table 20 above, the findings suggests that there is a positive strong relationship between the aesthetic reasons and psychological reasons with the perception of modification outcome. The finding also shows that in terms of Economy, Necessity and Comfortability (Adaptability), there is a positive relationship towards the perception of modification outcome. These variables can be used in further studies to achieve a better design and preference in housing construction and modification.

CONCLUSION

This paper presents modification trends in Taman Sri Cempaka housing area located in Melaka Tengah, Malaysia. The homeowners and residents of the housing area clearly modified their house to express their individuality and their taste in design as a resort to achieve comfort and satisfaction. This includes being able to cater space for family members. Some houses had made profound changes such as adding another storey to their houses to attain more space. Modification has helped the residents adapt to their lifestyle in terms of economy, comfortability, aesthetic, psychology and necessity. According to the findings in table 20, it is important that any modifications done to a house should include the reasons for modification in terms of aesthetic and psychology.

Extensions come in all shapes in sizes. They are varied or even idiosyncratic as the people who commission them (Mornement, 2007). The phenomenon can be seen as a positive action by the residents in improving comfort, a clear process of transforming houses into homes (Omar et al., 2012), the uniqueness of the terraced house monotonous design does not achieve its purpose after all the modifications that had been done. Keeping the original design however, seems least important than achieving personal needs. For this, the author would suggest a flexible house design that allows modification and personalization in certain parts of the house without disturbing the front façade thus, maintaining the uniform design – the initial design of the terraced house. Folding doors and sliding screens can be used throughout, creating the potential for the building to be a grand sequence of open-plan volumes or a network of private spaces, depending on need.

REFERENCES

- Abbott, L., Edge, M. & Conniff, A. (2003) Housing Modification and Implication for Future Housing Provision: A Socio- Psychological Investigation. ENHR/IAPS Conference. Stockholm, Sweden.
- Baldwin, E., and Tomita, S. (2007). Housing in Response to the Human Life Cycle. 2nd International Conference on Technology and Aging (ICTA), Toronto.
- Baum, S. and Hassan, R. (1999) Home owners, home renovation and residential mobility. *Journal of Sociology*, 35, 23.
- Becker, L. C. (1977). Property rights: philosophic foundations.
- Beggan, J. K. (1992). On the social nature of nonsocial perception - the mere ownership effect. *Journal of personality and social psychology*, Feb 1992, Vol.62, No.2, pp.229-237.
- Belk, R. W. (1988). Possessions and the Extended Self. *Journal of Consumer Research*, 15, pp 139-168.
- Bross, C.A. (1975). Normative housing deficits and residential adaptation. Unpublished master's thesis, Iowa State University, Ames.
- Csikszentmihályi, M. and Rochberg-Halton, E. (1981). The meaning of things: Domestic symbols and the self. Cambridge University Press.
- Dittmar, H. (1992a). The social psychology of material possessions: to have is to be. St. Martin's Press, New York.
- Furby, L. (1978). Possession in Humans: An Exploratory Study of its Meaning and Motivation. *Social Behaviour and Personality*, 6(1), pp 49-65.
- Giullani, M.V. and Bucchignani, V. (2000) Preservation Through Change: Renovating Modern Architecture. *Journal of Architectural and Planning Research*, 17, 36-46.
- Harris, C.M. (1976). The relationship between housing quality, housing satisfaction and residential adaptation: A normative housing study. Unpublished master's thesis, Iowa State University, Ames. In
- Parrot, K. R. and Lodl, K. A. (1991) Household Remodeling: A Step Forward Integrating Independent Research. *Housing and Society*, Vol. 18 (1), 78-86.
- Hashim, A. H., Rahim, Z. A., Rashid, S. N. S. A., and Yahaya, N. (2006). Visual privacy and family intimacy: a case study of Malay inhabitants living in two-storey low-cost terrace housing. *Environment and Planning B: Planning and Design*, 33, 301-318.
- Hashim, A. H., and Rahim, Z. A. (2008). The Influence of Privacy Regulation on Urban Malay Families Living in Terrace Housing. *International Journal of Architectural*
- Marcus, C. C. (1995). *House as a Mirror of Self: Exploring the Deeper Meaning of Home*. Berkeley, CA: Conari Press.
- Marcus, C. C., and Sarkissian, W. (1986). *Housing as if People Mattered: Site Design Guidelines for the Planning of Medium-Density Family Housing*. USA: University California Press.
- Mornement, A. (2007) *Extensions*. Adam Mornement. London, UK: Laurence King Publishing Ltd.
- Nasar, J. L. (1989). Symbolic Meanings of House Styles. *Environment and Behaviour*, 21(3), 235-257.
- Omar, E. O, Endut, E. & Saruwono, M. (2012) Personalization of Home. *Procedia - Social and Behavioral Sciences* 49 (2012) 328 – 340. 1st National Conference on Environment-Behaviour Studies. Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA
- Oulasvirta, A., and Blom, J. (2008). Motivations in personalisation behavior. *Interacting with Computers*, 20 (1), 1-16.
- Parrott, K.R. (1986). Critical factors affecting consumer satisfaction with the home remodelling process. (Doctoral dissertation, University of Nebraska, 1985). *Dissertations Abstracts International*, 47, p. 4207B. In Parrot, K. R. and Lodl, K. A. (1991) *Household Remodelling: A Step Forward Integrating Independent Research*. *Housing and Society*, Vol. 18 (1), 78-86.
- Parva, M. and K. Dola (2010). Differences between post-earthquake housing in rural and urban area. 1st International Conference on Rural Settlements: Housing and Fabric. Tehran. Iran

- Rahim, Z. A. and A. H. Hashim (2012). Adapting to Terrace Housing Living in Malaysia. *Procedia - Social and Behavioral Sciences* 36(0): 147-157.
- Rapoport, A. (1989). *Meanings of the Built Environment: A Nonverbal Communication Approach*. University of Arizona Press.
- Seek, N.H. (1983). Adjusting housing consumption: Improve or move. *Urban Studies*, 20, 455-469.
- Sherman, S. L., and Combs, E. R. (1997). Characteristics related to elderly persons' perceived difficulty of remaining in their current homes. *Family and Consumer Sciences Research Journal*, 26, 59-74.
- Tipple, A. G. (1996). Housing Extensions as Sustainable Development. *Habitat International*: 367-376.
- Varody, D. P., and Walker, C. C. (1999). Vouchering out distressed subsidized developments: Does moving lead to enhanced feelings of safety? *Environment and Behavior*; 31, 3-27.
- Zaiton A.R., and Ahmad Hariza, H. (2006). Privacy in the Traditional Malay House and Two-Storey Terrace Housing in Malaysia. 1st. International Symposium on Environment, Behaviour and Society. Sydney, Australia.

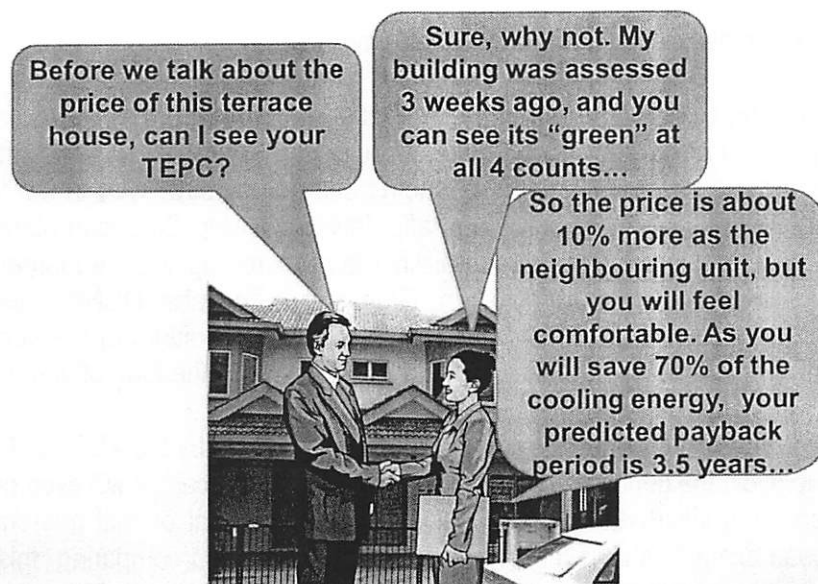
FOUNDATION OF GREEN & ENERGY EFFICIENT BUILDINGS: TROPICAL GREEN AND ENERGY EFFICIENT PERFORMANCE CERTIFICATE

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INTRODUCTION: BEYOND THE SICK BUILDING SYNDROME

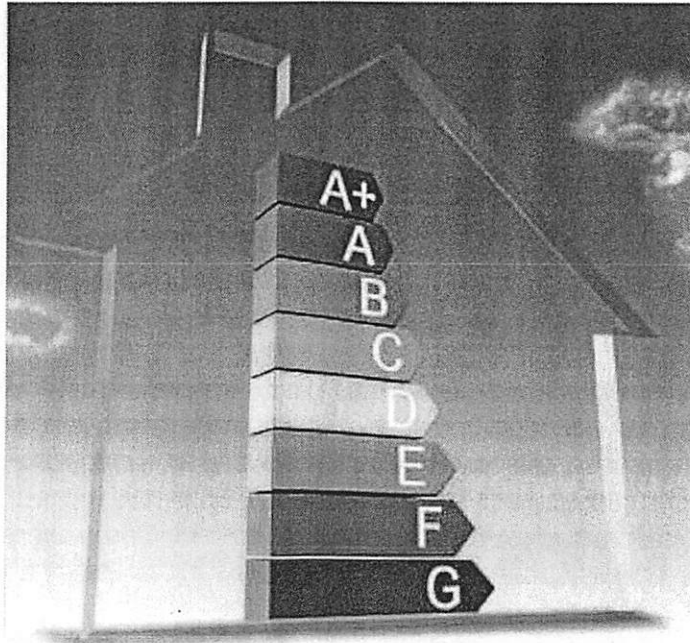
Over the past recent years, a high-tech developing country like Malaysia has become sensitive and proactive towards green solutions for the built environment. With the political framework created by the 10th Malaysia Plan, the Green Building Index and the self-commitment of saving 40% of CO₂ emission till 2020, Malaysia is on the spearhead of the development in the region to embark on viable environmental survival strategies. The country finds itself at a significant turning point to turn green ideas into practice. The so-called developed countries in the north, most of them with their energy potential being far more restricted, have already devised a wide variety of energy regulations and according renewable technologies that might be adaptable to green buildings. This contribution focuses on the adaptation of the EPC deriving from the European Union and the implications for a tropical country. Occupants are not longer simply victims of the offending "sick building syndrome". It comes up with a simple scientific colourful tool kit to measure the CO₂ -emission and sketches a case-study related staggered procedure how to save CO₂ according to the thermal comfort needs and affordability of its inhabitants. The proposed and tested toolkit starts with the question for a building how green it is.

Consider a property developer or a landlord ambitious to sell his or her green and energy efficient building. He has invested in green and enjoys both higher thermal comfort and reduced monthly electricity bills. He can claim he is a greener person, contributing with an effort to save the environment. Will the achievement be rewarded when he strives to sell the building for more as a landlord who did not? At first, let us have a look at the following conversation between a potential house buyer and the landlady about a tropically adopted energy performance certificate (TEPC) for residential housing:



Picture 1: Negotiating the Price of a Green & Energy Efficient Building

The often requested idea to implement an Energy Performance Certificate (EPC) for residential buildings is the current practice and furthermore regulation for ANY building in so far 5 countries of the European Union. The **Tropical-EPC** does not mean to copy the origin, but implies a cautious adoption to a warm country where cooling is by far the major environmental issue for the operational costs in the modern built environment. This tool provides no status of platinum, gold or silver, but distributes school marks from A+ to G aligned with the spectral colours:

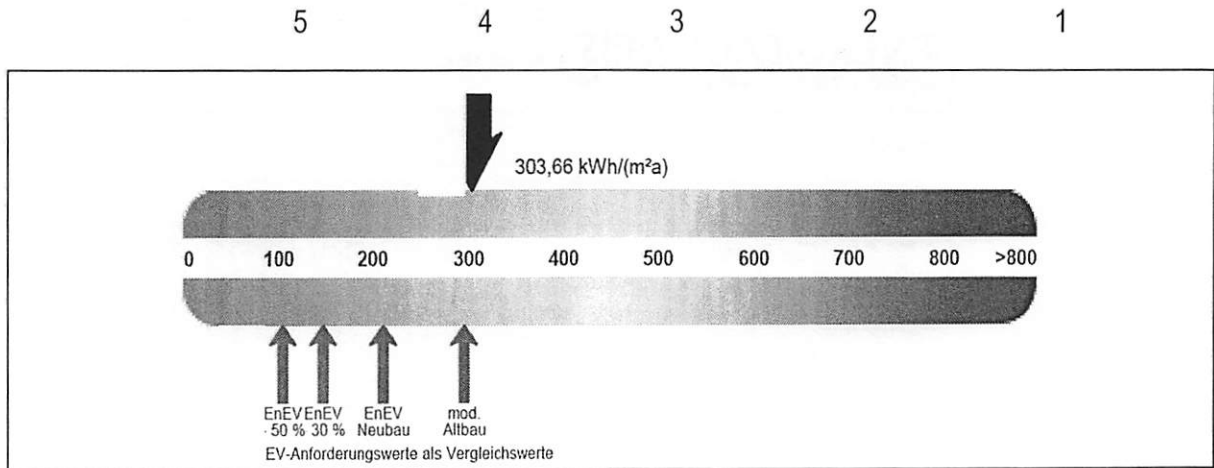


Picture 2: Energy Performance Certificate for Buildings

Following the school marks system, any building's energy performance can be certified between RED and even more than GREEN. A building, which is fully independent or is producing its own renewable energy and even can feed in electricity into the grid, will be granted more than mark "A" or green on one of its following four parts which is energy consumption. The Blue A+ building is self-sustainable like all natural life on our blue planet. In their extremes, A+-buildings are power producers that hence might supply the grid under the Feed-In Tariff (FIT, e.g. Malaysia 2012).

The practical meaning of the TEPC is not a green label solemnly shown to relatives, neighbours and friends how "green" and energy efficient the building is. It is there to assist the occupant or a prospective buyer to gauge how to save more energy and hereby save CO₂ in the future. In addition, selling will be facilitated, and the certificate is affordable (following European standards it would be about RM 400), The tool is a substitute and distinct from more sophisticated Green Building Indices (LEEDS – USA, BREAMS – United Kingdom, Greenstar - Australia, DGNB – Germany or GBI – Malaysia). The reason is that the EPC is SOLELY interested to evaluate a) the strength of insulation and subsequently b) the greenness of the electricity consumption in the form of energy efficiency.

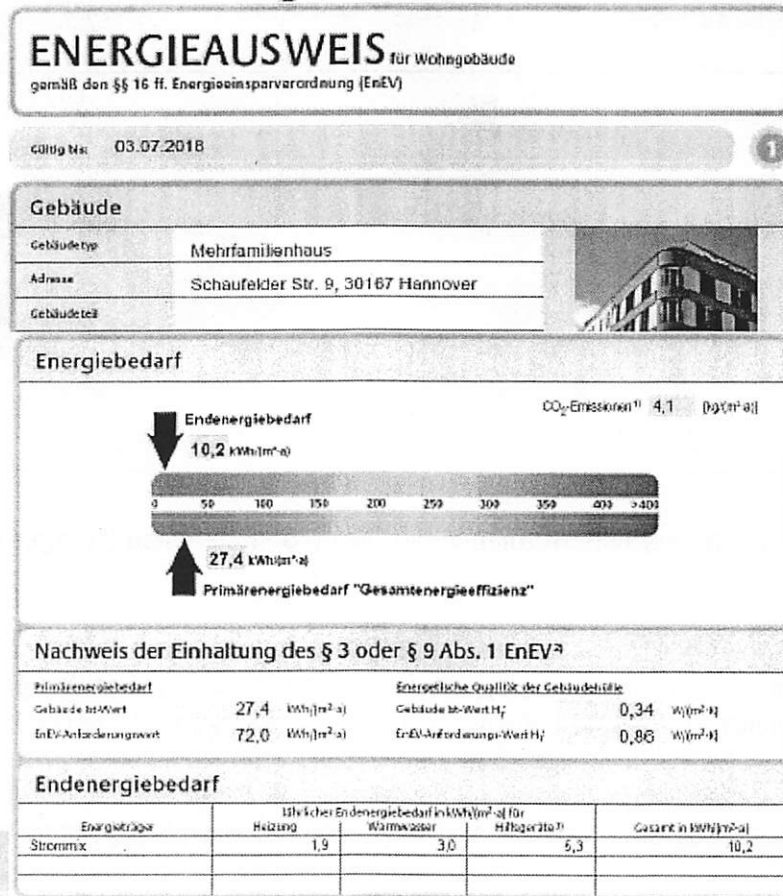
Along with three further criteria shown below, the certificate derived by the TEPC will show in how far a building is able to avoid the generation of energy AND, in the BLUE case it will even produce renewable energy for others. It is clearly benchmarked against so-called ideal or real reference buildings. The following European example shows the overall energy` consumption comparing "this building" against other reference buildings with different standards (retrofitted, newly erected, 30% and 50% on the scale of the most recent German Energy Regulation 2012 (EnEV).



Picture 3: Scale of Energy Performance Certificate Summary and Example of a Yellow Zone Building

As this “light-yellow” building is an existing building, it falls short of only kWh (m²a) electricity consumption if it were to comply with the official regulations for **4. retrofitted building**. That means, only minor renovations have to be undertaken in order to bring it from its 303.66 kWh (m²a) to the here permitted 295 kWh (m²a). Proven methods are by replacing single to double glazing with the effect that the primary energy demand per annum will decrease below the targeted value of 295 kWh (m²a) – if the green building consultant’s recommendation (e.g. consumption is monitored by a smart system) is implemented.

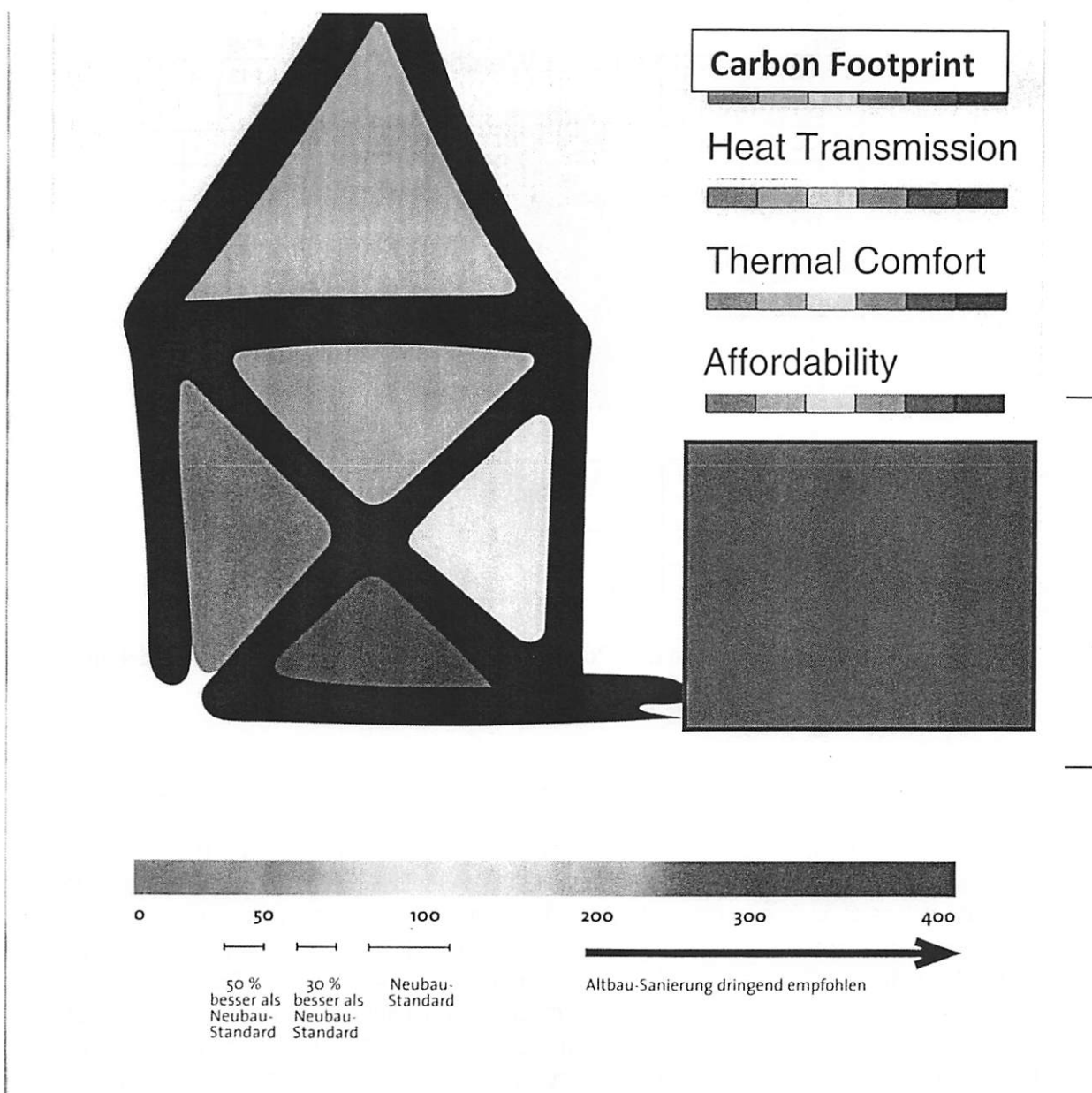
The following depiction shows the fully-fledged energy part of the performance certificate of a building in Hannover / Germany of a building which with 10.2 kWh (m²a) p.a. power consumption and 27.4 kWh (m²a) primary energy demand is already quite green. Selling this property to a new owner can anticipate the greenness of the building and help to negotiate accordingly towards a much higher market price compared to a common red building2:



Picture 3: Energy Performance Certificate Residential Building (Germany)


S MEASURING THE STATUS QUO IN A TRADITIONAL RED BUILDING:

Throughout the following pages, four core dimensions of the Tropically Adopted Energy Performance Certificate (TEPC) will be derived that come out of the Triple Bottom Green Line (chapter I): **CO₂ Emission, Thermal Comfort and Cost Saving** as **output**-factors derive from the so-called magic triangle of green & energy efficient buildings, whereas **Heat Transmission** (optimum insulation, up to air-tightness) is considered an enabler or **input** factor. Basically, prior to details elaborated further below, as a summary all of them can be individually measured between green and red:

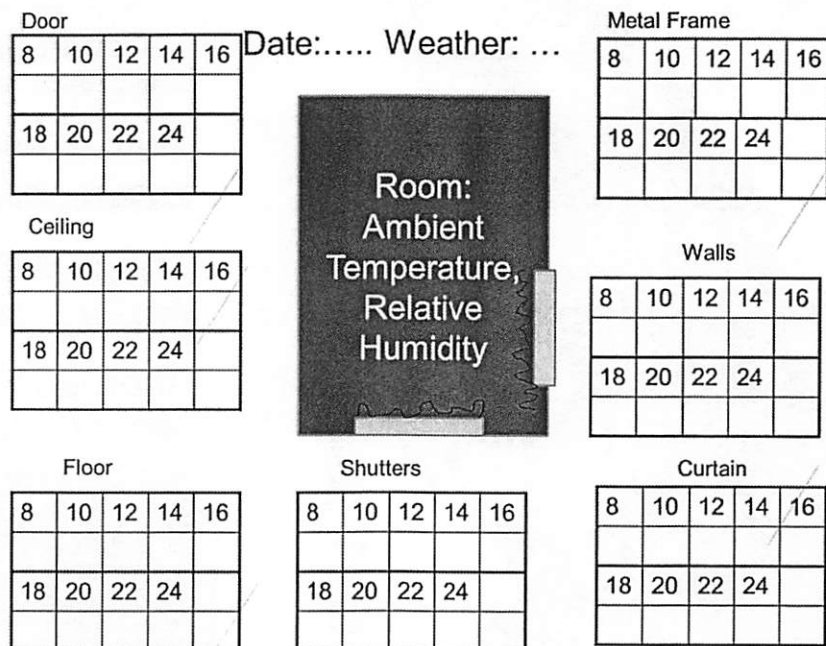


Picture 4: Four Parameters of the TROPICALLY ADOPTED ENERGY PERFORMANCE CERTIFICATE

In detail, this is the closer look into the four categories paving the way for further discussion:

a) Heat Transmission and Insulation Rate 

Within the current measurement, it is common practice to measure heat rejection indicators like R-values, better U-values, A-values, CHI-values and so forth. Within the TEPC, these values are enablers to reduce the basic temperature. As a concerted action, the approach mobilised here is quite different. Still we are utilising materials in terms of heat reduction, but in the end there is only one relevant factor to determine the greenness or redness of a building's insulation which is the radiant "surface" temperature of all the following 9 parameters at **peak** values during a set of 5 typical sunny cloudy afternoons:



Picture 5: Ambient Temperature of a Room's 7 Surrounding Elements measured 9 times daily (always compared with Outside Temperature!)

Again, the radiant temperature (respectively the humidity) is considered an input factor which is enabling a building to create an agreeable and healthy ambient temperature inside. It is possible to calculate the ambient temperature by using the single parameters above. The precise way is a mathematical formula that probably still is looking for its creative inventor. The easier way is to trust on statistical values of one's own research as we did in case of a room in an urban high rise contrasting a rural taman building with the following rule of thumb: The average of the radiant temperature of the room's 8 surroundings minus 1 = ambient room temperature at a given time. That means if we are able to bring down the radiant average peak day temperature on a sunny / cloudy day from 30 to 29 °C, the ambient temperature will result in 28 °C which is already in range of the tropical thermal comfort zone. If the average radiant temperature is still above 29.6 °C, it would be necessary to cool the respective room further or to decrease the ambient temperature until it is in range and can be maintained. Therefore, the colour scale along with a scale from 0-100 for an overall TEPC-scoreboard.

In contrast to the A+ value of the blue European energy performance certificate, blue in a tropical sense of surface temperature would mean an *over-delivery* of too cold temperatures which are not requested by any occupant. Therefore, the scores (max. 100, min. 0) are low, similar as when the temperature exceeds 29.6°C resulting in the maximum permitted room temperature of 29.6°C. Another dimension which is not discussed here is the acceptance of higher humidity of tropical occupants. As researches have proven several decades ago, the acceptable temperature is not necessarily only restricted to the fact being a Caucasian who accepts lower, and a tropical human being who favours higher temperatures. The longer a person lives in a tropical country, the more he or she seems to be adoptable with the local standard thermal comfort. The relative humidity is not considered being part of the TEPC, because its effects are highly controllable by our behaviour of taking showers, not eating too late and utilising ventilation.

b) Carbon Footprint



Within this tool, as the only emission CO₂ in relationship with the operation of gadgets is considered. Unlike the Green Building Indices referred to above, the TEPC will NOT include the carbon footprint through the generation and life cycle costs of the building. The reason is that the supply chain of an investment good like windows or walls is not operational, very sophisticated and the measurement might be also be subjectively biased and arbitrary. A building is a long-term investment with the possibility that even the initial carbon footprint will be depreciated through the course of time. In case of walls, doors and roofs, natural biodegradable and replantable local goods might be preferable compared with those which have to be produced with lots of energy respective carbon footprint. The usage of recyclable material (like in the case of light-weight concrete or wood wool) is a plus, in case we cannot fully rely on natural material like paddy husk or palm oil fibre alone. Furthermore, locally manufactured products and services for an energy efficient green building should be chosen over those from far or from foreign countries.

If we estimate the life expectancy of our building at 70 years, the carbon footprint of its generation will be factored in to every year of its operation. In addition, by using as many natural materials as possible, even the generation carbon footprint will decrease.

Two measurements can be distinguished: CO₂ / m³ / year or per occupant. In the following example, we chose "occupant":

CO ₂ /occupant /p.a.	COLOUR	Score for overall Scoreboard
< 100	DARK GREEN	100
100- 129	GREEN	90
130-149	LIGHT GREEN	80
150-169	YELLOW	60
170-190	ORANGE	40
190-209	RED	20
>210	BLACK	0

Picture 6: Exemplified Green-Red TEPC-Scale in terms of Carbon Footprint per occupant

The range laid out for the measurement above is based on our own survey asking students of the German-Malaysian Master of Green and Energy Efficient Building-programme to measure their daily and weekly energy consumption. A household with less than 100 kg/ occupant is considered low, whereas >210 is considered quite high. This tool is applicable for houses which are already being in use, not for upcoming houses. However, existing houses can serve as a great benchmark to avoid the generation of CO₂.

Description	Built in (Year)	Built-up m2/ Volume m3	Additional Appliances*	Costs/ KWh p.m.	CO2 per capita/ p.m.
1. Flat 5 storey	1988	98.25 m2	*	RM 35.00 160.55kwh	1 160/1= 160
2. 3 storey Terrace House	2008	67m2 Volume: 535.4 m3	*	RM 84 292 kWh	2+1 253/2.5= 121
3. 2 storey Terrace House	1997	98+88 Ground floor = 343 m3 First floor = 650 m3	Water Heater AC	154 RM 700 KWh	37 607/8= 202
4. Taman Semi-Detached	2009	83 m ²	*	RM 38 37.6 kWh	2+1 138/2.5= 101
5. Low-Cost Highrise (level 10, 25 storeys)	?	65 m2	Water Heater	RM 170 775 KWh	6+1 baby 672/6= 139

Table 1 : Case Studies Carbon Footprint per m³ and per Occupant

c) Thermal Comfort



We define Thermal Comfort as the *state of mind that expresses satisfaction with the temperature, humidity and velocity of the surrounding environment* (according to the SO 7730 or, likewise, ASHRAE Standard 55). Together with a) environmental sustainability and b) long-term cost saving, c) creating and maintaining thermal comfort for occupants of buildings or other enclosures is the third of the three important objectives of TRIPLE building architecture and engineering. Thermal comfort belongs to the family of basic individual needs. Presuming it is taken for granted or has significantly improved, it enables us in a concerted effort with other physical needs to climb up further the ladder of Maslow's renowned pyramid of needs. Conversely, in its absence, mainstream research holds that any thermal gain or loss above or beyond the following generic borderlines may generate a sensation of discomfort.

A typical Western conception of the state of mind called thermal comfort keeps on believing that the inside temperature for offices should be 21.1° C on average with variations of +/- 2.5° C (Thermal Comfort, Fundamentals volume of the ASHRAE Handbook (2005). Of course, in a cold country every °C that has not to be heated can save tremendously energy and budget. In recent years, this figure for thermal comfort has been even proposed to be altered for European offices to 24.5° C, which means an enormous deviation from the internationally renowned ASHRAE-standard (Braatz, 2008). For tropical countries, Busch (1990) carried out a pioneering field study for Thai offices in Bangkok and found that the neutral temperature or effective temperature for the air conditioned buildings and naturally ventilated buildings was 24.5°C and 28.5°C, respectively. A similar range of "neutral" conducive temperature was determined for a Malaysian School (Ibrahim Hussein, M Hazrin A Rahman (2009), based on PMV regression is 25.9°C with a comfort range between 24.4°C and 27.4°C. The trendy increase of temperature in offices and public cooled down areas also follows the in-part demise of the common dress code with suits and ties translatable into the 2011 policy by the Malaysian government requesting all state-owned buildings to set-point the temperature not lower than 24°C. Abdul Rahman (1995) in his ground-breaking study found that the most comfortable indoor temperature in Malaysia (tropical region) for residential areas ranges even from 25.5-28°C narrowing down the general recommendation by World Health Organization (1990) ranging from 18-28°C. Similarly, UTM's researchers Sabarinah Sh.Ahmad, Nor Zaini Ikrom Zakaria, Mohammad Shayouty Mustafa, Mohd Ghadaffi Shirat concluded that a 2.5°C range between 26.1°C and 28.6°C is optimum in tropical countries even for adopted people from Northern countries (2007). Others and our own findings clearly

confirm that the optimum residential area temperature for most tropical occupants in their privacy at its highest comfortable end should not exceed 28.6° C. As a conclusion, “the comfort band for the KL area for all building types is between 23.6° and 28.6° C with an optimum medium temperature in Malaysian households of 26.1° C” with the upper space limit (USL) set at 28.6°C”. Two reasons can be sorted out. 1) the lower cost when putting the highest set-point in a tropical warm country. 2) the perception by people living in tropical regions is different from those in temperate and cold regions (Wang and Wong, 2007; Singh et al., 2009). The perception is based on lifestyle and habits, and based on economic necessities. All of them contribute to the explanation of the following comparative depiction:

Northern countries	19.1	21.1	23.1	ASHRAE, 2005 (general)
“new approach”	22.5	24.5	26.5	Braatz, 2008 (offices)
Malaysia (KL)	23.6	26.1	28.6	e.g. UTM, 2007

Table 2: Comparison of different thermal comfort definitions

Devising the tropically adopted concept of energy performance for thermal comfort with these higher temperature banding can cause a steep increment in terms of energy saving potentials by 4-7% of less CO₂ and energy cost with each degree centigrade the temperature is increased (Green Efforts Start at 24°C. In: The Star, 12/08/2011, 2). Unfortunately, even if the USL (upper space limit)-temperature is set to its highest end at 28.6°C, in a typical uninsulated concrete building -with the walls, windows, ceiling and roof as permanent heat traps- TTC cannot be achieved during a sunny / cloudy day even in kampong areas (Sanusi, 2010).

We stripped off relative humidity, for simplicity reasons, and for the reason that apart from the A/C it is volatile and hard to control within green cooling. Green makes the humidity more humid, but if we would be able to adjust the rules elaborated in the chapter on green lifestyle, we would not consider the high humidity as a serious issue.

The determination for the greenest of the temperatures above is the one which is able to create thermal comfort along with minimum CO₂ emission at reasonable costs (below). Apart from the environmental issue, it can be concluded that whether blue, dark green or light green is the target of our building is a matter of individual well being. Therefore, European and Tropical Green may have a different weightage. If the temperature is between 26.8 and 28.6, the highest scores can be achieved. The weightage of European green is lower, but might receive higher scores in the Northern atmosphere. Average scores during 3 times daily with sunny/cloudy conditions, 2 days no rain.

d) **Cost Consideration** 

The last variable is dedicated to answer the question of the last angle of the magic triangle whether or not and for whom a GEEB is affordable. This is a vital subjective question, because it is widely believed that green buildings are necessarily quite expensive and therefore a NO-GO. Therefore, those who know and would appreciate to become owners, believe they are not able to purchase a new unit or to retrofit an existing one complying with our desired thermal comfort levels above at all time.

a) However, for **new buildings** we can state that following the European principle a passive house (as the most radical version of the green and energy efficient building!) **may not exceed 110% of the investment costs of a traditional RED building** with cost saving from the first moment the

building is in operation with pay-back periods of less than 1 – 5 years. In terms of the following scale for a residential building, this is still considered LIGHT GREEN:

RM	COLOUR	Score for Overall Scoreboard
Cheaper than standard house	DARK GREEN	100
100 < 110%	LIGHT GREEN	90
111 < 120%	YELLOW	70
121 < 130%	Light ORANGE	50
131 < 140%	Dark ORANGE	30
140 < 150%	RED	15
> 150%	DARK RED	0

Picture 7: Exemplified Red-Green TEPC-Scale in terms of Affordability (New Buildings)

b) The case of an **existing standard** residential building to be retrofitted clearly again is even more a *subjective* question and answer. Whether it can be greened like in case of the reference buildings an additional investment of less than RM 5,000 with the possibility to break even after maximum 5 years might still be green or red, might mainly depend on three parameters: a) the family's income, b) the cash flow and, first and foremost, c) the readiness to invest into green. Furthermore, one caveat and prerequisite is that the building does a "smart" job, and has to be smarted with additional cost incurred! That means green cooling PLUS building automation can adjust the temperature according to the occupant's wishes at heat peak hours, and react flexibly to the building frame's ability to serve for already much colder temperatures compared to a standard building (elaborated above under pillar 2 - electricity).

The following scorecard is more subjective. It presumes that this mid-class household has an annual cash flow of RM 20,000. Therefore, it could easily digest green retrofitting expenditures of RM 10,000 and would still have another 10,000 RM for other cost positions. That would mean that RM 5,000 could easily be absorbed, and up to RM 10,000 are still at "green-light" status with a high consideration for investment.

On its RED end, this exemplified scale is left open on purpose, starting with an amount of RM 30,000 which might be quite hard to invest for our mid-class income example above. Of course, the RM 5,000 rule needs to be adopted not only towards the financial capacities of the occupants which are usually the owners (cash flow), but also towards the size of the building

Both scales (new and retrofitting) can now be compared with the payback periods of its investments due to lower operational costs in terms of energy consumption.

In order to illuminate the applicability of the TEPC, prior to generic research ideal type examples for retrofitting have been selected. Out of these, only one case study has been chosen to illuminate the operability of the TEPC for a Malaysian house.

Case Study: Typical 1990s-Retrofitted Kampung House

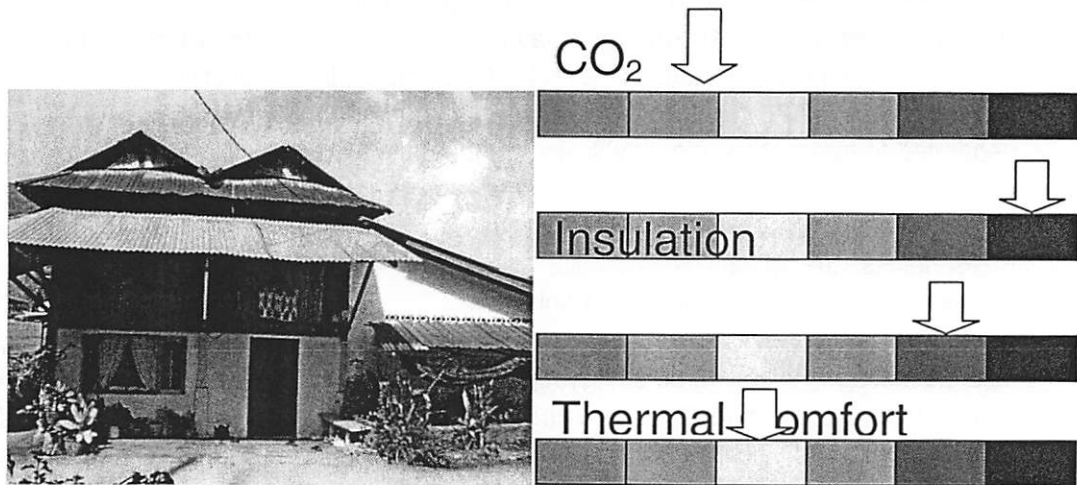
Size: Estimated $160m^2 = 480 m^3$ cooling load with first floor utilised as bed rooms

Number of rooms: 5 plus one living lounge and kitchen area

Location: Rural area (not affected by city heat stack effect) with evening temperatures at peak heat days reaching thermal comfort between 9 and 10 p.m.

Occupants: 7 adults, 4 children (age 3-14)

Occupation family head: Carpenter (therefore no labour costs involved for basic retrofitting)



Picture 9: Case Study (Typical 1990s-Retrofitted Kampung House and Applied TEPC)

1: CO₂ = GREEN (only 4 fans, common fluorescent lighting tubes)

2: Building envelopes radiant temperature (measured at peak hour): 34.1 C = DARK RED

3: Thermal comfort (same peak hour): 32.8 C = RED

4: Affordability = YELLOW: In order to bring 1, 2 and 3 into green, the expenses are the following priorities. Monthly cash flow = RM 500 => annual cash flow = RM 6,000.

(1) Insulation:

Investment Costs of this Thermally Comfortable
Kampung House

= RM 6,940
=====

(2) Green Cooling (Night-Time Ventilation):

Total Electricity Costs of this Thermally Comfortable Kampung House

= RM 3,000
=====

GRAND TOTAL

RM 9,940

=====

As the owners profession is carpenter, and he is not fully booked with other commitments, RM 9,940 is the final estimated expenditure to slowly go into green.

CONCLUSION AND OUTLOOK

In order to assist the government of Malaysia to bring down the CO₂ emission, the TEPC can play its part as it did in Europe. It can contribute for mass appreciation as it contains a clear affordable business model for landlords and even tenants. Negotiations with internationally operating bodies like TUEV will

show in the near future whether the approach is viable for developing countries in the tropical and subtropical belt. However, these are potential impasses we have to face.

- **Lack of Reliable Research Data** so far, we only can rely on selected case studies rather than on a multiple of generic cases to green tropical green buildings.
- **Availability of System Knowledge (playing together as a "Green Orchestra")**: the TEPC has to jive with the idea looking at the building from a holistic perspective.
- **Transparency of Professional Benefits (ROI) out of research.** Reliable data are not yet generated to forecast the monthly saving on the part of the electricity bill due to implemented efforts to green a building further.
- **Availability of Resources**: a visit to green expos shows that knowledge is available. Nevertheless, the market is not quite transparent when it comes down to source green suppliers that can cater for necessary solutions.
- **No financial Incentives (market value like European energy regulations).** Policy should take the first turn via staggered energy regulations to enforce green strategies via the TEPC.
- **Mindset of Owners and Tenants (Short-Term Thinking and other priorities - Demand Preference Structure DPS).** Of course, the greatest challenge of all is to create a change of mindset within the population which can only be achieved with a generic roll-out plan compiled by a committed team and spearheaded by a highly effective business organisation.

REFERENCES

- Abdul Malek Abdul Rahman, Muna Halim Abdul Samad, Azizi Bahaudin, Mohd Rodzi Ismail (2009), *Towards a Low-Energy Building Design for Tropical Malaysia*. Penang: USM Press
- ASHRAE (2008), *Thermal Comfort*. Fundamentals volume of the ASHRAE Handbook, Atlanta, GA.
- Byrd, Hugh, *Energy and Ecology. A View of Malaysia Beyond 2020*. USM Publication. Penang 2008.
- DENA (2009), *Renewable Energies made in Germany*. Berlin.
- Ellis, F.P., *Thermal Comfort in Warm, Humid Atmosphere: Observations in a Warships in the Tropics'*, The Journal of Hygiene, 1952.
- German Federal Ministry of the Economy, *Energieeinsparung (Energy Saving)*. In: <http://www.bmwi.de/BMWi/Navigation/Energie/Energieeffizienz-und-Energieeinsparung/energieeinsparung.html>.
- Ibrahim Hussein, M Hazrin A Rahman (2009), Field Study on Thermal Comfort in Malaysia. In: European Journal of Scientific Research ISSN 1450-216X Vol.37 No.1 (2009), pp.134-152.
- Sabarinah Sh.Ahmad, Nor Zaini Ikrom Zakaria, Mohammad Shayouty Mustafa, Mohd Ghadaffi Shirat (2007). *Achieving Thermal Comfort in Malaysian Building: Bioclimatic Housing*. Universiti Teknologi MARA Skudai, Malaysia.
- Tuschinski, Melita, *EEWärmeG + EnEV Kurz-Info und Praxis-Dialog: Erneuerbare-Energien-Wärmegesetz und Energieeinspar-Verordnung anwenden. EEWärmeG + EnEV. Briefing and Practical Dialogue:Renewable-Energy-Law and Application of Energy Saving Regulation*. Berlin 2010.
- Volland, Karlheinz, Volland, Johannes, Dirschedl, Dieter and Fichter, Martin, *Warmth Protection and Energy Demand according to EnEV 2009: Step-for-Step to Energy Performance Check for Residential Areas* .Müller. Verlagsgesellschaft. Nürnberg 2009.

- Wagner, Karl (2013), *Tropical Thermal Comfort and Adapted Tropical Green Residential Housing*. In: Conference for Affordable Quality Housing. Putra Jaya 13/03/2013 (V).
- Wang, L. and Wong, N.H. (2007). *Applying Natural Ventilation for Thermal Comfort in Residential Buildings in Singapore*. *Architect. Sci. Rev.*,50: 224-233.
- Weglage, Andreas, Gramlich, Thomas, v. Pauls Bernd,v. Pauls Stefan *Energieausweis - Das große Kompendium: Grundlagen - Erstellung - Haftung (Energy Performance Certificate - Basics - Procedure – Legal Issues*. Vieweg+Teubner, Stuttgart. 2009
- Zalina Shari, *Building Performance Assessment Systems: The Emergence and the Variety*. In: UPM Housing Research Centre, Housing News Issue 12, Jan – Jun 2012:7.

IMPACT FLEXIBILITY PRINCIPLE ON THE EFFICIENCY OF INTERIOR DESIGN

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ABSTRACT

The building which uses flexibility property in its design of plans and furniture are considered from high efficiency design and provide economic future costs , The flexibility is one from geometrical properties which used in many fields of engineering and architectural design to solve the area problems and multi-use plan. It could provide many possibilities to change the shape and size of internal space in addition to the economic and social impacts on the population in the housing system .The increasing of moving from the rural and suburban to the main city offset router by new and creative designs and experiences that seek to solve the problems associated with immigration ,As these non-deliberate immigration led to make the city as a template of ice in the vicinity of hot water and cause the melting of this city and ending the efficiency of the economically live, housing and social, Because of this necessary needs, the designer started new and creative ideas to design skyscrapers and multi-storey buildings to cover the housing and economic needs. These solutions vary mechanism from one area to another mismatch of vertical buildings and uses them depends on the reduced space. This research will be to study the possibilities of flexible designs and its impact on the efficiency of Interior Design in addition to the using of integrated serves to get a creative and sustainable design to make our city more livable. The principles interior design of the housing unit has a significant effect in increasing or decreasing economic and housing building, in this paper the principle of flexibility design will be studied in two line

line 1: flexibility plan (space , wall , floor , ceiling)

line 2: flexibility details (furniture)

In this study, 4 virtual models for housing unit will be built with specific functional requirements (bedrooms, living room, kitchen, services ...), the first design (A) does not use the principles of flexibility in the design of either the second model (B) uses the principle of flexibility in Design In three cases:

(B-1 only flexibility in plans) (B-2 flexibility in the details only) (B-3 flexibility in plans and details)

After completing the study process was measured efficiency designs and functional requirements and residential. In addition to measuring the economic efficiency solutions, has been found that the use of flexibility in planning and details (B-3) leads to savings in space and costs dramatically with the efficiency to meet the functional need. The model (B-2) (B-1) they were incompetent but also by 53% for model III (B-3), also said the results showed that the model (A) was the least efficient and 32% for other models. This design make city more livable and sustainable, we can conclude that the small detail in design like furniture and the integrating of design are the important element to developing the live in our cities

Key Words: *Flexibility, interior design, spaces efficiency , sustainability , integrating building .*

INTRODUCTION

Livability depends on how sufficient services, energy and enough area for every person in addition to economics that considered the most important factor that helps immigration from city to suburbs and makes unbalanced budgets, but at the same time people stay connected with cities by workplace , as example ; in Iraq we considered low cost housing is the best solution for this problem as we can build low initial cost housing with less areas 100-250 square meter, but the problem of selecting building sites stills as the most of housing facilities locates at suburbs which helps leaving mother city and as result that will increases transportation costs, so people invented another odd solutions by dividing the plot area for building as some reaches lower than 50 square meter for each housing unit with very low living spaces efficiency , This paper will study how to find optimum methods for reaching an economic, functional, psychic and aesthetic efficiency in a small area spaces by using flexibility principles which makes the city a livable place, flexibility also helps finding a new architectural solutions to get the maximum benefits and functional use of small areas .

Flexibility is one of physical properties of materials and geometrical forms used in interior design, that property depends on physical shape in addition to its compositional and other structural properties, so that repetition, balance, similarity can be used for making flexible space, which means that we can use that geometrical properties in order to gain a flexible space that can be transformable and multi-uses in the same plot area.

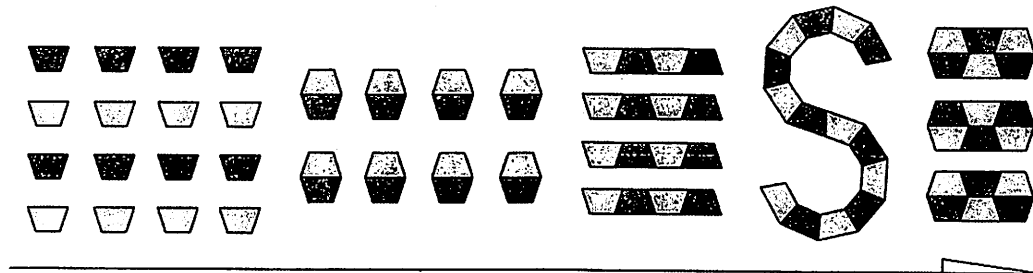
The social and environmental pollution is the main reason why people immigrates from rural areas to main cities in addition to living cost at city as compared with suburbs. and that what makes the study of possibilities of making city a place that able to live properly by using all designable means that connected directly with people and society life is very necessary .

And this is the reason why we must study environment surrounds people starting with living space and then the whole city space, some architectural engineers several means to reach flexibility in the designed space, which used in the whole composite, detail levels and relationship between them depending on flexible structure that shapes space and the possibilities of changing it as needing to, with the furniture flexibilities and possibilities of its arrangement and transforming an additional to use some forms that allows free formations .

There is several principles of geometrical designs that are using flexibility and the flexibility assisting properties as basics for thoughts and it is under three main points:

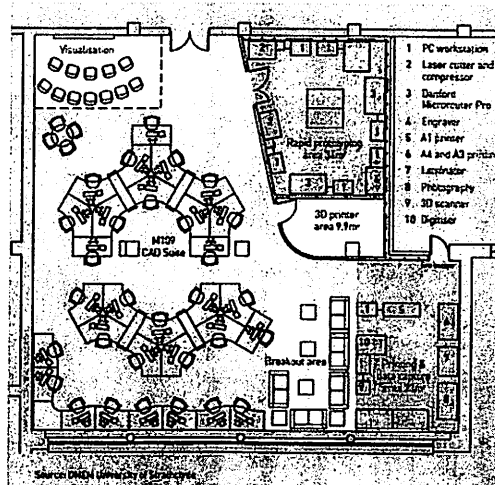
1. Flexibility in vertical partitions: some designers used vertical partitions that are movable and reshaping space for aesthetic, functional and economical uses in the same time in order to make best and maximum use of plot area that responds increasing people needs.
2. Flexibility in horizontal planes and levels: flexibility in horizontal planes and levels is used for getting appropriate interior spaces that responds people demands, so that it makes possible to control space levels and the economical efficiency that reached from responding multiple needs in the same space as it reduces demanded plot area. As we can use vertical partitions and horizontal planes and levels flexibilities together, as we can change vertical partition to horizontal one and verse versa, to reaches maximum flexibility at minimum space and materials.

3. Flexibility in furniture : this term is used for describing nowadays furniture as physical property of furniture itself, so as chair can be converted to bed or table ...etc., despite of that, there is another design ideas that depends on relationship between furniture and space so that (as example) the bed can be hide into wall or ground, or rose it to the ceiling to be part of design, as well as , the furniture can have some shape properties that add another type of flexibility which gained from repeating the furniture piece with changing arrangement or adding another pieces without decreasing the aesthetic and functional efficiency of space (Figure 1) .



1) flexible used of tables in classroom .(refer.: researchers)

(Figure



(Figure 2) flexible used of tables in learning space. (JISC eSpaces Study, 2006)

LITERATURE REVIEW

There are a lot of geometrical and artistic studies that focused on several geometrical shape properties in interior design, with tat properties we can produce many interior spaces that have an aesthetic, functional and economical functions at the same time.

Some of these studies suggested that interior design depends on client rules and demands (functional, psychic and aesthetic), at the first place we can reach the appropriate space for people with structure as it is an interactive process between designer and user (Silverstein & Lorinda, 1993), using shape construction principles is necessary in interior design because space perception and sense

depends on it, as some studies mentioned that balance and scale as basic principles in interior and furniture design that is the shape balance lead to better space perception in addition to better abilities to reach functional demand (Qasim, 2005). Some other studies focused on space form and how its composite and its generation fundamentals which should be depended on aesthetic sense and imagination, and information process from user to designer must be clear so that design reaches the client demand of design (Silverstein & Lorinda, 1993).

Good design cannot be produced if it didn't reaches client psychic, expressive and aesthetic demands in addition to function which is designed for in order to get comfort, moving flow, good seeing and needs of thermal comfort (Qasim, 2005).

Interior design process is an innovation process of an object or idea and putting it functionally in our life, Interior design locates in bigger field which is the environmental design, and this environmental system has two basic parts as refers by Environment design Research Association (EDRA):

- Physical environment: which can be measured and described by visual, thermal and dimensional, etc.
- Spatial environment: which can be aware and measured by size, number, type and shape in addition to aesthetic and formal relationships which connect it.

Studying form and its relationship with space is so important because the elements are organized in groups and do not act as parts in space, but they define space that could be percept through several relationship as (Qasim, 2005):

- Shape and background: contrast between shape and background leads to strength form and can be considered unique form in space, contrast case gives shape legibility, importance and identity within space.
- Continuity: continuous relations between elements through keeping same shape, color, texture and pattern.
- Sequences: continuity of organized elements perception within space and ensure that any change will not cause any cut but increase effects and intense space.
- Repetition : a kind of sequence that can achieved by repeating an element and gives more flexibility to space, repetition does not condition to be in shape and structure of interior space but can be in furniture and additional elements in space.
- Rhythm: sequence of repeated elements in certain periods within one composition.
- Dominance: giving more importance to one element within space, that can be possible by increasing size or selecting focus point, etc.

- Similarity: repetition of one element around point or axis, similarity provides order and legibility for element that it contains and ease its perception.
- Proportion is one of the most properties that used in interior and exterior design and it is the basic reason that effects of form shapeliness perception, the relation between human and space proportion makes the space more efficient (M. & M, 2008). Using Modular in design helps space to be more flexible and that causes easier and faster modeling and arrangement possibility of space.

There is many definitions for proportion; some of them defined ratio as numeric quantities shapes mathematical relation between two objects or more among whole group parts, and the fracture formula used for expressing ratio like the ratio of length to width of rectangle, proportion in architecture is the consistency of architectural form dimensions and architectural elements among each other and between them and the whole architectural composition , proportion linked by functional , aesthetic and structural sides of architectural form as it helps of presenting the building certain architectural character and its compositional structure. And it is a process aims adjustment and balancing architectural composition by certain principle. At the beginning of architectural interactive architect usually can not adjust proportion directly as he proceed the general logical composition counting on his experience and aesthetic sense then comes the adjustment of proportion and balancing the composition an advanced stages (Ching & Binggeli, 2012) .

Some studies suggests that the main reason of reversed immigration from rural areas to cities is the environmental and social pollution in additional to economical cost in city as compared with suburbs which makes the study the possibilities of making city a livable place is basic priority (Philips, 2010) .

The study of (Newman, 1999) (role in delivering city live ability) refers that one of the sustainability fundamentals is flexibility and variety, and the main standards of sustainability is :

- Capacity.
- Fitness.
- Resilience.
- Diversity.
- Balance. (Newman, 1999) .

There are variables related with sustainability including flexible shape of the building and has the following characteristics:

- Scalability, modification and adaptation of functional variables
- The possibility of multiple use and saving on space and energy
- compacted the building for more than one function with less size
- Consolidation method that allows for flexibility in services and a reduction in operating costs.

There are many examples of using the principle of flexibility to achieve sustainability, As in the windows for BMS building which can opened a two-way and high levels of adoption of natural

ventilation. The roof has also been used in interior design waveform to be interaction with cooling services in order to integrate the methods of ventilation and avoid problems as well as the impact of audio waveform in increasing the capacity of space in addition to aesthetically sense. Aggregates of cooling and heating pipes was also used in the division office spaces in this building, In addition to the use of hollow glass tubes containing a water chute is working to isolate and divide spaces and in this case it used as functional object and interior element in addition to achieve sustainability because the recycled water is the same water-cooling and heating.

In another study Ecological buildings It means the internal environment of health as it is used less energy as possible for the air conditioning systems and cooling to achieve energy efficiency and systems operation and maintenance, services and events, either the types of the construction materials indicate the study to the importance that the materials are good quality to reduce the destruction of the internal environment, some studies have indicated that good design is tested by use of space efficiency standards, regulations and construction technology as well as the symbolic and its relationship with the beauty of the design, either environmental form is a relationship between the formal design process Active in climatic terms. (Hui, 2002), the environmental form is a relationship between the formal design process Active in climatic terms. (Hui, 2002).

Relationship must be flexible as to achieve sustainability linked to green building standards, which depend on reducing energy and environmental pollutants used in addition to the conservation of non-renewable energy, which could be achieved through flexible space as in which you can achieve energy savings and space. (Edwards, 2001)

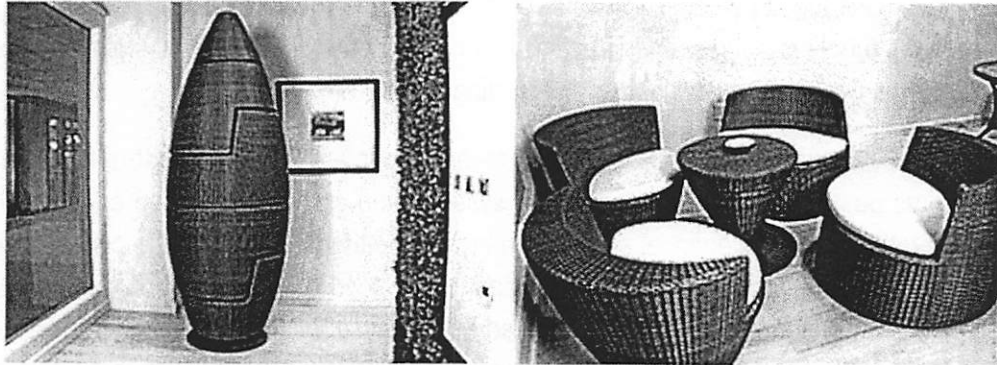
The study discussed the Theo Van Doesburg a founder of "De Stijl" ideology who expresses his theories in a paper titled "toward a flexible architecture" as follow; "Modern architecture is an open one. A unique space constitutes the whole house that is partitioned according to required application and performance. Such partitioning takes place through internal divider walls and external supporting ones. The former divide the house space in accordance with performance and application which could be portable (in contrast to traditional dividing walls), that is such walls could be designed in a way that frames and handy plates could be replaced." (Emamgholi, 2011)

Some of studies pointed to the residential complex which designed by Mies van der Rohe which is the interior walls can moving to change the interior space as the owner wants. Rooms without door between it to keep the area for each person . (Poldma, 2013)

The study mentioned that real tried was made to create the perfect flexible space but there are many problem in the cost and functional properties because each designer create his flexible space without a serious study for cost and Efficiency of space. In the first time flexible building design without a real method but in this time there are so many method to create flexible space and depended on the new material and technology method . (Poldma, 2013)

There two kind of using flexibility to create a multi-used space , the first one which is used with furniture (figure 3) , the second which is used with building construction like wall and floor , each has many branch as the researchers mentions. Maximum & optimum utilization of the interior space require flexible design of furniture in the space as combined. Many furniture is designed using folding patterns

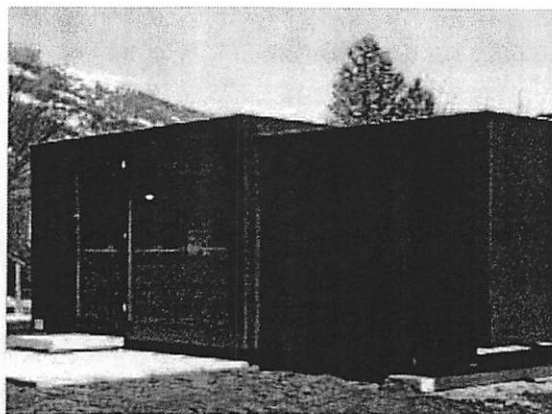
or drawer included with mechanical or electrical features and this furniture can make from the interior space maximum efficiency takes place through ergonomic and human fitness. (Emamgholi, 2011)



(Figure 3) The Obelisk Chairs designed by Janus et Cie (FELDMAN, 2013)

The other study pointed on the properties of flexibility which were used in most flexible building and its idea, there are many properties for flexibility but the most five used are:

- Assembling and Disassembling
- Folding and Unfolding
- Adapting
- Combining
- Transporting
- Wearing and Carrying.



(Figure 4) "Homeless person's dwelling", Tokyo, Kaufmann Architecture (Jones, 2001)

CONCLUSIONS FROM PREVIOUS STUDIES AND IDENTIFY ELEMENTS RESEARCH

After reviewing the previous studies, some of which are concentrated form and flexibility, and some flexibility in general, and others of the importance of sustainability and the ability to adapt and livable .

Studies show that there is a strong relationship between flexibility and structural characteristics of the form as well as the relationship between sustainability and form and function. As studies indicated the possibility of achieving flexibility through using of formal characteristics as following :

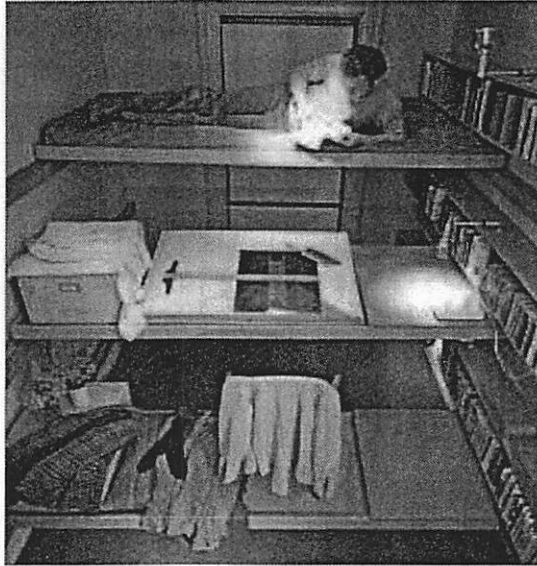
- 1- Repetition : there are three levels (Partial, whole , Both) and in contain three main variable as following :
 - Type of repetition: as the previous studies there are two type the first one is Linear repetition (horizontal X,Y and Vertical Z) and the second one is Central repetition (round point , radiant)
 - Repetition's Method: its meaning that is transformation in shape, size or direction.
 - Ratio of obviousness: sometimes using repetitions in interior design lead to monotony, so the architect make the repetition unclear to cover the monotony which is caused of lost the repetition properties.
- 2- Proportion and scale: its considered from the important geometric characters which related with flexibility, As the adoption of non-standard ratios in the design of interior space leads to a wrong perception of space in addition to the difficulty of perform the function. It can make the space more flexibility through the adoption of measures to achieve a good fit for space and greater flexibility. Can be divided into three variables
 - Numerical
 - Fractional
 - With scale
- 3- Axiality : The Axiality property has a real impact on applying flexibility, as it depends on the type of the increase in axial space or repetition in design elements without affecting the perception of form efficient functions , but could has a positive impact, and axial types are:Linear , Radical , Point , interaction (Ching & Binggeli, 2012).(Figure 3).



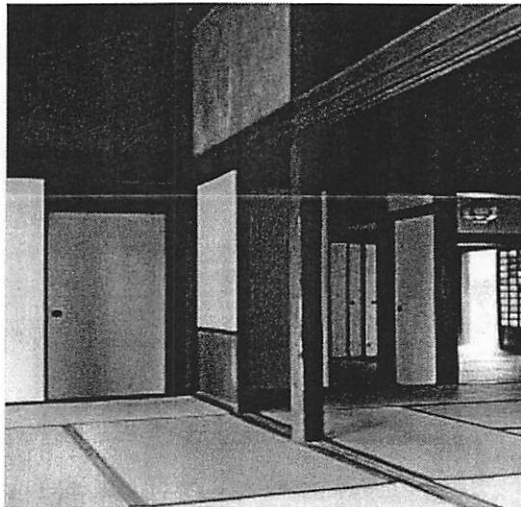
(Figure 5) types of Axiality (drawing by researchers)

- 4- Flexibility: The studies, which focused on the concept of flexibility can be the conclusion of some vocabulary which is on three levels (Partial , Whole , Both), which are two main types.

Furniture and flexibility are divided into (flexible furniture, flexible furniture with anthers , flexible furniture with the structure of space) and its impact on the aesthetics of the interior space. flexible structure is divided into (horizontal flexible, vertical flexibility, flexibility in both directions) and its impact on the aesthetics of the interior space.



(Figure 6) Michael Hollander, room with movable levels, New York, c. 1970 (Jones, 2001)



(Figure 7) Residential building near Osaka, 16th-17th century. Shigeru Ban, "Curtain Wall House", Tokyo. (Jones, 2001)

- 5- The studies on the efficiency of space and the and sustainability can using the following vocabulary:
- Area savings.
 - Size savings .
 - Ability to adapting in using space.
 - Materials savings.
 - Energy savings.
 - Division and increasing portability.

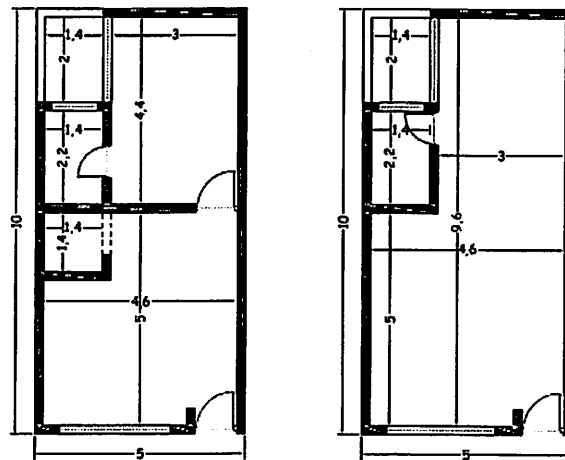
After selecting variable form is designed to measure the variables, as follows:

(Table 1) Measurement form variables. (refer. : Researcher)

Sample No.		Figure				
Main Variable		Secondary variables	Partial level	Whole level	Both	
X1	Repetition	Repetitions type	linear	Horizontal		
				vertical		
			central	Around point		
				Radiant		
		Repetitions method	With transformation	In shape		
				In size		
				In direction		
		Ratio of obviousness	Without transformation			
			clear			
			Medium clear			
unclear						
X2	Proportion & scale	Numerical				
		Fractional				
		With scale				
X3	Axiality	Linear				
		Radial				
		point				
		Interaction				
X4	Flexibility	Flexibility types	Furniture	Furniture self		
				Furniture with anthers		
				Furniture with space		
		Structure	horizontal			
			vertical			
			both			
		method	Transformations			
Flexibility in material						
X5	Space efficiency	area savings				
		size savings				
		ability to adapting in using space				
		materials savings				
		energy savings				
		division and increasing portability				

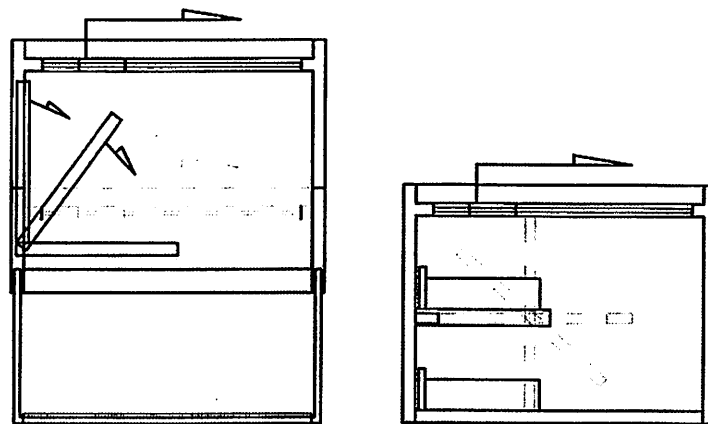
PRACTICAL STUDY

After selecting the variable related with the flexibility and livability in cities , one models of housing in the city of Mosul - northern Iraq was selected , As the value of land is too high, residents in the city were able to find individual solutions in the residential land use, They divide the land into more than one section, in some areas to 50 square meters for residential unit, But with low efficiency in terms of spaces and functional, aesthetic and economic Different dimensions proportional, In this paper, the adoption of the shape of a rectangle with proportionality 1 to 2 and 50 sqm an area (5 m× 10 m) , using the variable resulting from previous studies has been producing alternatives design depends on the flexibility and as a form of measurement (Table 1), as shown in (Figure 6) Because of the large number of measurement table will be the inclusion of a single model for each case.



(Figure 8) Basic model of the housing unit. (refer.: researcher)

This paper is an attempt to fine the best strategy of design a compact space but with full efficiency in economic and Functionality performance of the building , below some samples of 10m X 5m area designed by using the element of flexible space (as plan and sections) .(Figure 9) (Figure 10)



(Figure 9) furniture and space can transform as the functions (refer.: researchers)

- Siegesmund, S., Török, A., Hüpers, A., Müller, Chr., Klemm, W. (2007). Mineralogical, geochemical and microfabric evidences of gypsum crusts: a case of study from Budapest, Environmental Geology, vol 52(2), pp. 385-397.
- Teutli León, M., Jiménez Suárez, G., Peláez Cid A. A., Lozano Mercado, J., Posada Sánchez A. E. (2010). Rainfall chemical composition at Puebla, México. Enlace Químico, vol 2 (9), December 2010.
- Török, A. (2008). Black crusts on travertine: factors controlling development and stability. Environmental Geology, vol 56(3-4), pp. 583-594.

Study of Tehran historical district in Responding to the Earthquake (Case study: historical district of Tehran city)

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ABSTRACT

Part of Tehran's city, as Iran's capital has valuable historical district with different uses buildings such as: commercial, cultural and etc. that plays crucial role to city livability in this historical district of urban space. On the other hand because of most districts of Tehran is located on seismic faults, so it's a disaster-prone city. Since one of the important criteria in livable city is attending to historical and cultural texture, so this paper attempts to investigate the ancient district of Tehran to prepare the historical and commercial buildings in responding to earthquake.

In this regard, to achieve the desirable results, global experiences and related literature are studied. at the first step, the physical-spatial vulnerability characters of historical district is assessed and then effective indicators of urban that related to this historical district will be extracted .Methodology that used in this paper is qualitative and with using of SWOT technique, investigates the status quo and finally with the potential of the site, solutions for vulnerability mitigation are given in exposing of earthquake treatment. It seems that to respond heritage buildings to earthquake in historical district, evacuation plan should be consider in urban plans to improve livability in the city.

Key words: *historical district, vulnerability, evacuation plan, livable city, earthquake, mitigation*

INTRODUCTION

Tehran is the capital of Iran. In addition, in the light of seismic faults, it is earthquake prone city. Besides, Tehran is a crowded city which have been extended from the historical district. The historical core of the city is explaining the Tehran identity for present and future generations. Unfortunately during last decades, spatial and physical dimensions of this zone confronted with uncoordinated and garbled changes. Therefore, the quality of space, function and its environmental factors have been decreasing gradually. While these changes do not fit the new urban, further city could be vulnerable against earthquake. Once earthquake happen especially in vulnerable zones, many tangible problems appear. Relief measures began quickly to survive affected people. In this respect, there is remarkable relationship between amount of casualties and time-consuming relief measures. It is noticeably serious process when the texture of city is old and compact. Therefore, preparing city in respond to earthquake should be overemphasis which lead to safe and low vulnerable cities. With regard to longstanding consequences of affected communities, this paper endeavors to recommend beneficial and operative recommendations to safe old texture by minimum interfering. The main purpose is reducing vulnerabilities of the ancient district of Tehran, so the research objective is facilitating the relief helps

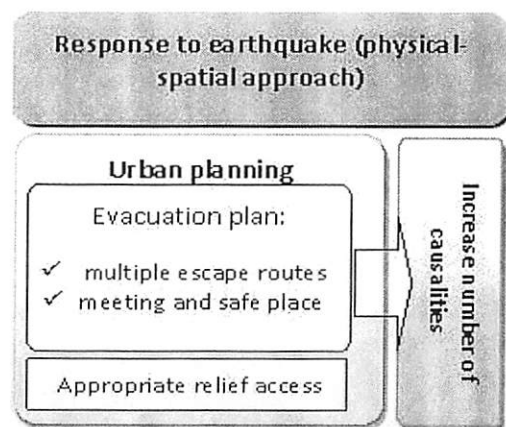
after earthquake In this regard, at the first step, relevant global studies are discussed concisely to extract urban vulnerability characters. Then, vulnerabilities of study area are analyzed by defining relevant categories. At the third step, solutions would be addressed, ultimately, based on sites features, overall evacuation map recommended to settle people at the safe place after rescue.

STUDY CONTEXT

Global experiences indicate that the inverse effects of natural disasters have been increasing dramatically in last decades. It seems that, Cities which are highly vulnerable to natural crises and disasters can quickly lead to serious emergencies situation. In this regard, Prepare city to disasters such as earthquake is a backbone of vulnerabilities reduction. Although, vulnerability reduction includes complicated and overlapping dimensions, it seems that urban planning on the ground of disasters beside other up-down modifications solutions, play key role during respond phase to minimize the required time for the affected population after earthquake. The planning process had a profound impact on the emergency management. On the other hand, associated studies have been done to clarify urban vulnerabilities mitigation in respond to earthquake by relevant researches.

"When a disaster event such as a flood, earthquake or hurricane occurs, the first responders to this event are always local police, fire and emergency medical personnel. Their job is to rescue and attend to those injured, suppress fires, secure and police the disaster area and to begin the process of restoring order. They are supported in this effort by local emergency management personnel and community government officials." (Coppola, 2011) Additionally, urban emergency evacuation mapping improves the efficiency of large evacuation operations in critical situation especially in the context of organic and complex texture. "The final product of an urban evacuation mapping program is a series of maps covering pre-established evacuation "zones" within the targeted urban area. Each map displays command, tactical, and logistical cues along with critical community information, such as locations of care homes and schools" (E. Baldwin, 2010).

Identify evacuation zones is crucial process that provides proper and appropriate routs which could be lead crowds follow to safe places. "Primary evacuation routes and plan for needed traffic control and ingress/egress control points. Locations for placement of unstaffed barricades or staffed vehicles can be identified" (E. Baldwin, 2010) In this regard, it seems that define zone based on their local and social characteristics could be considered practically to achieve the efficient consequences more ever; to create an initial draft map in response to disasters. "Transportation, access, and mutual aid issues may also be factors in determining how evacuation zones are defined and grouped together on individual maps." (E. Baldwin, 2010)



References: Authors

According to the chart, it has been concluded that there are two main urban aspects which resulted little number of casualties in urban areas after earthquake and mitigating negative outcomes. Set evacuation draft map to guide people in the safe places, also provide proper access to relief groups due to reach damaged zones." An emergency evacuation plan has two parts: evacuation from your house, and evacuation from your neighborhood."ⁱⁱ Evacuation routs should be informed to people of community. As an instance, "the city of Charlotte and its partner agencies developed a Center City Evacuation Plan to

guide you [citizenry], both in planning and actual evacuation of the Center City should the need arise. The plan provides general guidelines for rapid evacuations by vehicle and on footⁱⁱⁱⁱ Therefore, multiple escape routes from area; and a meeting place could be considered in evacuation plan. In respect to urban modification, it seems that there are some issues which would be take into account to increase a number of casualties. The vulnerability issues such as texture permeability, access hierarchy and secure wall of Street play an important and crucial role in decreasing casualties; more ever, relief to victims faced with less difficulties, especially in high density population of city(historical, old,). Additionally, it seems that there is a relationship between urban texture legibility and locating safe places by people after earthquake. To shed a light on it, health centers, police stations, fire stations and safe places would be recognized by people in emergencies.

RESEARCH METHOD

This is an analytical research of the ancient district of Tehran which study the urban vulnerability against earthquake. In this regard, two important questions raise as follow;

- 1 Which part of old district is more vulnerable?
- 2 What is the weakness points and potential of district to recommend evacuation plan and relief measures?

Methodology that used in this paper is qualitative and with using of SWOT technique, investigates the status quo and finally with asset basis approach gives solutions for evacuation plan of historical district in exposing of earthquake treatment. To determine the analytic model, The authors consider that their concepts and aspects in table 1 would be efficient to begin the analysis of vulnerability characters (physical , spatial, visual, and natural)in responding to the earthquake in the historical district, that have been shown as following table:

Table 1: analytic model

Vulnerability characters	Vulnerability indicators		Vulnerability Measures	
Physical	Morphological indicators	Urban texture form		
		Parcel orientation		
		parcel	grain	
			forms	
	dimension			
	Disposition	Mass and space		
		Occupancy area		
	Zoning ordinance ✓ Density ✓ land use	Floors		
		Fire station		
		Hospitals		
		Police station		
	Infrastructure	Gas station, line		
		Power station and power line		
		subway		
Communication	Surface Water			
	Telecommunication	Phone Booth		
		Department of Telecommunication		
Spatial	Permeability	Accessibility	Public transportation	
			Parking	
			Urban node	
			Open space	
			Pedestrian	
			Public space	
Visual	Urban landscape	legibility	Enclosure	
			Materials	
			Sight line	
			Opening	
			Landmark	
			Entrance	
			nodes	

References: Authors

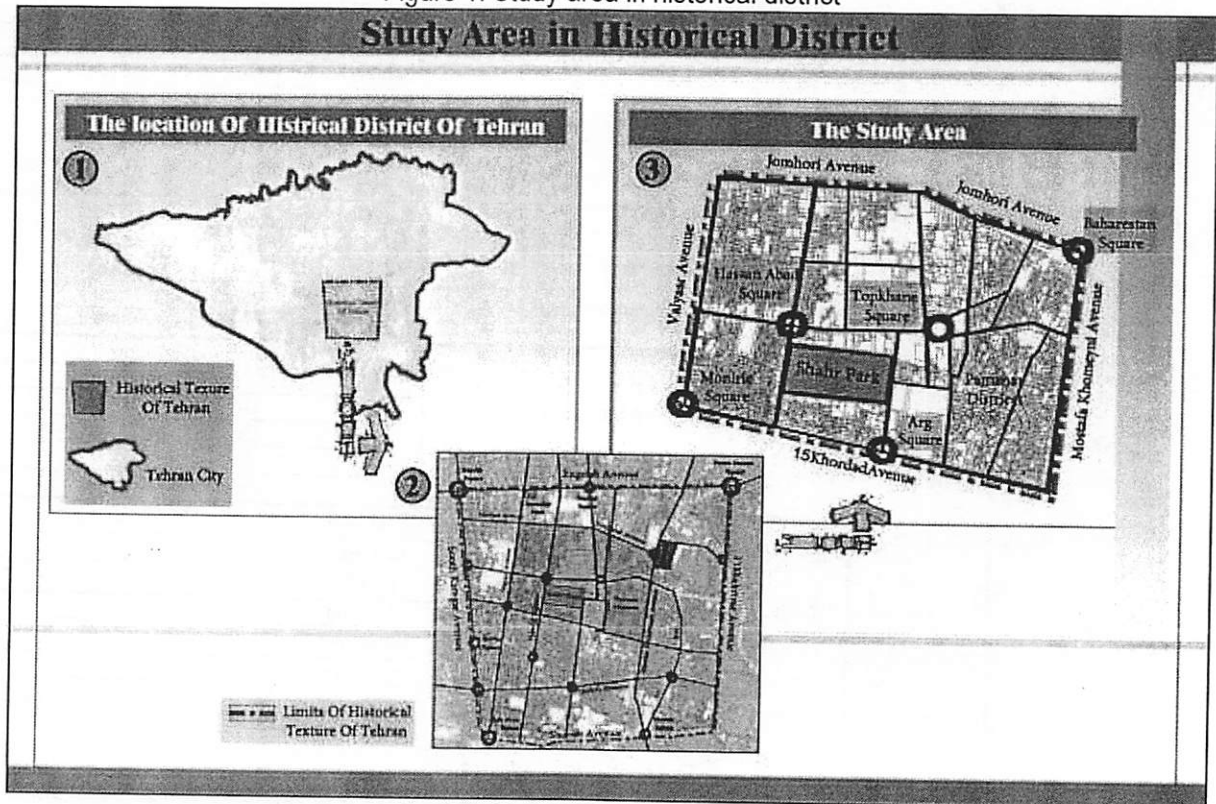
Assessment criteria of physical character at the overall level are morphological indicators, zoning, topography, infrastructure, communication and mean masons structures .These criteria in the pattern of blocking and street-building, form of pathway lines, the index of blocks dimensions are determining in the pattern of movement in the city texture communications, and even regulator of components and elements of future developments. Morphological criterion at the detailed level is clarifying the grain pattern, indexes of pieces and their forms. In the density concept, indexes of occupation level, number of floors, and the compositional index of constructional density as criterion. These characters somehow can be influence on both mitigation and increasing the historical district vulnerability.

Assessment criteria of the spatial character at the overall level include permeability that has a very vital and important role in vulnerability mitigation of urban district in accessibility to the inner area especially after disaster for relief and etc. criterion urban nodes, open spaces, public transportations are determining in the pattern of movement in the city. Assessment criteria of visual character at the overall level is legibility and criterion such as entrance, landmark, opening and sight line would be surveyed as one of the most important aspect of vulnerabity mitigation in respond to the earthquake in historical district. In continue, these vulnerability characters and their indicators are investigated in study area and related maps are presented for more delicate description.

STUDY AREA:

The considered area in this paper, is part of historical district of Tehran city (as an Iran capital) in part of 11 and 12 of urban regions. It is the historical core of Tehran with administrative, commercial, residential and services buildings that includes noticeable landmarks.

Figure 1: Study area in historical district



References: Authors

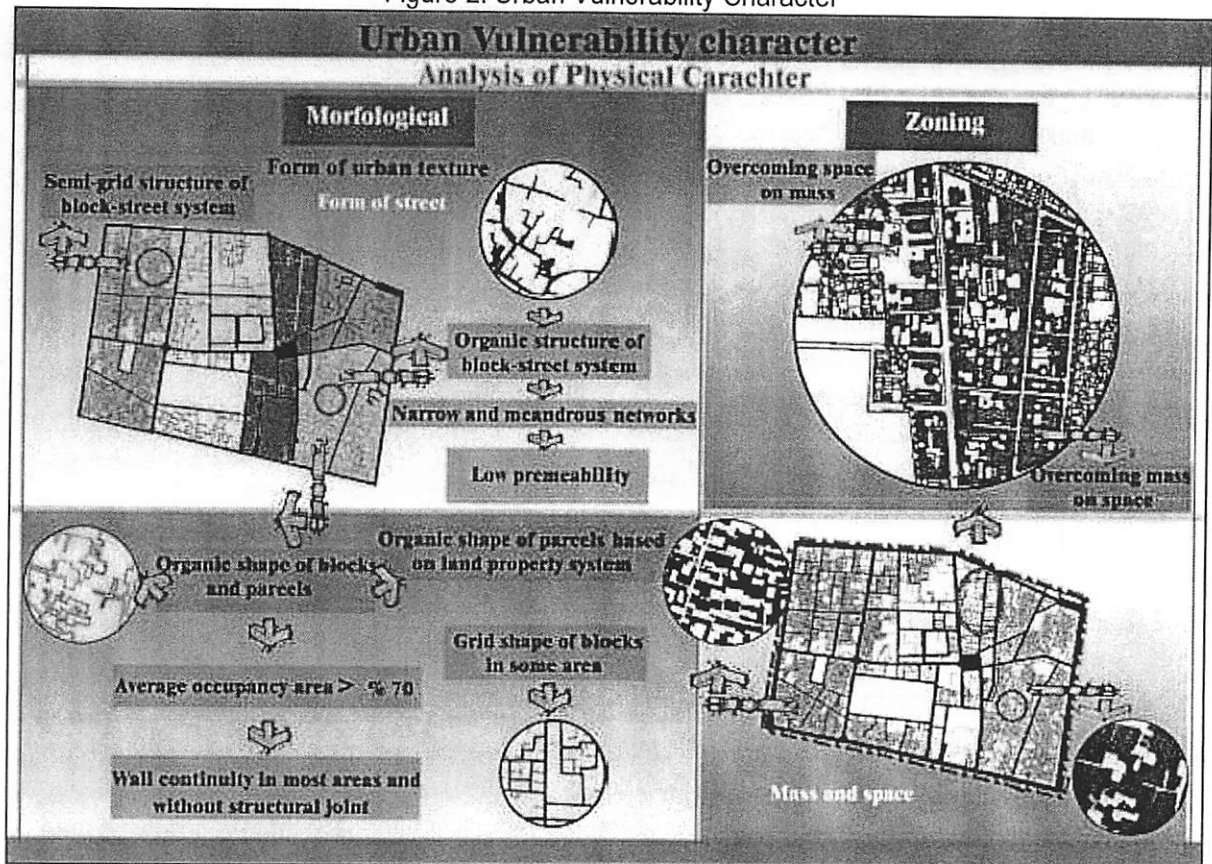
In regard to the above map, the location of historical district is shown in Tehran city in shape one (1). The core district is approximately in the middle of Tehran city. In shape two (2) this area is distinguished with its squares and streets. At the end, in shape three (3) the study area with its urban components are shown.

ANALYSIS OF VULNERABILITY CHARACTERS OF THE HISTORICAL DISTRICTS:

1. Physical Characters:

Urban texture of this site is combining of different kinds of forms and it resulted variety of permeability and mass and space. The following map shows the analysis of the physical character for the study area. Organic texture is dominated on the east part of the site that cause narrow and spiral Street. Additionally, compact texture and small grain pattern resulted impermeability texture in this part. Besides, high density leads to overcoming mass on space.

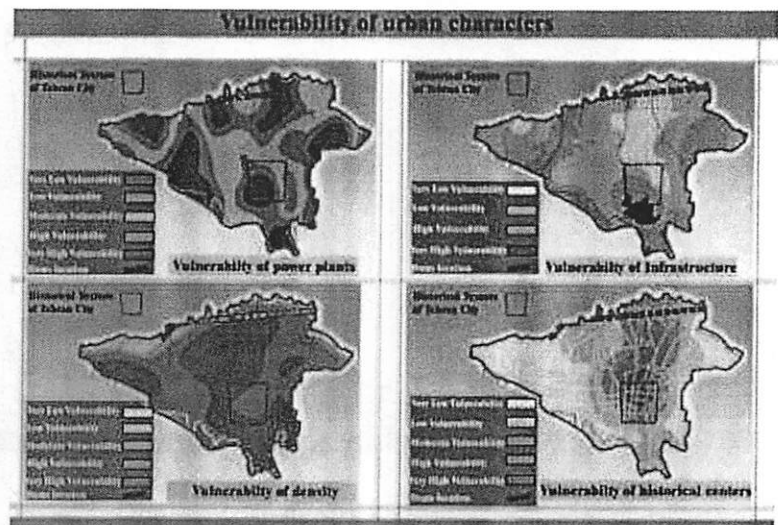
Figure 2: Urban Vulnerability Character



References: Authors

In the middle of the site, more open spaces could be seen. So space is overcoming on the mass and the permeability degree is increased in this area. Grid and semi-grid shape of parcels and blocks are the texture form of this part. In the west part of the site both grid and semi-grid structure of block-street existed. Relatively suitable permeability in most part of this area is existed. Although the south part of district, challenging to numerous difficulties. The biggest of these problems is lack of balancing between occupied areas and open spaces.

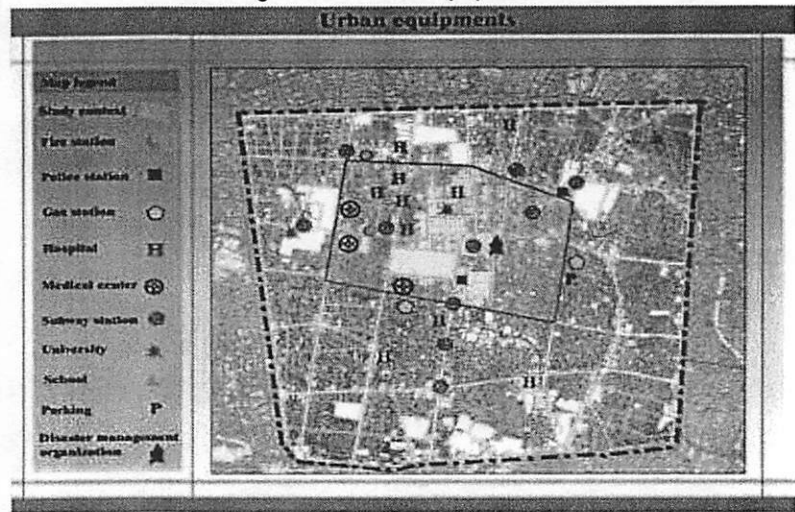
The GIS analysis (figure 3) indicates that vulnerability of power plants in study area is more serious in comparison with surrounded zones. Based on relationship between density and vulnerability, the high density of power plants increasing the vulnerability. In addition, vulnerability of infrastructure in this zone is considerable due to high density of infrastructure and old materials. Historical centers is more than other zone and the settle and business population is notable which vulnerable the site.



(References: Authors)

To mitigate the scale of crisis, some uses have profound effect on after disaster situation. There are enough hospital and health centers in district, but all of them concentrate at the grid and semi-grid zone. So the lack of health center in compact texture could be challenged people after disaster. It is most crucial in impermeable texture. It is why access to health centers faced to difficulties after earthquake. The issues of fire stations and police stations are same to health center.

Figure 4: Urban equipment

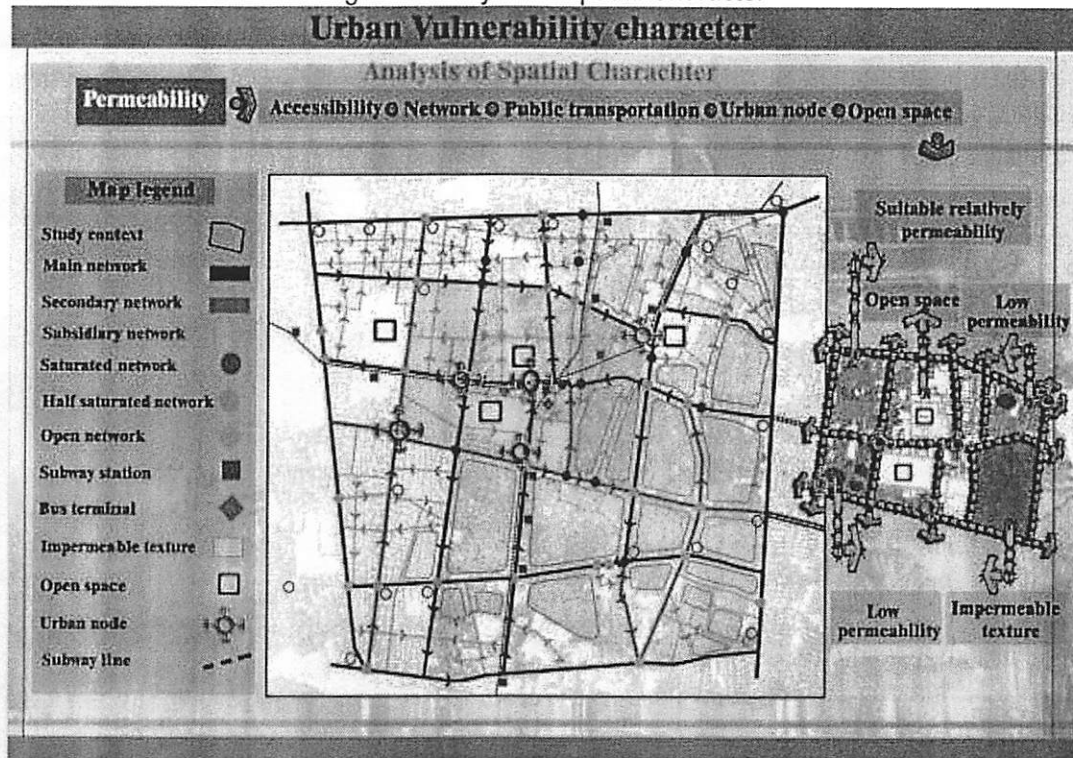


(References: Authors)

2. Spatial Characters

With the focus of surviving affected population, Permeability role should be addressed as a sophisticated issue after earthquake in relief aid. To shine a light on this topic, it could be said that, structure of networks system and the level of their accessibility to the different location of the site are some factors that have a crucial effect on vulnerability reduction after disaster. The following map shows the analysis of the spatial character for vulnerability of study area.

Figure5: Analysis of Spatial Character



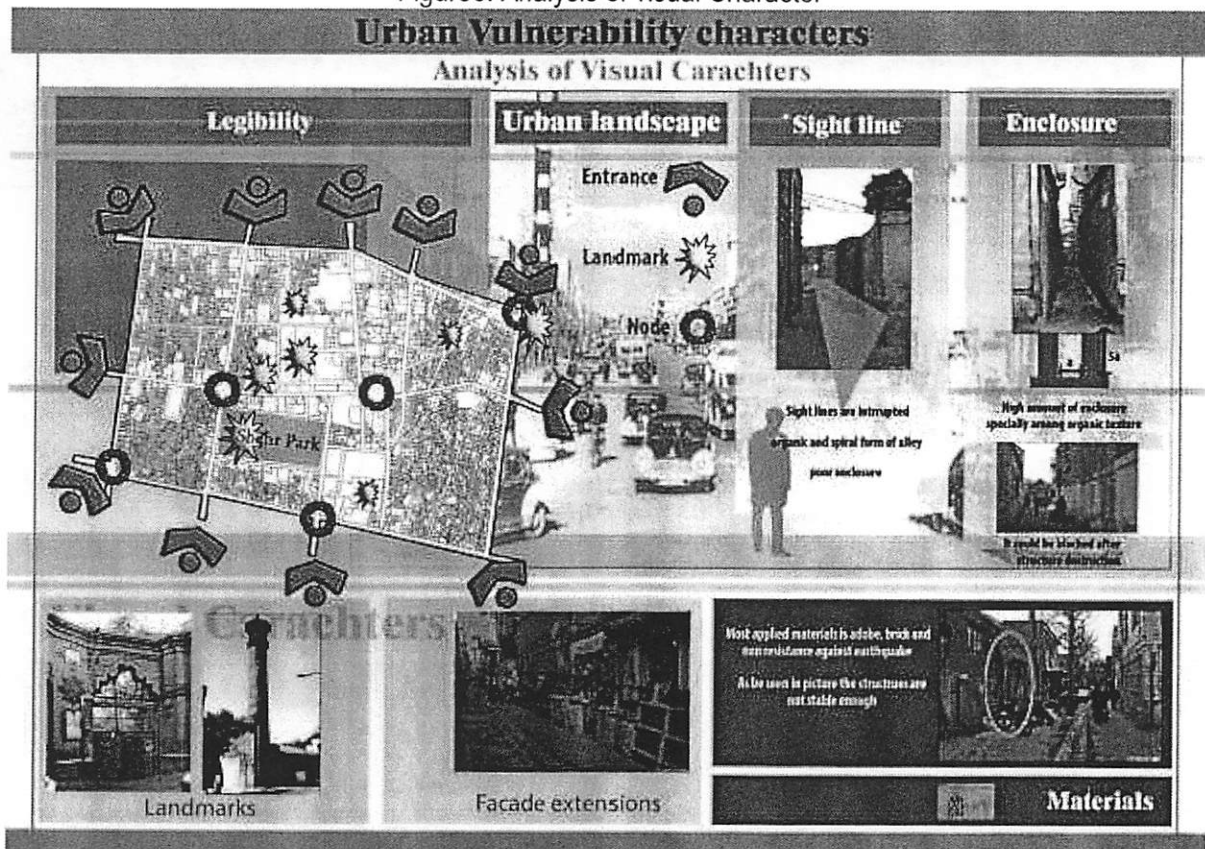
References: Authors

In relation to this map, it is crystal clear that the east part of the site is low permeable texture; especially the south-east part of the site is impermeable to access vehicles. In the middle of the site, some open spaces could be seen that can support the permeability of the area. The above map (figure 5) demonstrates that the west part of the site is better than the east part of it from the point of view of access network. Existence of some open spaces and grid and semi-grid texture in north of this part, can resulted in suitable relatively permeability texture. But to be in line with the compact texture of the south part of it and low accessibility to the middle of it, low permeability could be observed in this part of the site.

3. Visual Characters

Post-disaster vulnerability in compact and old settlements requires that close attention be paid to the visual urban conditions that led to better routes recognizing by people and Withstand efficient the natural hazards confronting the district. As an instance mind map and landmarks provide quick choose to safe zone. Therefore, both visual indicators and evacuation map could be taken in conjunction. In this part visual characteristics legibility, sight line and enclosure, land marks, façade extensions and the visual effect of entrances have been discussed.

Figure6: Analysis of visual Character



References: Authors

According to above map, there are several distinguish land marks, which promote the access recognition of people in crisis situation. Most importantly, there are open areas with land marks which are familiar to victims. On the other hand, to address the challenges of vulnerabilities, sight line could be adapted to evacuating routs. Although, in compact and organic texture local people can pursuit correct in the light of previous visual perception of site, but in low enclosure access especially which surrounded by poor quality of materials could block the access way. In addition interrupted visual sight line and spiral routs could conclude low legibility of blocked routs after destruction. It seems that south-east of site, because of interrupted sight line people recognize open rout after earthquake hardly and in a longer time.

4. SWOT Technique

The study area is special because of particular visual perception and different urban texture. In this regard, to evaluate the vulnerability of the study area the indicators are classified into four main categories. It contains physical, spatial, visual indicators which could be investigated in disaster situation. Strengths, Weaknesses, Opportunities and Threats of all indicators evaluated as a SWOT technique to analysis the internal and external factors that are favorable and Unfavorable to recognize both the vulnerability aspects of texture and exist potentials open to risk reduction. These have been shown in more detailed as following table:

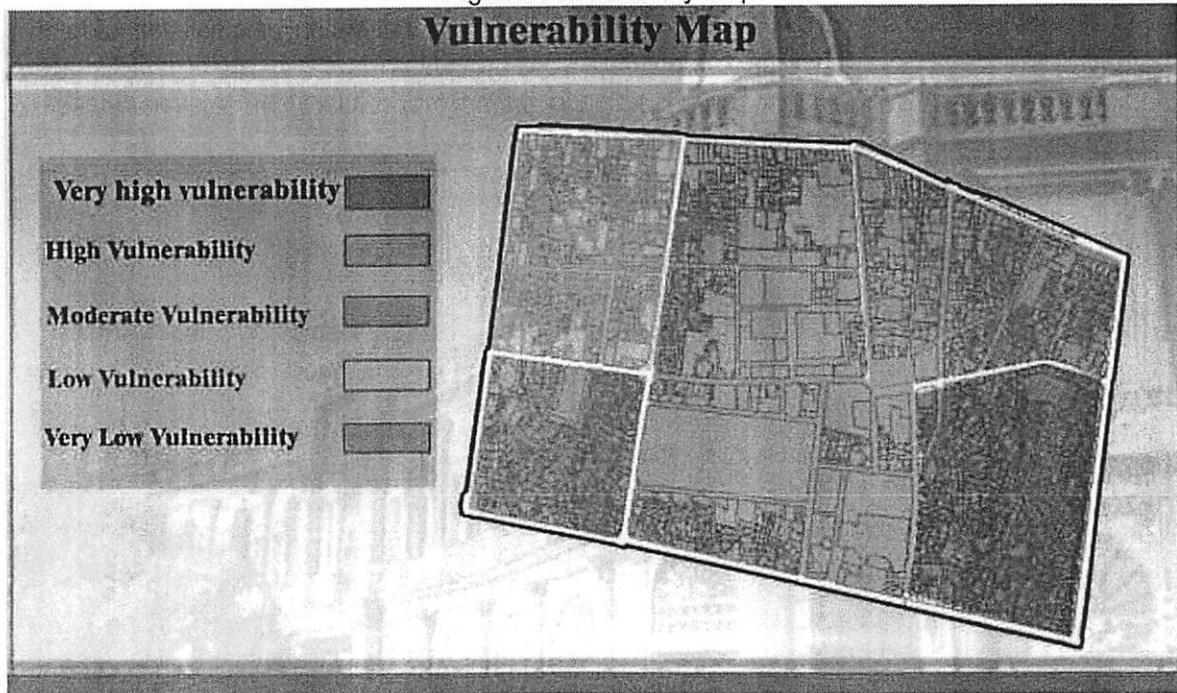
Table 2 SWOT technique

Strategic analyze of vulnerability					
Vulnerabilities indicators		Strength	weakness	opportunity	treatment
Physical Indicators	Morphological indicators	<ul style="list-style-type: none"> Adequate number of hospitals (health center) Small number of gas stations 	<ul style="list-style-type: none"> Usage of poor quality and traditional materials in old texture. Usage of inappropriate materials in new and recent buildings such as stone, glass and etc. 	<ul style="list-style-type: none"> Issues which are Considered in urban detailed plan: 	Possibility of increasing population and buildings density that recommended by urban detailed plan
	Zoning ordinance	<ul style="list-style-type: none"> The existence of Multifunctional Disaster management bases 	<ul style="list-style-type: none"> Improper performance of materials, especially on the façade of the buildings such as doing wall pie to fix stones. 	<ul style="list-style-type: none"> ✓ Absorbing wells for sewage disposal ✓ Equipping and 	
	Infrastructure		<ul style="list-style-type: none"> Concentration of health centers at the west part of are that is far from old and organic texture. Inadequate fire station in crisis situation. 	<ul style="list-style-type: none"> retrofitting of vulnerable buildings against disasters ✓ Study of historical buildings to retrofitting them 	
	Communication		<ul style="list-style-type: none"> Low resistance structures of hospitals against earthquake Low capacity of communication network time-worn urban infrastructure networks 	<ul style="list-style-type: none"> against disasters 	

Spatial indicators	Permeability	<ul style="list-style-type: none"> • Existence of landmarks which resulted legibility of the district. • BRT routs play a crucial and important role to relief service after disasters. • Existence of subway routs • Low urban transportation at night 	<ul style="list-style-type: none"> • Low permeability because of compact texture. ✓ Does not allows fire stations service to the compact area after disaster. ✓ Does not allows police access to compact areas. • Poor access to main network, because of organic texture. • High level of enclosure, especially in the organic texture • shortage of open area in Neighborhoods • the disruption of pedestrian and streets networks • Congestion of population and vehicles 	<ul style="list-style-type: none"> • Issues which are Considered in urban detailed plan: ✓ routs widening ✓ Organizing public spaces and developing public areas. ✓ Development of public access networks ✓ Increasing permeability and providing access roadway into a city blocks ✓ Emergency access to vehicles, 	Lack of enough parking spaces which resulted occupied network in emergency situations. Moreover, relief activities would be faced difficulties
	Enclosure				
indicators	Urban landscape	<ul style="list-style-type: none"> • Existence of too many landmark • Existence of landmarks 	<ul style="list-style-type: none"> • Interrupted sight line in organic texture • High amount of enclosure in some part of district • Façade extensions could block the routs 	<ul style="list-style-type: none"> • Upgrading the quality of architectural buildings • designed Texture of study area new zone 	Block suitable sight line due new construction

According to above table, it has been concluded that study area includes drawbacks and serious weak points which cause high amount of vulnerability among texture. These features interrupt relief access both by foot and vehicles after disasters, so the emergency actions face severe problems. On the other hand, distinguishing features as a strength points and opportunities provide rescue assistance and emergency evacuation that would be more effective in response phase. In order to evaluate the vulnerability of study area, analysis of GIS map, SWOT table and detailed urban map have been applied in create vulnerability map. The extract indicators considered expertly by study which attempts save the lives of innocent victims more than others in desired site after disasters.

Figure 7: vulnerability map



References: Authors

As it shows, the vulnerability levels are classified into five groups. The brown color at the east part of the site is the most vulnerability area and the violet color in the middle of the site is the least vulnerability zone. High vulnerability is related to the green color at west part of the site and low vulnerability is related to blue color. The red color at the east of the site is vulnerable moderately.

SUGGESTED SOLUTIONS AND POLICIES FOR VULNERABILITY MITIGATION

It seems that to increase the capacity and resilience of study area the role of urban planner as solution recommender is weighted. Virtually, mitigations largely based on long-term planning and continuity of executive actions. In this regard, with considering to continuity and covering of detailed plan, more ever by focusing on studying the status quo and extract analytical conclusion of the SWOT technique, solutions recommended as bellow:

- Physical indicators:

Solution:

- ✓ Rehabilitations, regeneration, revitalization of old texture according to planning policy statement
- ✓ Retrofitting buildings in the old texture, according to the last guidelines and national regulatory issues of buildings.
 - ✓ Rapid assessment of existing hospitals and health facilities for structural damage
 - ✓ Legal enforcement of seismic building code
- ✓ Retrofitting buildings and main equipment and infrastructures of the district.
 - ✓ Design and construct earthquake resistant building
- ✓ Appropriate distribution of uses and transfer the vulnerable uses from the district.
 - ✓ Formulation and Implementation of land use and building by-laws (action)

- ✓ Displacement and transfer the nuisance activities such as: warehouses, peddler and etc to out of the area and recycling these lands for more efficient service uses.
- ✓ Decreasing the physical density in high density areas and balancing the mass and space due to decreasing urban vulnerability.
- ✓ straight visual Continuity of structural elements
- ✓ Using variable structures and materials to building enforcement
- ✓ Establishment of Disaster Management System in vulnerable areas
 - ✓ Utilizing the resistant and lightweight materials
- ✓ Re-establishing of normal communication system as soon as possible
 - ✓ Establishing of temporary systems until permanent repairs can be made to make the networks operational.

- ✓ Emergency communication setup
- ✓ Setup emergency wireless communication

- ✓ Controlling haphazard and irregular construction
- ✓ Controlling for the provision of open spaces, connecting road, ground coverage
- ✓ Set back urban wall in low permeability access
- ✓ Controlling for building regulations through provision floor area ratio, maximum height and story, interior planning
- ✓ Equip of old texture to disaster management organization
 - ✓ Early warning system
 - ✓ Pre-positioning of response and relief supplies
 - ✓ Pre-positioning of relief supplies in strategic locations in warehouse, containers, distribution to stakeholder organizations

- ✓ Equipping and repairing the based Lighting in inner area of old and historical texture for increasing the security.

- ✓ Identify evacuation sites
 - ✓ Equipping the safe evacuation areas.
 - ✓ Identification and mapping of staging area, evacuation area

▪ Spatial indicators:

Solutions:

- ✓ Improvement of transportation networks
- ✓ Increasing the permeability of old texture
- ✓ Increasing the legibility and general understanding of networks.
- ✓ Identification of evacuation routes
- ✓ Improve pedestrians movement facilities
 - ✓ Organizing the pass ways and opening the barriers (Obstacles) of crossing in old and historical district for possibility of passing the emergency and relief cars.
 - ✓ Improve legibility of public space to orienting evacuating routs after earthquake
- ✓ Enhancing the old texture permeability by increasing the area of access way to 30% of total of district
- ✓ Geometric correction of site Intersections

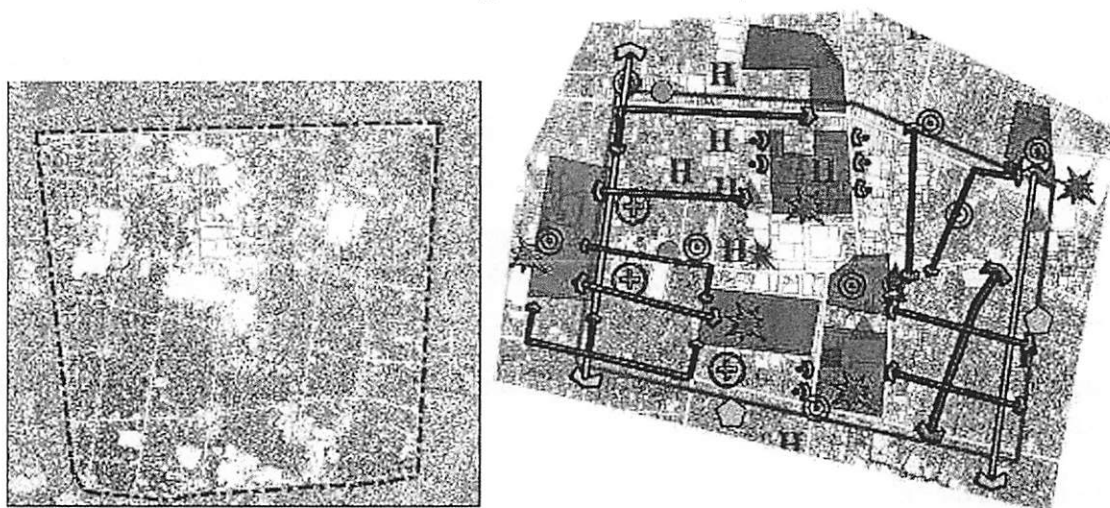
- Visual indicators:

Solutions:

- ✓ Using city symbols and element for defining space and promoting the legibility
- ✓ Definition of entry and exit gates
- ✓ Creation of geometries that could be recognized in mind
- ✓ Improve the legibility of landmarks and using them for solidarity of urban form
- ✓ Modification of suitable urban enclosure to emergency evacuation
 - ✓ Setback of exterior walls in compact texture
- ✓ Omitting the inappropriate interpolations and organizing the interpolations of status quo.

Finally, the following section traces post-disaster evacuation map. The main aim of producing evacuation map is demonstrate principal access to predicted open areas, more ever it provides better access of immediate humanitarian relief to effected zone.

Figure 8: evacuation map



References: Authors

As be seen in above evacuation map, several open spaces that most of them include landmark recommended as a public space in emergency situations. Besides, main accesses are considered; they have permitted the large population to bridge across the compact zone. Uses with open space could be flexible and equipped for emergency shelters or a place for distribution of first aid and necessary needs. What is prominent is providing both proper access to affected area by relief groups and evacuating routs for people who want achieve to safe place.

CONCLUSION

This research reveals that, usually there is high mount of vulnerability in old and organic texture that can affect old district after earthquake which leads to increasing causalities and other social and physical problems. More ever, offering urban technical suggestions could be efficient in bridge a gap in disaster situation and respond phase. It facilitates relief and emergency evacuating by modifying weakness points of old texture and applying potentials. In the case study analyzed here, many

significant urban indicators have been taken into consideration to mitigate vulnerability. The research demonstrates that there is notable gap in urban detailed plan in Iran. In this regard, since the old district is so vulnerable, it is strongly recommended that evacuation map add as a necessary strategy in detailed plans, also urban planners, urban designers, architectures are urged to adapt their idea according to evacuation map.

REFERENCES

- Allan, P., & M. Bryan. (2010). The Critical Role of Open Space in Earthquake Recovery: A Case Study. *Victoria University of Wellington, Wellington, New Zealand.*, 34-43.
- Anderson, S. 1978. *On streets*. Cambridge, Mass.: MIT Press.
- Consultant, B. (2007). *report of detailed palm of region 12*.
- Coppola, D. (2011). *the importance of international disaster managment studies in the field of emergency manage*.
- E. Baldwin, .. R. (2010, May). Guide to Urban Evacuation Mapping. *RiskMAP, Federal Emergency Management Agency Region IX*.
- Godschalk, D. R. 2003. Urban hazard mitigation: creating resilient cities. *Natural Hazards Review*, 4: 136-143
- Guzzetti, F. (2008). *Book Review of "Measuring Vulnerability to Natural Hazards"*. CNR IRPI, Perugia, Italy: Natural Hazards and Earth System Sciences.
- Keeler, C. A.-. 1906. San Francisco through earthquake and fire. *San Francisco earthquake and fire digital collection*. Berkeley: The Bancroft Library, University of California.
- Pollack, L. 2006. The landscape for urban reclamation. *Lotus International*, 128.
- Swanick, C., Dunnett, N. & Woolley, H. 2003. The nature, role and value of green space in towns and cities: an overview. *Perspectives on urban greenspace in Europe*. 29: 94-106.
- University, T. (2010). *tarh e samandehi, nosazi va behsazi- khiaban haye lalezar va ferdosi*.

ORGANIZATION OF THE HOUSE ON GENDER BASED batik craftsmen in PROTO PEKALONGAN

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ABSTRACT

The production of batik cloth is made by the women to use the house and yard as a production process; these conditions cause problems for spatial planning and environmental degradation. Open a business at home allows women to take time for family, start a business from home; women can have more time to do household chores. Therefore, if women started businesses from home, than in accordance with the nature of women to carry out the obligations of the management of the household. The methodology used in this paper is a qualitative method that reveals the meaning phenomenology paradigm based on phenomena that exist in the field and then the sample was taken of houses used as batik industry with sampling methods and data mining through interview techniques. The results of this study are expected as a reference for planning and housing development by both government and the private sector to pay more attention to the activities of the dominant actors in residences is a woman who is the subject is, not an object in development. Thus creating a flexible home-based business as a gender.

Key Words: home stay, gender, environmental quality

INTRODUCTION

Batik is one of Indonesian culture results. Existence of batik fashion world is never lost. Every region in Indonesia has the hallmark of different batik. Pekalongan is one of the biggest batik producers in Indonesia. Batik production from pekalongan famous in the world. Proto is a village in the region of Pekalongan where there batik home industry. Batik is local culture as a heritage is hereditary, so the region is known as the "kampong batik". Batik artisans in the Proto village are all women.

Women in the Proto village Pekalongan, become batik artisans other than as a culture from generation to generation as well as their livelihood to petrify the family economy. As a woman of course batik craftsmen can not be separated from the core work of the housekeeper. Utilizing the home as a workspace occurred in the village of Proto Pekalongan. Dwelling house used as a place to produce batik, although not alter the function and organization of the room, women perform these activities by utilizing the space and time to perform duties and responsibilities in her role as a woman and as entrepreneurs.

Production of Batik carried out by the women in the village of Proto pekalongan using spaces in the house and yard as a place of production process, these conditions cause problems for their

organizations space and environmental quality. From the description, it is necessary to research on the organization of space in the village houses Proto Pekalongan is based on the existence of a condition in which the use of space in the dwelling house was also used as a batik production is done by women.

This study will use a qualitative methodology with phenomenologi paradigm in exposing existing problems. Phenomenologi paradigm of qualitative research in trying to understand the meaning (for meaning) of the event and its linkages with the ordinary people in particular situations (Moleong, 2001: 9). In other words, qualitative research is the research paradigm phenomenologi trying to uncover the meaning of the behavioral phenomena of human life, both in the capacity of human beings as individuals, groups and society.

Research Sites

Proto village is included in the district administration Kedungwuni, Pekalongan. The total area of the village of Proto ± 79 873 ha. The total area of the village of Proto is ± 79 873 ha, the area that is divided into multiple designation, such as the residential area of 33 ha, 28 ha area of rice fields, country estates 1ha of land, public facilities and grounds 1ha area of 16 Ha. Based on administrative data Proto village government, the population recorded by the administration as much as 1332 people, with the details as the male population is 1309 people and female population is 2641 people.

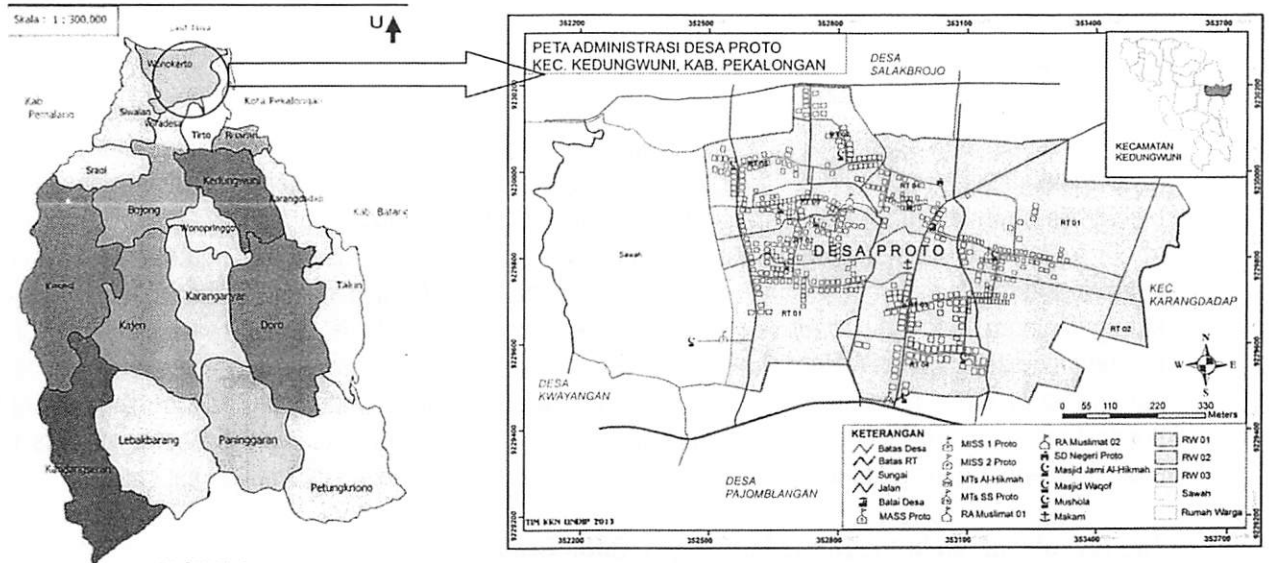


Figure 1
Map of village Proto Pekalongan

Proto pekalongan village famous for the local culture of batik. Work as batik craftsmen than as a livelihood as well as efforts to preserve the cultural heritage of Indonesia. Performers craftsmen, gender has more women, while men act as marketing. Potential of Proto village can be seen in the following figure:

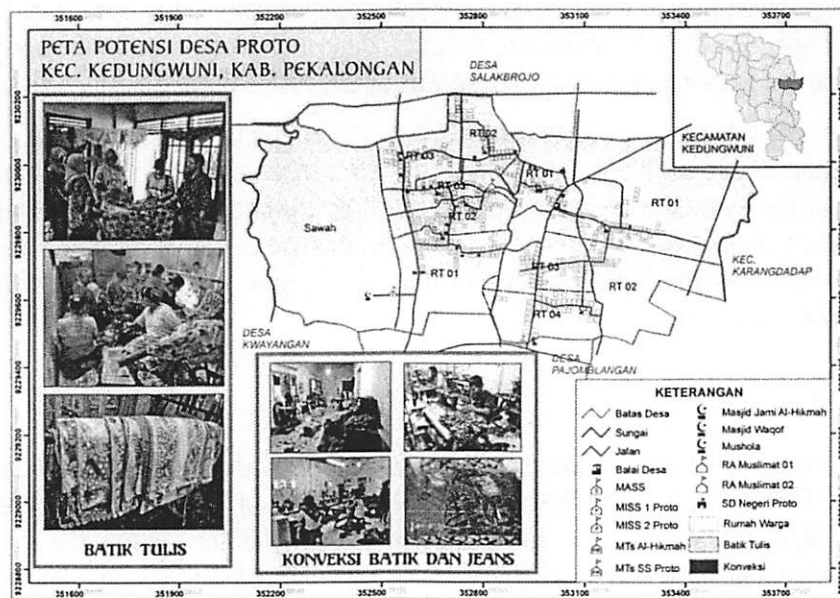


Figure 2
Map of potential in Proto Village

Gender and Space

Gender and space are associated with the complex way in the whole process of reproduction of social relations and property of the capitalist system. This phenomenon lies in the history, archeology precipitate physical and symbolic space, build environment, and build a city that reflects the architecture of our society that are not integral. As the environment has been established to reflect the social class, the neighborhood also reflects the gender of the occupants. Design space of the house is not only strengthening a statement about gender but also reinforces the ideas that these spaces will be room for the heterosexual family. Women have a longer time to activity at home compared with men whose nature is to make a living for his family. So women are considered more familiar with the state of the house than men. This suggests that gender roles can affect homes. In this case, woman as batik craftsmen and organize home more influence to organization's space in the residential space.

The role of women in the Home Industry of Batik Craftsmen

Open a home business allows women to take the time for a family, with starting a business from home; she can have more time to do household chores. Therefore, if a woman began to work in the house, she can perform household management duties. Women are the queen of the household and she can work to earn a living. Starting a business from home is also a significant savings, starting a business at home means reducing the need for the cost of renting or buying a place of business. Household responsibilities for women are: Maintaining and taking care of the household - making interior design, location and physical structure of the house to be an important issue for women in the sense that the house was not intended solely for men in the household (Woromurtini 2010). Seen from the theory of the existence of women in the home is more dominant than men. Thus the selection of homes as batik production house seems right because the proprietor is a woman, and the existence of the women in the house more to dominate the affairs of the house. Work is not a major barrier to carrying out duties as a woman.

Home as a residence and place of production influence the organization of space

Rapoport (1969) noted that the house is a form of institutions, not just the composition of materials and structures, but based on a purpose complex that shape and structure be greatly influenced by the cultural environment of the community. There is a relationship between behavior (behavior) and the shape of the building in two terms, namely: the behavior is important to understand the shape of the building, and building form is the embodiment of such behavior. On the other hand the form of the building will affect the behavior and views of community life.

The house is a form of institutions, not just the material composition and structure alone, but by a complex goal that shape and structure be greatly influenced by the cultural environment of the community. There is a relationship between behavior (behavior) and the shape of the building in two terms, namely: it is important to understand the behavior of building forms, building form is the embodiment of such behavior. On the other hand, Building Forms will affect patterns of behavior and views of community life.

Home as a place of production in the village of Pekalongan Proto affects the shape of home layout, especially the organization of space in it. Layout space in residences batik craftsmen can follow the behavior of the household. Now, what happen is the house of the craftsmen in the Proto village Pekalongan have no difference with homes in general, only residents add space on the back or side of their homes as a producing batik.

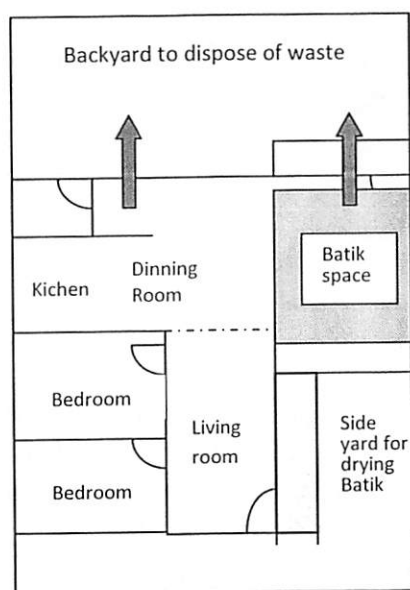


Figure 3
The House of Crasmen Batik
Sumber : Peneliti, 2012

Home as a place of production which made the women in the village of Pekalongan Proto affects the shape of residential buildings, especially the organization of space in it. Layout space in residences batik craftsmen follows the behavior of the household. Now what happens is the state houses in the village craftsmen Proto Pekalongan has no difference with homes in general, only residents add space on the back or side of their homes as a producing batik.

The addition of space at the back and in addition to their homes as possible the reason is proprietor of batik artisans are women; thereby increasing the space on the back or side of the house meant close to the core of women's space is the kitchen. So that a woman who worked as craftsmen batik does not leave the nature as a woman, that is taking care of the house, especially cooking. In addition it is possible the privatization of production space so that women have the freedom to work (producing batik) without having to use the space in their core houses. This is reinforced by the theory

Dephne Spain (1992), which proposes that a gender that is has a message about space, where there is a division of roles between men and women.

According to Ching (1991) How to prepare spaces may explain the relative importance and function as well as the symbolic role of these spaces in an organization buildings. Placement of production space at the back or side that does not mean the level of room production become not important, but the space can be defined structure that describes the role of a batik craftsman who is also a woman that realizes the importance of household affairs, so precedence over employment matters.

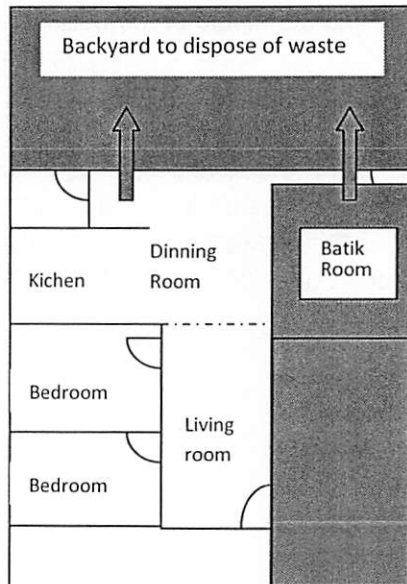


Figure 4
Space for production
Sumber : Peneliti, 2012

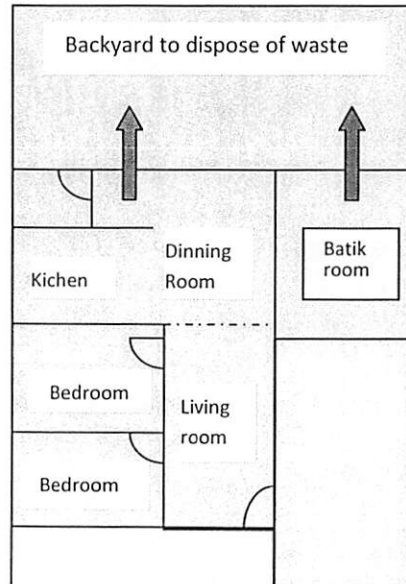




Figure 5
Zone of Gender
Sumber : Peneliti, 2012

Exp:
 Space for Production
 Zone of Gender

Seen from Figure 5 that a woman as dominant figure of the house can be defined as all activities are in touch with home. Women have almost all the activities associated with the spaces in the house. While seen in Figure 4 production space in backyard and side yard so that women batik craftsmen still have privacy in their work and do homework.

In environment of the village Proto Pekalongan, almost all houses have similar residence, which has an additional building for the production of batik. Sequence of their living space of the house also has a resemblance to this case can be interpreted if the household has the same activity, then it will have the same type of houses, according to the theory Ching (1991) which says any type of organization space preceded by a section discussing the character shape, relations and environmental responses in that category.

Environment is also one of the discussion in this paper, the Environment will determine the organization's of space house of batik artisans in the Proto Pekalongan village, Batik artisans have an open space on the back of the house is used as a waste dump output. Although the results of batik in home industry batik is not too much, but the results of batik production process waste is channeled into the backyard simply create environmental degradation. Waste disposal causes environmental well be contaminated. Placement of waste disposal behind the house is one way that the perception that a woman to mix batik waste as well as household waste.

CONCLUSION

Role of women in a dwelling a house is very important. Women have a higher level of existence in homes. Pekalongan Proto village famous as "Kampong Batik" is unique, because most women in this village livelihood as batik craftsmen. Batik work is their way upholds the local culture, which is passed down from generation to generation. Dual role as a woman and batik craftsmen make them choose to stay at home as a residence as well as production.

Make the decision to stay home of course make the system doubles the space organization of different batik craftsman house with residences in general. The addition of the building as a place of production occurred in the village of Proto Pekalongan. The addition of space occurs on the back or side of the house. Of the analysis showed that the addition of space behind and beside the house is affected by the production of women's user space. Fundamental duty of a woman is taking care of the house and dealing with the kitchen, the kitchen in residences typically found on the back or side of the house, so the addition of production space tailored to the space that is often used by women. Batik Waste disposal batik became one with the household waste also reflects that women who have the role of preparing the organization of space in the residence. It can be concluded that gender affects the organization of space systems, especially in this case is the home of batik in Pekalongan proto village where the proprietor is a woman.

REFERENCE

- Ching, Francis D.K. (1991), *Arsitekture : Bentuk, Ruang, dan susunannya*, Erlangga, Jakarta.
- Moleong, Lexy J. (2005), *Metodologi Penelitian Kualitatif*, Bandung: PT. Remaja Rosdakarya.
- WoroMurtini, Titien. (2010), "*Kesepakatan dan pemaknaan ruang gender pada rumah tinggal study kasus_ kauman semarang*", Disertasi Program Doktor Teknik Arsitektur dan Perkotaan Universitas Diponegoro.
- Rappoport, Amos. (1969), *House, Form and Culture*, New York: Prentice Hall, Inc.
- Spain, Daphne. (1992), *Gendered Space*, USA: University of North Carolina Press.

THE ROLE OF DESIGN IN PERCEIVING THE AUTO-BRAND BY THE VISITOR WITHIN THE AUTO-SHOWROOM

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ABSTRACT

Although a car is considered as a classical mode of transportation, but it has exceeded its role to become a social and personality status symbols. Auto-showrooms play a vital role in showcasing the cars. The automotive brand had become a major theme to design the auto-showrooms exterior and interior environment, The study aims to determine the role of design (as a set of visual elements) to express the place identity within the interior spaces for showrooms, and how design affects the visitor's perception. The researchers developed the observational techniques in performing this study. The findings show that design plays a clear role on the visitors' perception of showroom identification via highlighting the automotive brands.

Key Words: *Showroom Design/ Auto-show; Place Identity; Visitor Perception; and Auto Branding.*

INTRODUCTION

Three decades ago, there were a few brands for customers to choose from a few automotive companies. Those brands were well known for all, in characteristics, country of origin, value, quality and durability. The globalization leads to the rapid growth of trade, and mass markets which affects automotive field significantly. There are a lot of new multinational brands have been appearing in the market (Hanson, Mataloni, & Slaughter, 2004). They are compatible with well-established brands, by their attractive prices, high specifications and customer satisfaction services such as loan facilities and after-sales service. All these factors led to customer confusion in choosing the suitable vehicle, in addition to the economic crises affecting the automotive industry. Automotive industry is the second affected sector after the real-state, where the biggest brands such as General Motors, Chrysler, Ford and Saab were victim of the crisis after 2008 (Sturgeon & Biesebroeck, 2010). **The scope of this study focuses on the auto-showrooms as a field of study.**

In this study the fundamental objective is to understand the role of showroom design in visual perception of the automotive brand and place identity (by the visitor), as shown in Figure 1.

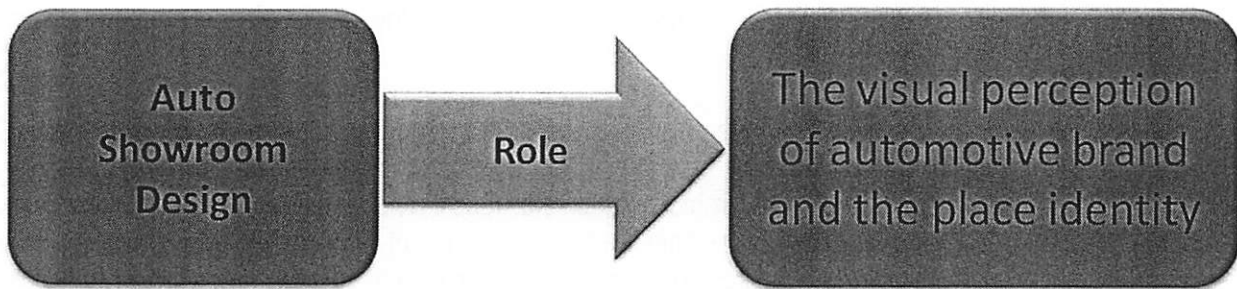


Figure 1
The Main Objective

OVERVIEW

Based on previous studies the researchers shed light on the following three concepts: The auto-showroom design, the automotive brand and the visitor perception, as key themes to achieve the study objective.

1.1. Auto-showroom Design

The field of exhibition design is still in infancy stage and suffering from a scarcity of researches (Bitgood, 2002); therefore the motive behind performing this study is contributing to fill a gap in knowledge. According to Patterson and Bitgood (1988) there are a few factors which play a significant role in exhibiting success, such as: size, motion, aesthetic factors, novelty or rarity, sensory factors, interactive factors, and triangulation. Patterson and Bitgood strongly suggest that the large size of exhibits provides a significant effect on holding visitor attention and viewing time. The moving exhibits are more attractive than the stable exhibits; Melton (1972) had observed that running machine eg. gear shaper leads to increasing the number of the attracted spectators in Science and Industry Museum. The aesthetic value of exhibits is a significant factor to hold a visitor's attention. Melton (1972) and Martin and O'reilly (1982) have suggested that the elements such as the colour, shape, and pattern of the exhibited objects, are elements to determine the time length of visitor viewing. Some of the exhibitions are attractive naturally regarding to the novelty or rarity of the exhibit element eg. large jewels, meteorites, and white tigers. The visual perception is the first sense used by humans, and the vision is the most important sense in exhibition usage. A lot of studies were done from the viewing time measure of the visitor attraction value. Koran, Koran and Longino (1986) noted that the exhibit with notable and touchable get a longer viewing time. The interactive exhibition is the exhibits which have an interaction between the visitor as a user and the exhibits device. The visitor takes longer time in this kind of exhibitions than the non-interactive exhibits. Whyte (1980) described the triangulation as a concept refers to the promotion of a person or an object for interaction among the spectators. The exhibits that promote that interaction will be a more attractive.

Bitgood (2010) suggested, that the exhibition design should consider, how the visitors gradients their attention sequentially into exhibits. He claimed that the exhibition designers have a number of tools to be applied to help in capturing and focusing attention. Lighting effects make the objects more noticeable, as well as the objects isolation. The focusing devices also have an important impact on drawing visitor attention such as the plastic tube usage as a focusing device in "Desert Botanical Garden in Phoenix". The focusing techniques can be tested to ensure the elements of attention are becoming efficiently noticeable. In this study the Auto-show concepts and some themes have been sequenced and organized rationally. Some of these themes required a deep explanation and

comprehensive description of literatures. This section discusses the atmospherics concept as an umbrella of the design elements.

Catherine (2010) used in her study the term of "Atmospherics" to denote the process of manipulating the elements of the internal environment of a showroom such as colour, lighting, sound, design and odor, that affect customer behaviour (Eroglu & Machleit, 1993). The Atmospherics is the ability to change the buying habits of the customer within the five senses (sight - hearing - smell - touch - taste) which are the main driver of human desires. Through the manipulation of the physical environment units within the showrooms can generate positive feeling leads to attract customers and improve sales. Catherine claimed that the showroom atmospherics require controlling the indoor environment in order to generate maximum effects of visitor emotion in order to make the interior space of showroom more enjoyable.

1.2. Automotive Brand and identity

The brand has become a new decision maker, in today's world (Kunde, 2002). This simple statement interprets clearly the emotional effect of the brand value on the customer satisfaction; so that the branding image is defined as a social system based on economic, aesthetic, political, and social distinctions (Giesler, 2003). According to Morel, Preisler and Nyström (2002) the postmodern world branding became more than just produces advertising; The traditional concept of branding is a tool of marketing communication, such as a visual and verbal gun held by marketers and consultants. The key challenge is how to maintain the trust of consumer on the brand in order to achieve the loyalty stage. Morel, Preisler and Nyström (2002) developed a Brand Activation Model based on the interaction through the products and services, employees, identity, till communication as Figure 2 shown. They claimed that this model will gain the customer trust and loyalty, within a fruitful relationship between brands and the community.

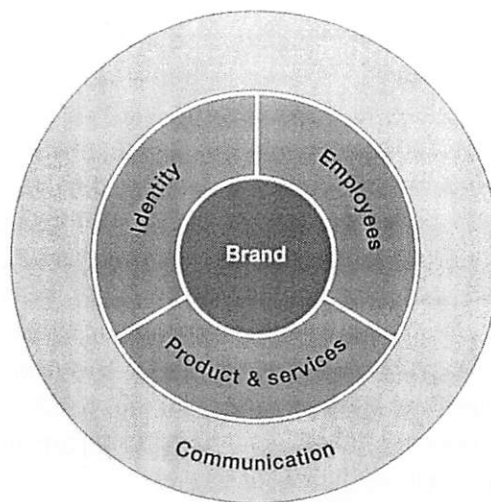


Figure 2

The Brand Activation Model (Morel, Preisler & Nyström, 2002)

Nistorescu and Barbu (2008) investigated the enhancing image brand by using service company techniques in retail stores, and analysed the aspects of environmental store design that link to the model of customer-based brand equity. The marketing environment design has high impact on the purchasing behaviour by; showing the quality and nature of service that presented via transmitting the

message to the public, showing the difference of services among competing companies, and as a driver pushing towards objectives by using colours, sound, materials and other effects.

1.2.1. Automotive Architects

Smith (2006) claimed that the manipulation of lighting effects plays a vital role in perceiving the architectural design (interior and exterior alike), in other words, the new lighting techniques alter the visual perception of space and form.

Frank Gehry and Daniel Libeskind, presented an example, by laying new approach to understanding the role of light in defining the exterior architectural surfaces, as well as considering the dramatic light movements, and the vision changes through the sun-movement. BMW developed this approach conceptually within automotive design "flame surfacing", through the combining of convex and concave surfaces, and waves under the lighting effect. The surfaces have been broken to give an acceptable form of vehicle.

Bitgood (2010) claimed that the building architecture, sounds, temperature, sights, have a significant impact on a visitor's attention within all stages of visitor observation. The features of architect such as multi-doors exhibition space may play a negative role in circulating through the exhibition as well as the temperature (cold), lighting (dim) helps to visitor encourage visitors quickly pass through the exhibitions.

Herbst and Maisch (2009) outlined many facts depending on the relationship between the branding image, and architecture in the field of automotive by presenting some of the automotive companies' efforts. These efforts devoted to giving their brand futuristic touch via architect and design techniques, based on unique company identity; and to avoid the fading of brand image under the high effect of architectural perspective of the automotive buildings. They highlighted this matter by focusing on two concepts (Architect's Brand VS Company Brand). The integration between the two concepts overlap in term of branding image which led to loses the company identity, and how to attract visitors to the company brand and exhibits.

In addition to the significant relationship between the mental image and consumer behaviour by the vividness and the likeability, Herbst and Maisch (2009) claimed that the architectural design had a significant impact on the mental image of automotive companies "emotions are an engine for learning". They focused on the German automotive industry where sheds light on the relationship between the design and brand loyalty.

Audi: is one of the brands that stands in the forefront, for the reason of function characteristics adoption, the aesthetic value, functional efficiency and technical innovations. The three-dimensional form embodied in Audi brand form, where it was characterized by avant-garde, rational and progressive, which combines the aesthetic and functional values. Audi has succeeded in translating these properties and shorthand this issue within the brand architecture. The showrooms were set up before 2007 as a technical feature by using the glass and steel structures for buildings and showrooms, as well as the characteristics of the Audi logo with (Audi) characters see Figure 3

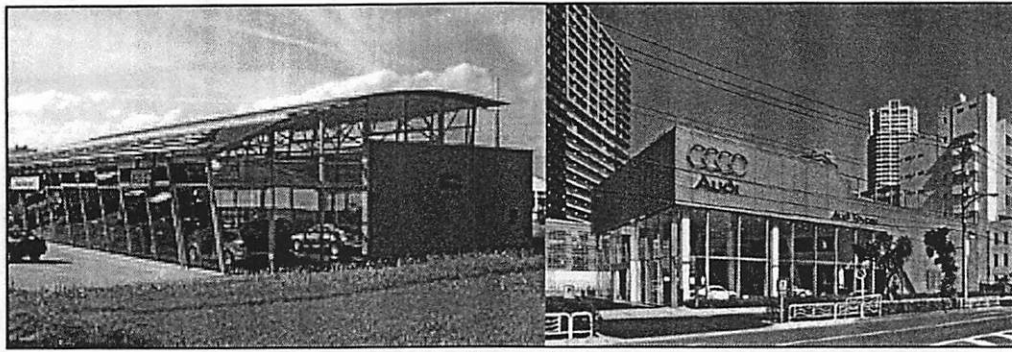


Figure 3

Architecture of the Audi centres (Herbst & Maisch, 2009)

Audi introduced the term terminals as a substitute for the car dealerships by mandating *Allmann Sattler Wappner* the architect firm to give a glimpse modern excellence for the Audi automaker (Herbst & Maisch, 2009). In 2008 the first terminal was open in Munich and was planned to reach 350 terminals end of 2012. These terminals are not just spaces for display, but architectural edifices which adopted the three-dimensional approach to achieve the aesthetic and functional requirements for customer service and selling products to give customers more fun in Audi worldwide.

Herbst and Maisch raises a statement architecture as a presentation platform, and classified to the temporary and permanent, places for brand staging, by hand and try to give this classification an emotional dimension to the visitors (target group) especially with the permanent case. The architecture provides a temporary platform for brand staging through the relationship between the space and mass design; however the brand discloses by attracting the emotions. They claimed the terminal design, should be fulfilling of three requirements: In order to attract the media coverage the design of staging should be an impressive and unusual, the design should be clear enough to ensure the idea is connected in a creative way, and express the brand to be stuck in the target group minds.

Over the past few decades BMW has succeeded within an early stage in term of constructing the formative feature of urban architecture, made for itself a monument in Munich, the company's headquarter, museum and BMW Welt. Herbst and Maisch prefaced analysing the construction, from BMW tower known as a four-cylinders form, which coincided constructing during the Olympic Games 1972, by Karl Schwanzer, the Austrian architect. The four-wheel design of the tower cylinders was inspired as an expression symbolizes the motor cylinders. Close to the company's headquarters the BMW museum had been built by Schwanzer. The museum provided futuristic feature through the huge logo of BMW on the top of the museum roof Figure 4. In 2007 BMW-Welt was as a complementary building, built by a team of architects "Coop Himmelb(l)au". The main feature of this establishment was appointed to be a platform for the BMW group, where it delivers around 45,000 cars annually, to new owners.



Figure 4
BMW World, Museum and Headquarter by Karl Schwanzer
(Herbst & Maisch, 2009)

The high-level of experience and performance-faithfully through the link between the elements of architecture and the customer satisfaction, led to achieve an emotional contact between the client and BMW's brand. In addition to the architectural value of BMW Welt; there are three functions performed: BMW product promotions, display the skills and technological expertise, and provide space for all types of internal and external activities.

The BMW-Welt project aimed to translate the brand message "Freude am Fahren", in English "Pleasure to Drive", or "The Ultimate Driving Machine" to the BMW experience as an identity of this giant company. The three buildings of BMW are the most attractive edifice of the Germans visitors, and tourists alike, and imparted a distinction to Munich city. Since opening on 17 October 2007 more than 3 million visitors, this made BMW is the most popular place in Munich. In contrast of Mercedes-Welt, which was opened in Berlin 2000 didn't get that success in spite of its location in the centre of Berlin, but didn't rise to the level of ambition in term of the attracting the attention by the emotional value of Mercedes-Benz brand.

Franken Architekten presented a unique pattern of visual expression or a visual storytelling, in the trade display of BMW Group design, IAA (Internationale Automobil-Ausstellung) in English "International Automobile Exhibition" in 2009. The objective of IAA project is an architectural expression of the essence of BMW car, that highlighting by environment how BMW is friendly car, excellence in driving and energy-saving. Franken Architekten succeeded in interpreting the value of BMW brand, by architecture design of the exhibition as a bubbles form Figure 5.

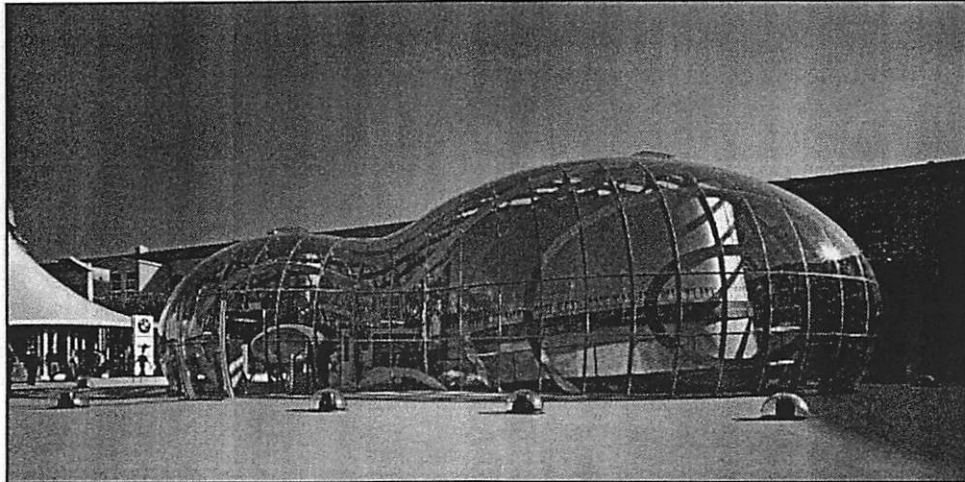


Figure 5
"Bubbles" presentation by BMW at IAA in 1999 (Herbst & Maisch, 2009)

The iconic form of the showroom reflects the impression of safety driving with clean energy. The transparent cortex by glass and steel structures provides the futuristic design and it reflects an emphasis on visual approach as well as highlighting the innovations and technological ability of BMW firm. The concept of permanent places for brand staging, which represented by the Automobile Museums, such as Mercedes-Benz Museums that constructed in 2006, and Porsche Museum that opened in 2009, and Volkswagen Autostadt were examples for permanent display pattern. Volkswagen Autostadt: is a giant project, entrusted to Ferdinand Piëch. It contained some of brands such as Skoda, Seat, Audi, Bentleys, Bugattis and Lamborghinis. The Autostadt project aimed to enable the customer to perceive the concept of Volkswagen brand and learn about the rich history of Volkswagen products. Gunter Henn Architecture, proceeded to create a space of more than 25 hectares included an integrated urban system where the wings and waterways, bridges, lakes, cliffs, hills, green meadows see Figure 6.

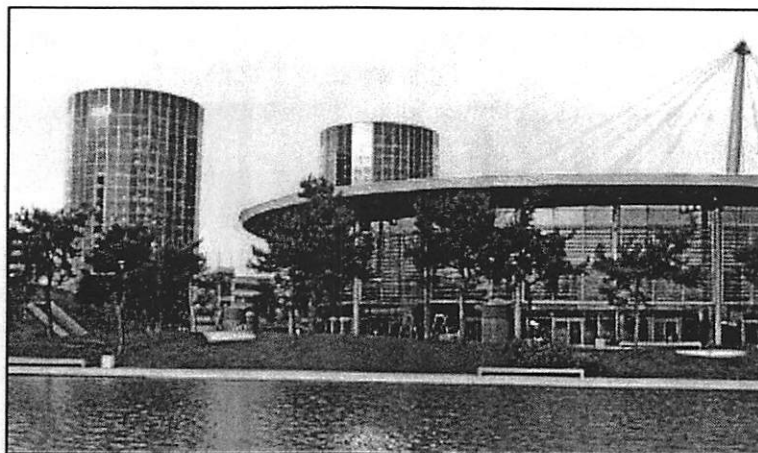


Figure 6
Volkswagen Autostadt by Gunter Henn (Herbst & Maisch, 2009)

One of the most important features of Autostadt is the 48 meter height tower that can be seen from far distance. The Autostadt presents all the vehicle aspects for each brand under the Volkswagen umbrella, within specific pavilions.

1.3. Visitor Perception

According to Bitgood (2002) there is still argument about the visitor studies has become a field of knowledge for those who study the environmental design within the visitor perspective especially in museums. In this section there are some concepts related to the visitor's perception will be discussed.

1.3.1. Psychological Performance

Bitgood (2002) emphasizes, the environmental factors such as lobby, exhibitions, amenities, and macro-architecture in addition to the three variables plays a significant role in psychological performance such as the demographics and leisure values; social influence; and pre-knowledge and attitudes.

1.3.2. Visitor Behaviour

Rounds (2004) claimed that the curiosity is the basic motivation for the visitor behaviour. He added that the curiosity is a different kind of motivations, where the curiosity poses abnormally analyses for the rational choice, based on the assumption that the value of information should be the basic factor effects on the visitor behaviour.

1.3.3. The Role of Exhibition Design in visitor Attention

According to Bitgood (2010) the museum architect has a significant impact on the psychological performance. Melton (1935) referred that the exhibition architecture is: what is usually called "exhibit design". Bitgood (2002) has suggested three of attention principles help in understanding the reactions of the visitor to the exhibits:

- 1- "Attention to exhibits is selective"
- 2- "Visitors must be motivated in order to focus their attention on exhibits"
- 3- "The resources for attending to exhibitions have a limited capacity and are depleted by mental and physical effort" (Bitgood, 2002, p.8).

1.3.4. The Perception

The perception of the world and understanding information is based on the physical stimuli. The process of vision come through containment components in the retina that contribute to the re-assembled according to previous experiences and information to be synchronized with world perception (Boyce, 2003) (Boyce, 2003). Figure 7, demonstrates that with the lighting effects, past experiences have the power to perceive the form.

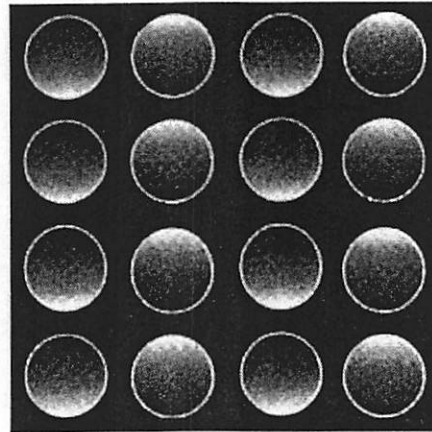


Figure 7
The light direction on surface (Smith, 2006)

Figure 7 presents the convex and concave elements on the surface, are perceived due to our experience on the light direction. The visual sense is the major form of understanding of the surrounding environment (Lam, 1977). Without light the form is not perceptible, as well as, without form the light is not perceptible (Millet & Barrett, 1996). The light is one of the fundamental design tools. In fact, the reflection by car surfaces into our eyes resulted from the light resource; otherwise we can't perceive the vehicle shape without light. Christian Norberg Schulz, the famous architect critic claimed "The additive spatial structures of the renaissance demand a uniform illumination, while Baroque structures based on dominance and contrast a more 'dramatic' illumination." (Norberg-Schulz, 1968), therefore it can draw similarities between (Bauhaus) the most contemporary and the Constructivism (DeCon) schools of architecture. Bauhaus, and Postmodern doctrines states that the form should reflect the social importance initially, by the rational approach "the form follows function" in design. Mies van der Rohe presented a clear example in Farnsworth House, as well as the Audi TT in Figure 8, the elements of these form structures reflect the environmental lighting dramatically, by the form surfaces.

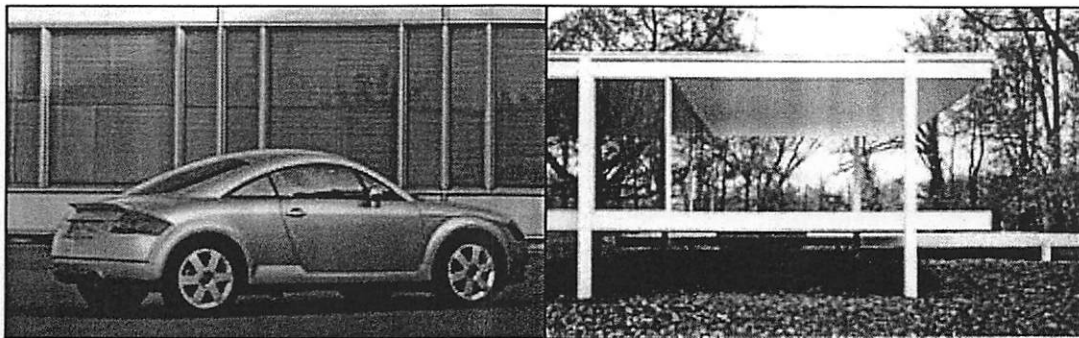


Figure 8
Audi TT, and Farnsworth House (Smith, 2006)

Smith (2006) claimed that both the automotive and architecture are concerned in an aesthetic sense, perceivable via reflection light across exterior surfaces. He added that the visual perception of the Farnsworth house form, based on the light response on the exterior structure. As well as the interior form is perceivable by the presence and flow of light. The DeCon school avoided "the form follow function" ideology, despite the modernist school of thought. Projects like Disney Centre in Los Angeles and Bilbao Guggenheim by Frank Gehry emphasizes the great effect of this approach, as in Figure 9.

From sunrise to sunset the lighting effects design plays a vital role in visual perception and demonstrate dramatic changes in perceived form (Smith, 2006). Chris Bangle in (Smith, 2006, p.21) claimed that some of the cars stand out “they stand out because they marked a turning point in car design away from pure rationalism into rationalism-based emotionalism.”

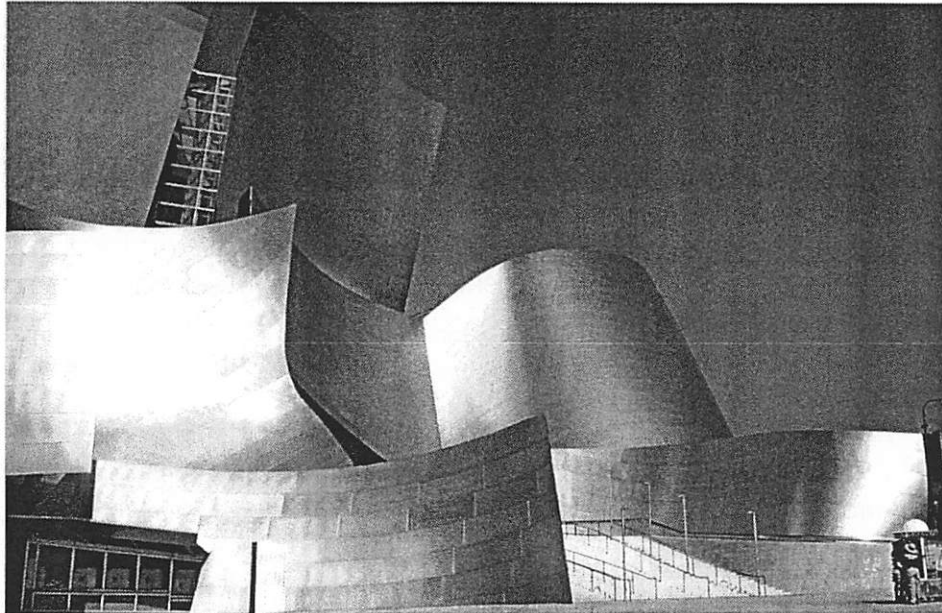


Figure 9
Disney Centre in Los Angeles by Frank Gehry Figure (Smith, 2006)

1.3.5. The Rule of Design Element in Visual Perception

According to Berdan (2006) there are five elements of visual design: line, shape, form, colour (light or dark), and texture. Others claimed that the design elements are seven, including those five plus the space and value (Gatto, Porter, & Selleck, 2000). Polakowski (1989) claimed the physical design elements, which employs in the visual arts are line, form, colour, texture, space, value, direction, and size.

However, there is an argument about the elements of interior design. Countryman & Jang (2006) claimed that the atmospheric elements such as lighting, colour, layout, furnishings, and style can affect the physical environment. He suggested that three of these elements are affected significantly on the visual perception within the physical environment. The three elements are colour, lighting, and style.

Others have detailed definition of the interior design elements by dividing this concept according to the interior design multiple compounds aspects: walls, ceiling and floor aspect; in addition to the cover materials; the store lighting effects, the background, sound, affective factors, temperature, and space arrangement. These interior design aspects are important to create a positive image for the company brand. Some of those elements affect on the human behaviour and emotions (Nistorescu & Barbu, 2008).

1.3.6. Photo Album Test

The researchers developed *Photo Album Test* as numeric scale to measure the impact of colour as a design elements on the auto-showroom visitors (Al-Helly & Fuziah, 2012). By using ANOVA

test the findings showed, the colour has a significant impact on the visitor within the interior space of auto-showrooms. The photo album test and this paper are parts of an in-depth study entitled "The Impact of Colour as a design element on Visitor Attention in Proton Showroom, Malaysia".

CONCLUSION

This study reviewed some of automotive brands as examples, such as Audi, BMW and Volkswagen, which focuses on the architecture and design in order to attract the visitor's attention, maintain the client's trust and loyalty, and to avoid the fading of brand image. Designers and architects emphasize that the automotive construction reflects the power of the auto-firm, and play a vital role in strengthening the identity of the automotive brand. The design elements play a significant role in visual perception of automotive brand and place identity. The literature reviewed in this study is in line with the study aims in investigating the relationships between the showroom design and the visual perception of automotive brand and place identity.

REFERENCES

- Al-Helly, F., & Fuziah. (2012). Using the Photo Album Test, To Scale a Visitor Attention in Car Showroom. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, 4(1).
- Berdan, R. (2006). Composition & the Elements of Visual Design. www.scienceandart.org.
- Bitgood, S. (2002). Environmental Psychology in Museums, Zoos, and Other Exhibition Centers. *Handbook of Environmental Psychology*, John Wiley & Sons, 461-480.
- Bitgood, S. (2010). An Attention-Value Model of Museum Visitors. *Center for Advancement of Informal Science Education (CAISE)*, 29.
- Boyce, P. R. (2003). *Human Factors in Lighting, Second Edition*: Taylor & Francis, CRC Press.
- Countryman, C. C., & Jang, S. (2006). The effects of atmospheric elements on customer impression: the case of hotel lobbies. *International Journal of Contemporary Hospitality Management*, 18 (7), 534 - 545. doi: 10.1108/09596110610702968
- Eroglu, S. A., & Machleit, K. A. (1993). Atmospheric Factors in the Retail Environment: Sights, Sounds and Smells. *Association for Consumer Research*, 20, 34.
- Gatto, J. A., Porter, A. W., & Selleck, J. (2000). *Exploring Visual Design: The Elements and Principles*: Davis Publications, Incorporated, 2000.
- Giesler, M. (2003). Social Systems in Marketing. *E - European Advances in Consumer Research*, *Association for Consumer Research*, 6, 249-256.
- Hanson, G. H., Raymond J. Mataloni, J., & Slaughter, M. J. (2004). Vertical Production Networks in Multinational Firms. *Center on Emerging and Pacific Economies*.
- Herbst, D., & Maisch, B. (2009). The Potential of Corporate Architecture in Corporate Communication.
- Koran, J. J., Koran, M. L., & Longino, S. J. (1986). The Relationship of Age, Sex, Attention, and Holding Power with Two Types of Science Exhibits. *The Museum Journal*, 29(3), 227-235.
- Kunde, J. (2002). *Corporate Religion: Building a Strong Company Through Personality and Corporate Soul*: FT Prentice Hall.
- Lam, W. M. C. (1977). *Perception and lighting as formgivers for architecture*: McGraw-Hill Inc.,US.
- Martin, J., & O'reilly, J. (1982). *Designing zoos for children : an alternative approach*. Paper presented at the Proceedings of the International Conference on Environmental Design Research Association.

- Melton, A. W. (1935). *Problems of installation in museums of art. Studies in museum education* (Vol. 14).
- Melton, A. W. (1972). Visitor Behavior in Museums: Some Early Research in Environmental Design. *The Journal of the Human Factors and Ergonomics Society*, 14(5), 393-403. doi: 10.1177/001872087201400503
- Millet, M. S., & Barrett, C. J. (1996). *Light revealing architecture*: Van Nostrand Reinhold.
- Morel, P., Preisler, P., & Nyström, A. (2002). Brand Activation. *Starsky Insight, Stockholm, Sweden*.
- Nistorescu, T., & Barbu, C. M. (2008). 'Retail Store Design and Environment as Branding Support in the Services Marketing. *University of Craiova*, 6(1), 11-17.
- Norberg-Schulz, C. (1968). *Intentions in Architecture*.
- Patterson, D., & Bitgood, S. (1988). Some Evolving Principles of Visitor Behavior. *Annual Meeting of the Southeastern Psychological Association*
- Polakowski, K. J. (1989). A Design Approach to The Zoo as Theater. *Zoo Biology Supplement*, 127-139
- Rounds, J. (2004). Strategies for the Curiosity-Driven Museum Visitor. *citeulike*, 47(4), 389-412.
- Saade, C. (2010). *Assessing the Use of Atmospherics in Automobile Showrooms in Accra - Ghana*. University College of Science and Technology.
- Smith, A. P. A. (2006). *Dynamic Variation of the Perception of Automotive Form*. Retrieved from <http://downsideupdesign.com/wp-content/uploads/2011/01/Drew-Smith-Thesis.pdf>
- Sturgeon, T. J., & Biesebroeck, J. V. (2010). Effects of the Crisis on the Automotive Industry in Developing Countries. *The World Bank, WPS5330*.
- Whyte, W. H. (1980). *The Social Life of Small Urban Spaces*: Ingram

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VALUE ENGINEERING METHODOLOGY TO IMPROVE THE QUALITY OF BUILDINGS FOR A LIVABLE CITY

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ABSTRACT

The application of value engineering approach allows the possibility of qualitative upgrading projects and services by raising the value of improvement and development while reducing overall costs without increase in the expenses of the necessary requirements and needs. The research problem is the growing demand for the best use of resources because most if not all are subject to depletion and for this reason the application of the approach value engineering projects and services is urgent under global competition severe with the knowledge that the application value engineering has achieved results in cost reduction and conservation and development on various environmental resources for a sustainable environment. The aim of this paper is to highlight the concept studies of value engineering, and the statement of its role in the reduction of expenses. This study does not serve the goals and purpose; it can be used to achieve the required quality in products and projects with the lowest total cost possible, to achieve global competitiveness in the architectural projects of all sizes and for achieving the best return on investment to spend money in all government institutions and non-governmental organizations. The paper will also launch and review the work plan of value engineering that relies on teamwork, creativity and on the role of the architect in order to reach innovative solutions to conserve environmental resources and the built of sustainable environment.

Key Words: value engineering, livable city, quality of buildings.

INTRODUCTION

The qualitative upgrading of projects and services by raising the value of improvement and development, while reducing overall costs that have no benefits to the project only if we application of value engineering approach. The optimal utilization of resources is the demand due to the increasing need to them day after day because most if not all have met for depletion and increasing demand steadily. For this reason, the application of the approach of value engineering projects and services becomes an urgent demand for the survival and development .The application of value engineering has achieved tangible results in reducing costs from 5% to 15%.The aim of this paper is to highlight the concept of value engineering studies and the statement of its role in the reduction of expenses that do

not serve the goal and purpose. It can be used to achieve the required quality in products and projects at the lowest total cost; in order to achieve global competition in the architectural projects of all sizes. The aim is also to have the best return of the investment to save money in all government institutions and non-governmental organizations. The review on the general plan of value engineering work relies on teamwork, creativity, and the role of the architect. Value Engineering is of the most important and the latest programs that are currently applied in many technologically advanced countries, applied in Saudi Arabia for more than ten years. Value engineering is defined as "a collective effort organized for the analysis of functions and compliance with project objectives and requirements of the owner and the beneficiary. It devises alternatives to the performance of these functions and achieves goals at the lowest possible cost without compromising quality and basic functions. They are the modern technology and science systematically proved its position known because they help to reduce the cost and improve quality at the same time. The method of value engineering is the scientific methods which became thoughtful to users effectively and applied by various companies and institutions. Their success is due to the methods of teamwork and the ability to select the desired functionality. This in turn helps us to get rid of excess costs with quality control, quality and other important factors that meet or exceed the expectations of the owner and the beneficiary.

WHAT IS VALUE ENGINEERING

The value engineering is considered one of the newly engineered methods, a deliberate and scientific approach which aims to achieve the functionality and raising the quality while lowering the total cost of the projects, in industrial engineering and management systems. Growing global interest in value engineering through specialized professional associations even have been held several seminars and international conferences on patrol in this area Most countries have found the feasibility and effectiveness of the application of this technique in various fields.

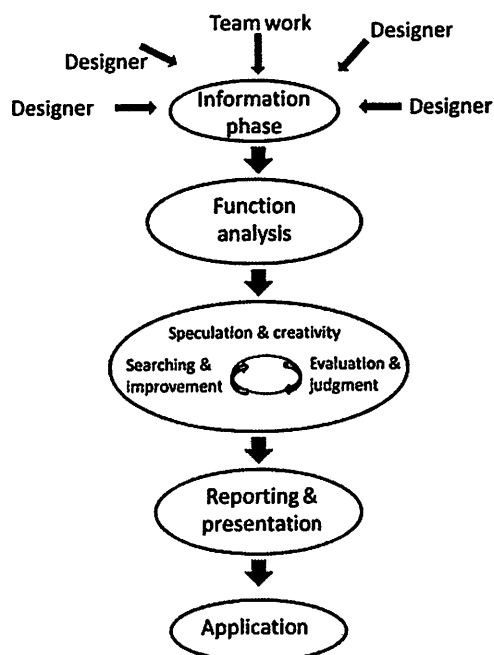


Figure (1) Diagram showing stages of job plan in value engineering (Khowaiter, 2000)

The method is the application of value engineering according to the action plan consists of sequential steps and stages in accordance with the value engineering approach adopted by the International Organization is shown in Figure (1) and can be stated as follows :Pre- study of values: until the team starts to collect the necessary information for the study and to ensure the completeness of documents of the project and the preparation of models used for the cost, space and energy, and so on. Phase of the study are divided into value: Six basic stages are as follows: (Dell Isola , 1997)

1. Information Phase.
2. Function Analysis.
3. Creativity and Speculation.
4. Evaluation and selection phase Evaluation and Judgment.
5. Development stage and Reporting and Development Report.
6. Supply and application phase Presentation and Implementation.

The final Stage is after value study until the presentation and discussion of the application of the proposals and alternatives, which ends the study with the recognition of the expected benefits. The following is a follow-up application of the results of the study and discuss of any obstacles or amendments thereto, and see the impact of the value study on the project. From this Illustration the stages of value engineering plan of action are shown. Value engineering is characterized from other techniques and other methods by some advantages which can be summarized as follows:

1. Methodology and organization in the stages of the action plan.
2. Focus on the job and to achieve cost value.
3. Collective action by a multidisciplinary team.
4. Freedom in the IPO and creativity.
5. Organized assessment to ideas.
6. Full attention to the development and presentation of proposals.

Also characterized by value engineering studies in the field of work and clear facilitate the work of the team and helps to focus on achieving the objectives of Value Engineering High fixed and promoted them to the public interest which the objectives is to make the most of the costs and therefore the optimal utilization of resources and capabilities.

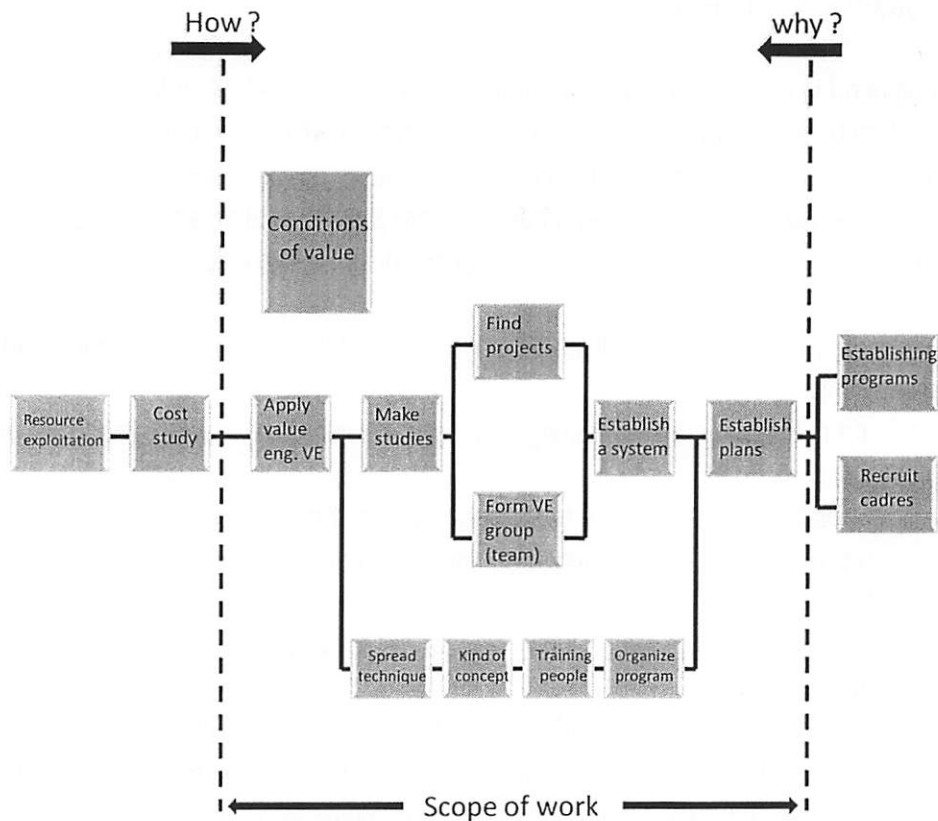


Figure (2) Diagram for function analysis and study the function of Value Engineering (Khowaiter, 2000)

Value Engineering definitions:

The pioneers of the field of value engineering and interested parties had tried to develop specific definitions of this concept .The following are some of these definitions:

- (a) Definition (Dell Isola): Value Engineering is a systematic and creative approach, which aims to reconcile the cost and performance of a system. Also could be considered for this area as a way or approach to design and decision-making, which aims to delete unnecessary jobs without compromising quality or aesthetic values. (Dell Isola , 1982).
- (b) Definition of (Zimmerman & Hart): Value Engineering is a good performance technique using a systematic approach to the balance between higher efficiency and cost between functional and overall performance of the product. (Al Senoussi , 2000).
- (c) Definition of SAVE): Value Engineering is the systematic application of the functional definition of technology product or service, and determines the value of each job, and achieve the necessary functions at the lowest possible cost. (Alcyprusly , 2000) .

Through tariffs prior to the Value Engineering we can say that the primary objective of value engineering is to achieve the highest value of the project through the improvement of the overall costs and / or job performance while maintaining the auditing and investigation of the level of quality required, through a systematic approach aimed at detecting unnecessary costs and then to be removed.

BENEFITS OF VALUE ENGINEERING

Study of value engineering can produce recommendations to remove 10-30% of the costs of a project which is accomplished by removing unnecessary costs of a project which is accomplished by removing unnecessary costs, and on the other side, the costs of the efforts of value engineering is usually less than 10% of the savings learned (Mateix, 1997), as there are a number of potential benefits which can be produced from the use of the value engineering services, including the following (Dell Isola, 1982).

- 1 - Saving time: Early Value applications will save design time and through clarifying vision and reduce failed attempts, which calls for redesign.
- 2 - Standardization and details: Value Engineering helps ensure access to standardization alternatives to reduce costs.
- 3 - Overcome design problems: The review team performance through the value of the indigenous people who are not designers in order to identify potential design problems in a timely manner so as to be corrected during the design phase.
- 4 - To help solve the problems: Helping in the development of proposals for improvements to the problems of performance and cost.
- 5 - Improve the management of programs and special studies: It can be Through tariffs prior to the Value Engineering we can say that the primary objective of value engineering is to achieve the highest value for the project through the improvement of the overall costs and / or job performance, while maintaining the level of quality required, through a systematic approach aimed at detecting and identifying unnecessary costs and work to be remove.

THE DIFFERENCE BETWEEN VALUE ENGINEERING AND COST REDUCTION

The cost reduction is based on the segmentation of the project and the abolition of some of these parts, while value engineering is based on the analysis of the functions of the project, which is designed to keep all the elements of the project while reducing costs (Alyousfy, 2004), and the fundamental difference between the value engineering and cost reduction summed up in a way that focuses both on the job's efforts to reduce the traditional costs and give little considerations to the function for the needs of the user while the Value Engineering focuses on achieving these functions required under cost-appropriate (Dell' Isola, 1982), and the system cost reduction aims to reduce the current cost while value engineering aims at achieving savings in total costs which include the initial costs and the cost to use which results in a future during the operation of the project (Flower, 1900) and the following Table(1) shows the difference between the financial value at lower costs and at the Value Engineering.

Table (1) the difference between cost reduction and value engineering (Dell' Isola, 1982)

$$\text{Value measurement value index} = \frac{\text{Cost of Merit}}{\text{Total cost}}$$

Under discussion is how we could make less expensive elements of the project? And what is the function of this element?

How can its job is better or less expensive?

Value engineering	Cost reduction	
Value = $\frac{\text{merit}}{\text{cost}}$	Value = cost	Value measurement
What is the function of the element ? How can the element do its job well by the least cost possible?	How we can do the element at its lowest cost	Problems to be discussed

Through Table (1), we find that the concept of cost reduction value becomes the equivalent of the total cost calculations, and the key question is how to reduce the cost, but the concept of value engineering value is equivalent to the lower cost of the job and the key question is what is the desired function and how it can be performed better and cost less.

THE DIFFERENCE BETWEEN VALUE ENGINEERING AND VALUE ANALYSIS

Value analysis is applied to the study projects that has ended, or products that are currently used to take another look to improve their performance and get rid of excess costs in the future (Alyousfy, 2004), representing a value analysis of analytical approaches to test the relationship between job performance and cost of the vacuum (Fram, 1989).

Value analysis is based on the methodology of an organization working to delete unnecessary cost elements in order to increase the quality of the product for the project has already been built or designed, been studied to see whether it can improve or reduce the cost (Al Senoussi, 2000).

VALUE TYPES

The primary purpose of value studies is to improve the value at its lowest possible cost. And utility value (benefit): All you need is useful, but not things beneficial is not necessarily be of a value in the economic sense. The benefit is a phenomenon linked to the need, while the value is linked to scarcity, and if the need is to create a benefit that makes the item value, of which depends and abundance item, or its scarcity, i.e., that the value here is linked to the economic sense. Relationship between

value and work: The value is equivalent to the expenses of the production, provided that the profit will include production expenses the natural value depends on what make the effort, or work during production and must look at the quality of work and efficiency. (Alyousfy, 2004) .If you decide to build value on the benefit, or based on production expenses to resolve this confusion some definitions of value are done as follows:

- 1 - The value of cost (Cost value): a total cash cost to produce something (direct costs plus, indirect, and maintenance, in operation, etc.).
 - 2 - Aesthetic value (Aesthetic): are the aesthetic qualities and features desired by the beneficiary.
 - 3 - The value of use (Use value): The mean overall benefit of the product in use.
 - 4 - The value of the replacement (Exchange value): means the purchasing power of the commodity.
- Value engineering is concerned with all of the economic value and functionality that are linked to a large extent to the value of use, quality and pathological features that check its use. (Dell' Isola, 1982)

HOW TO MEASURE THE VALUE

Value is characterized by some specific features (Mohammed, 1994):

- The value of material which vary according to their content, that is they are not absolute in the item,
- the extent of the material, which meets the value by comparing them with other materials.
- Value is the relationship between what the individual's needs are and what he gets from it.

From here emerged with multiple formulations scientific references to measure value are as follows:
First: the cost and maturity

Cost is what pays for the item while accrual accounting for less cost to perform the function (what are the ideas that we have, which will result in at least function). (Dell' Isola, 1982). Bearing in mind that if you did not result in any element of the construction job required, whatever the cost reduction will not lead to this benefit and therefore any functional capacity is less than required will be unacceptable, and any increase in these elements will be a waste of resources. (Faraj, 2005).

Maturity is defined in the lexicon Kohnh value of something and compares the extent of the quality, or the extent of it's in the impact on our emotions and sensory aware. (Mohammed, 1994)

And can be drafted by following relationship to translate into numbers that can be measured by converting it to the equivalent function and measure the user receiver for this job as a way directly measurable.

$$\text{Value} = \frac{\text{coefficient of Merit}}{\text{Cost}}$$

From here, the following equations were suggested:

$$\text{Coefficient of value} = \frac{\text{Impressions guide} + \text{satisfaction in use (functionally)}}{\text{cost}}$$

The above equation is actually a complex equation which depends on the extent to accept user and satisfaction rather than psychological conditions which tend to interact positively with the building, and has undergone many studies, the most important in the world. in the fifties of the previous century who developed a system called (Snodgrass system), a system based on the study of Merit real one in the

blanks and measuring reactions natural for a class intended users about this space and repeated the experiment with changes in the space and measurement, that show the extent of compliance with the requirements for that class of space, the so-called acceptance Career (Mohammed, 1994). Second: the elements of value:

The value is based on three main elements which are the functionality, quality and total cost: (Alyousfy, 2004)

1. Functionality: is the primary purpose for which it was found in the item, or product.
2. Quality: means the requirements and desires and expectations of the beneficiary.
3. The total cost: representing the total initial fixed cost and cost in use.

If Measuring value lies in finding relationship between these items, the raise of the efficiency and improvement quality with reducing cost, which enables us to obtain the highest value hence the following equation formulated the coefficient of value = functional performance +quality / total cost :

Figure (3) gives a conceptual meaning to how to get value, and through the creation of the elements that achieve the three elements of the value represented in the form of circles, and the interaction between these circles means to get the highest value.

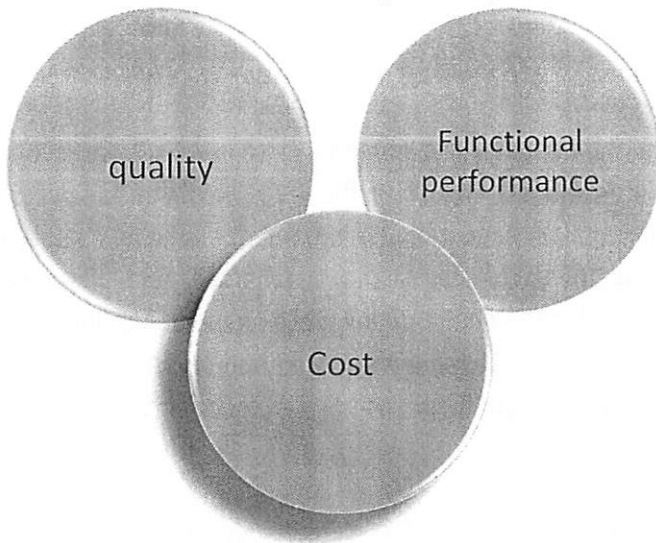


Figure (3) elements of the value (Alyousfy, 2004)

Third: the value in the use:

The modern concept of value engineering focuses on the user which is a key element and effective and which is linked to value through the concept of (the value in use), which represents the customer's requirements and needs of the interaction between the user and the designer for the production of the final form and are viability of the final product for marketing on the extent to which these inputs are represented as follows:

A) User requirements WANTS:

Featuring user requirements by a nature self and is difficult .Set fixed determinants to it, like a self personal, differentiation among factors are satisfaction psychological, The trends in ancient Value

Engineering was to ignore the user requirements through selection, measurement, and it is called (Esteem value) represented by degrees of favorite colors, which vary from one individual to another, as well as the texture of the material, geometric shapes that the individual wants, all of which depend on the specific nature of the individual.

B) The needs of users NEEDS

Is a more comprehensive class which determine the humanitarian for a wide range of users needs (physiological, social, etc), which can be measured and determine, for a wide range of users that made on the user to determine their basic needs, and then translate these needs into a space function. Adopt the process of measuring the value in the concept to transform the humanitarian needs of the elements into measurable quantities each of which record level with a range fixed with the function and location (Lighting - Ventilation - Heat - ...etc) and others with a range of associated category target such as privacy and effect of size of the openings - functional separation - ...), also some factors affecting safety, like value coefficient is expressed by the effect of the safety (walk distances - organize street networks ...) i.e. , converted to the humanitarian needs of the design elements related to measurable categories and then can determine the extent of the ability to achieve the humanitarian needs of those design elements and special target category (Mohammed,2004) .From the previously stated it is possible to formulate the following equation:

Value = needs + requirements /total cost

Also can be expressed by the extent to which the needs or requirements is satisfied (Shillito.L,1992): (The degree of achievement requirement = the relative weight of the need x ability to achieve) This means that the value depends on the humanitarian needs and on the order of these requirements, in the case where the alternative equal to the sum of the value components this method can be used to evaluate the items when digital is measurable, and in the case of many of the ingredients the work is carried by making a table to calculate the total value of the alternative, taking into account that: the ability to achieve the requirement is divided into five categories [Excellent (0.9) - Good (0.7) - Accepted (0.5) - Bad (0.3) - very bad (0.1)].

In view of the foregoing multiple formulations to measure the value of arguably synonymous terms that by using the concept of cost and maturity, value coefficient was calculated by measuring the relationship between maturity (translated to satisfaction in the functional use and to achieve impressions manual) and the total cost.

Using the concept of value elements coefficient, which can be calculated by measuring the value achievement of the functionality, quality and total cost as shown earlier.

Using the concept of value when user coefficient was calculated by measuring the value of achieving the requirements (which later translated to the functional and performance which meets these requirements) and requirements (which is synonymous with the meaning of quality) rather than the total cost.

It is worth mentioning here that the concept of the usual quality is compliance to specifications; this situation remained so for years long before scientific development, which proved the analytical comparison, the quality concept last is considered the ruling when it is desired to achieve a customer satisfaction concept which is the modern quality. (Qatar, 2001) .Thus, we find that each of the three formulations to measure the value coefficient focused on the same elements and met on the same mathematical relationship between these elements.

It is during the previous formulations to measure the value we find that the value can raise the level by one of the following ways:

- 1 - Increasing the utility and functionally without an increase in cost.
- 2 - To get the same career utilization while reducing cost.
- 3 - Combination of increased maturity career while reducing the cost, which represents the optimal maturity.

BUILDING SUSTAINABILITY

A sustainable building may be defined as technology and practice which meet the multiple requirements of the people and society in an optimal way during the cycle of the building facility (Sarja,1998).Factors that affect the design of sustainable building include Economy, Functionality, Durability, Aesthetics, Ecology, Health, and Sosio-cultural aspects figure(4). The designer should consider all these factors in order to design a sustainable building in the livable city.

The problem of designing a sustainable building in developing countries has been identified by different researchers and summarized (Makenya, and Soronis, (1999). First, there exists a lack of innovation in sustainable and durable materials. Another existing problem is the reluctance of local professionals to encourage the use of sustainable building systems that are durable and environmentally friendly. Finally, local building regulations standards and specifications are not sufficient to enable the evaluation of building systems from a sustainability point of view. These studies imply that most of the building sustainability problem may be attributed to the decisions made during the design phase. In addition, research on building failures in traditional buildings showed that incidence of failure was attributed in 50% of cases to design faults. (Bonshor, and Harrison,1982)

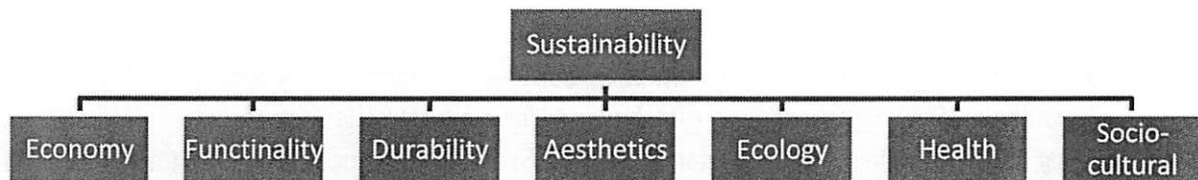


Figure (4) factors affecting Sustainability

IMPROVING BUILDING SUSTAINABILITY FOR A LIVABLE CITY

The application of the Value Engineering approach during the design phase may be adapted and utilized to improve building sustainability. As noted earlier, Value Engineering mainly focuses on the

(Value) delivered to the owner, which is expressed in Cost, Function, and Aesthetic forms. Meanwhile, factors affecting the design of a sustainable building include Durability, Ecology, Health, and Socio-cultural in addition to Economy, Functionality, and Aesthetics. If the Value Engineering team is able to consider the remaining sustainability factors during the application of the Value Engineering (Job plan), the result should be not only the increase in the (Value) delivered to the owner , but also a sustainable building that fulfills the different sustainability requirements.

CONCLUSION

The goal of value engineering is to achieve the highest value of the project to achieve a balance between the higher efficiency and functional performance and keep the cost minimum and keeping higher overall performance of the project by using a systematic approach aimed at the removal or modification of the elements they are not necessary for the functions and , add elements to achieve the desired functions or , by changing elements to improve the quality or performance to achieve a higher degree of the wishes of the customer or user. Beyond the importance of value engineering cost savings, the goal has many additional features for the design process which are:

- (a) Identify potential design problems in a timely manner to be corrected during the design phase.
- (b) Save time by clarifying vision, and reduce failed attempts that require redesign.
- (c) Improve the management of programs, and studies related to design for cost and life cycle analysis, as required to do value engineering efforts in many directions, and thus represent the umbrella of a comprehensive performance evaluation.

There are several formulations in tandem to measure the value and all depend on achieving the highest performance with the functional integration of the expectations and wishes of the beneficiary under less total cost of the project. Improving building sustainability requires unifying efforts of all involved parties. Practical approaches need to be developed .Policy makers should draft laws that imply the use of sustainable systems and materials .Owners should also demand their designers to use more sustainable systems .Architects are required to consider the various factors for designing sustainable buildings and to encourage the implementation of effective approaches for the enhancement of their designs.

REFERENCES

- Alcyprusly.K.K.N.(2000). Design and control in buildings economies - reducing wastage in basic materials), PhD, Faculty of Fine Arts, Helwan University, P 84(in Arabic).
- Al Senoussi, H.(2000). Intelligent Computer System for Exchanging Value engineering Implementation in the Egyptian construction Industry", A.U.C., P. 15.
- Alyousfy.A.Z. .(2004). Value management concept and method," King Fahd National Library, fourth edition,p ,23,24,28,29. (in Arabic).
- Bonshor,R.B.and Harrison,H.W.(1982) .Traditional Housing : A BRE study of Quality- UK.
- Dell Isola ,Alphonse.(1982). Value Engineering in the Construction Industry,Van Nostrand Reinhold Company ,Third Ed..p.2 ,14,61.
- Dell Isola ,Alphonse.(1997). Value Engineering : Practical Applications, R.S Means Company,p.62.

- Faraj,J.F.(2005). Architectural project management," Master Thesis, Faculty of Engineering, Alexandria University, p 47 (in Arabic).
- Flower. T, (1900) Value Analysis in Designs, Van Nostrand Reinhold, U.S.A., p. 22
- Fram. D,(1989)"Value analysis a Way to Better Product and Profit", Ekistic, Vol 155, p.1
- Khowaiter.A.M. (2000).Challenges facing the organization and practice of value engineering, www.adeng.com.sa/articals/articals_08.doc, (in Arabic)
- Makenya ,A.R. and Soronis,G0(1999).Designing for Sustainable Buildings in Developing Countries- Problems and Priorities) 8DBMC – Proceedings of the Eighth International Conference on Durability of Building Materials and Components. Vancouver,Canada30Mai-June3 ,pp.2050-2056.
- Mateix.O.A.R. (1997).Planning and design phases in bridges with long seas application of Value Engineering, PhD, Faculty of Engineering, Cairo University, p 9 (in Arabic)
- Mohammed.A.O.(1994). Value engineering input to increase the effectiveness of the design average housing models," Master thesis, Faculty of Engineering, Cairo University, p 92,101,103-104, 126-127 (in Arabic)
- Qatar.I.M.A (2001). The economic dimension of finishes with sophisticated construction technology - the effectiveness of the design and implementation phases in upgrading processes of design objectives, PhD Thesis, Faculty of Engineering, Cairo University, p 157. (in Arabic).
- Sarja,A.(1998). Integrated life cycle design of materials and structures), CIB World Building Congress, 7-12 June, Gavle, Sweden. Materials and Technologies for Sustainable Construction- Construction and the Environment, pp.827-834.
- Shillito. L. and Demarle, David J. (1992). Value, its Measurement, Design and Management, New York: John Wiley & Sons, Inc. p. 124-127

AN EXPLORATION INTO THE NATURAL VENTILATION IN ATRIA

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ABSTRACT

Natural ventilation is a passive and traditional cost-effective technique to cool and ventilate buildings. Stack ventilation and wind-induced ventilation are the two main methods for inducing natural ventilation. The advanced technology of highly glazed atriums is currently being incorporated in the design of large modern buildings in order to take advantage of day lighting, solar heating and natural ventilation. This paper aims to have an approach to the natural ventilation on central open to sky spaces by examining samples of modern building. This study is expected to encourage building designers to reconsider natural ventilation as an important strategy for green building in terms of energy efficiency demands and environmental concerns.

Key Words: *natural ventilation, green buildings, atrium, energy demand.*

INTRODUCTION

In recent years, facing the risk of global warming and of the diminution of fossil fuels, reduction in energy consumption along with sustainable development is a priority for many countries. Moreover, the population growth has caused more than 200% increase in CO₂ emission from 1995 to 2010 (Mahlia et al., 2010). Building sector is responsible for more than one third of total energy use and it is in most countries the largest greenhouse gas emissions source (Masoso and Grobler, 2010). Their energy consumption pattern will likely increase sharply in the near future (the Department of Energy, 2004). The fact is that energy used in our buildings, including ventilation, heating, and cooling systems accounts for more than 60% of total buildings energy consumption (Chan et al., 2010). As a result, there has been a general movement towards finding effective design strategies to lower the energy demands of buildings and to encourage further awareness of energy-conscious design (Ekkachi and Mahaek, 2003). With the dawn of the 21st century which brought along the issues of global warming and depleting oil crisis into worldwide attention, there is a renewed interest in passive building design which reduces energy consumption and the corresponding carbon footprint. Energy efficiency is becoming more of a priority in recent years as energy consumption has become a serious concern and is becoming a crisis (Muhaisen and Gadi, 2004). One significant technique to reach on energy efficient building is, using renewable energy such as hydroelectricity, solar energy, wind energy, wave power, geothermal energy, artificial photosynthesis, and tidal power. Solar concepts as renewable and green energy are the main source for daylighting, heating and cooling. Among passive and active cooling techniques such as solar chimneys, thermal mass, ventilation, roof ponds, etc. Natural ventilation

increasingly gained the attention of building stakeholders to reduce energy consumption and has opened a new area of study known as low energy architecture (Wu et al., 2011; Karava et al., 2007). Natural ventilation in different levels can provide sufficient fresh air, partly cooling, or sufficient natural cooling. Natural ventilation systems such as wind catchers and chimneys have been used in buildings for many centuries (Santamouris and Assimakopoulos, 1996). The two fundamental principles of this method are stack effect and wind driven ventilation. Khan et al., (2008) made an extensive investigation and reported seven passive ventilation strategies, including: window openings, atria and courtyards, wing walls, chimney cowls/exhaust cowls, wind towers, wind catchers and wind floor e air inlet system. Beside stated strategies, solar chimneys and underground ventilation ducts also were assumed as two other ventilation methods by Nguyen and Reiter (2011). As it is mentioned before a common natural ventilation and thus cooling technique is the use of atria and courtyards. The latter have been used for thousands of years and are common architectural features in many areas including the Middle East and Mediterranean. Both are used as centerpieces in buildings and are in direct contact with the outside environment.

This paper aims to underline and review natural ventilation techniques in the open to sky central space in building and their contribution to the improvement of the indoor environmental quality as well as to the reduction of cooling loads. The paper starts with a short introduction in ventilation covering stack effect, wind induce, and hybrid ventilation and then continues using ventilation methods on atria and courtyards.

LITERATURE REVIEW

The literature review focuses on: Natural ventilation, Wind induced, Stack effect and Hybrid systems

Natural Ventilation

Ventilation is changing of air in an enclosed space (Faye et al., 2005). Air should continuously be withdrawn and replaced by fresh air from a clean, external source to maintain good indoor air quality which may be defined as a state where no known contaminants are present in harmful concentrations (Faye et al., 2005). A lack of ventilation can cause excessive humidity, condensation, overheating and a build-up of odours, smokes and pollutants (Faye et al., 2005). In commercial and industrial buildings ventilation is a part of HVAC (heating, ventilation and air-conditioning) systems which are very energy intensive; usually comprising of large fans, ductwork systems, air-conditioning and heating units. In domestic buildings the primary ventilation method is renewable in the form of air infiltration and natural ventilation through windows and openings (Faye et al., 2005). Natural ventilation uses the natural forces of wind pressure and stack effect to aid and direct the movement of air through buildings. It is applicable only to a limited range of climates, microclimates and building types, perhaps best suited to a mild climate (Olsen and Chen, 2003)

Wind Induced

Wind-induced natural ventilation is based on pressure differences created by the wind. Walls and roof of a building have influence over the airflow pattern around that building (Haw et al., 2012). Khan et al, (2008) stated that wind incident on a building facade will produce a positive pressure

on the windward side and a relative negative pressure on the leeward side. This pressure difference as well as the pressure differences inside the building will drive airflow. Khan et al, (2008) also indicated that wind driven ventilation itself consists of two parameters, namely: the mean driving pressure at the opening, and fluctuating component in wind driven ventilation.

“Fluctuating pressures can cause unsteady flows around an opening and these are based on three key constituents:

1- Broad banded airflow is the influence which fluctuating surface pressures at the opening have on the airflow.

2- Resonant ventilation is caused by effects perpendicular to the opening, in particular driven by differential internal and external pressures (as cited Straw et al., 2000) elaborates that these are significantly influenced by the opening geometry and compressibility of the fluid flowing through that opening.

3- Shear layer ventilation is an artifact of ‘eddies in unstable shear layers’ caused by flow through an opening (orifice).” (Khan et al, (2008)

Stack effect

Stack effects are caused by temperature differences between the inside and outside of buildings (Haw et al., 2012). When the inside building temperature is greater than the outside, warm indoor air rises and exits so that it is replaced by cooler, denser air from below. The stack effect is dominant during periods of low wind speed and reduces in summer periods when temperature differences are minimal (Khan et al, (2008).

Hybrid system

Natural ventilation in different levels can provide sufficient fresh air, partly cooling, or sufficient natural cooling (luo et al., 2007). When natural ventilation is insufficient to provide required fresh air or natural cooling, mechanical systems are then required to provide partly the thermal comfort and fresh air (luo et al., 2007). This operation mode of using both natural ventilation and mechanical system has been named the hybrid ventilation or the hybrid system (Wang et al., 2009). This is a good approach for green buildings that making use of the building openings to save energy and provide better indoor environment (Lomas et al., 2007). The hybrid system has recently caught the attention in the green building applications. There is, however, still lack of research literature and design technology (Lin and Chuah, 2011).

Courtyard

Haw et al.(2012) highlighted that beside wind towers, there are other architectural features, such as atriums, courtyards, wing walls, and dome roofs which have been integrated into building designs that have significant influence on improving the indoor air quality. Haw et al. (2012) also stated that courtyards are transitional zones that improve comfort conditions by modifying the microclimate around the building and by enhancing the airflow in the building. Haw et al. (2012) concluded that

courtyard can provide a relatively enclosed space to channel and direct the airflow which is promoted by large openings (gates, doors, arches, etc.) and results in convective natural ventilation in and around a building.

Bansal et al, (1994) stated that having a courtyard is preferred in warm and humid climates especially when courtyard can induce ventilation due to stack effect where the wind direction should be taken into account. In summer conditions, buildings are typically a net source of heat, and the use of the natural ventilation to eliminate some of this heat from the building is very energy efficient. Most modern building designs in hot and humid regions are not equipped with passive architectural features for improving natural ventilation except through window and door openings. Nguyen et al (2011) showed that the distribution and configuration of the openings should be adjusted to improve natural ventilation and lighting. They found that courtyard house played a significant role on ventilation flow rate of the rooms facing the courtyard. Their investigation highlighted that courtyard facing windows sometimes played a more important role than street-facing windows. The research indicated that wind velocity in the courtyard house was independent from wind conditions at point in front of the house. They suggested that it is suitable and effective to employ natural ventilation, building orientation, building shape and solar shading strategies in Vietnamese climatic conditions while earth cooling, thermal insulation and high thermal mass are inappropriate. Shanthi et al (2012) studied on vernacular settlement pattern of Nagapattinam in India that breathes through the smaller indoor open spaces like courtyards because of its location in urban fabric. The buildings were designed to achieve cross ventilation through courtyards, wind catchers, etc. The study showed that during the night times the courtyard becomes a heat sink and by natural convective cooling this courtyard allows the hot air to be moved up and thereby acts as an excellent thermal regulator and creates a comfortable living environment. The horizontal surface insulates the inside from outside and creates temperature zone helping the courtyard to become a heat sink. They also presented that during summer time, due to the principle of buoyancy, low pressure develops in the courtyard and that there was an air movement from inside which is pushed towards the surrounding spaces to move out through the openings (doors, windows and ventilators) in the leeward.

Al-Sallal et al, (2013) achieved considerable improvement over the square-form house (typical Emirati house) and the basic courtyard house (envelope not yet improved) with 59% and 55% reduction in the greenhouse gas emissions and the utility bill, respectively. They suggested that their methodology could be valuable to other building professionals in the UAE who might search for a clear application model. The results of their study showed a potential in reducing the energy use of the house (compared to the improved envelope or the baseline case) by 19% for cooling and 13% for lighting and equipment; and helped to reduce the greenhouse gas emissions and the utility bill by 12%. Their search also indicated the lower part of the courtyard is the coolest part inside the building as the cooler air settles at the bottom and the hot air travels up due to stack ventilation. Since the courtyard buildings were located in the coastal region the outdoor relative humidity reaches to 95% while the indoor relative humidity is maintained around 80%. This is achieved because of the presence of the wind catchers, courtyards, etc.

Atrium

An atrium works in a similar way as courtyard and is used to provide comfort through a progressively acceptable transmission of the external environment to the inside. Accepting that the

atrium is a common feature in large public and commercial buildings, it is important to ensure that it does not commit the building to a lifetime of high energy consumption. A lot of investigations on atria, solar chimneys, Trombe walls, and double facades were carried out. The optimum shape and the system characteristics were reported by experimental, analytical, and numerical investigations. The atrium would provide the parent building with daylight, natural ventilation, and if south facing, useful passive solar gains. All these functions are potentially energy saving (Assadi et al., 2011). Besides providing daylight for adjacent buildings, atrium can reduce cooling energy consumption by using proper methods of natural ventilation caused by temperature difference as well as by pressure difference between outside and inside of atrium. Since atriums are usually the focal point of the building and communicate with other spaces, atrium's pressure should be considered as the datum that all other spaces are compared to. The conditioning and ventilation of the atrium usually involves large quantities of air (ASHRAE 1999).

Zhai et al (2011) revealed that hybrid ventilation allows a building to capitalize on the benefits of natural ventilation, with insurance that the building can operate at a desirable thermal comfort level during extreme outdoor conditions. Hybrid ventilation can thus be implemented in a wider range of climates, where purely natural ventilation is insufficient to provide all cooling needs of a space. Tall atrium space and solar radiation transmitted in the room promote temperature stratification and consequently enhance buoyancy-driven airflows in the building as Karava et al (2012) explored mixed-mode cooling strategies in multi-story buildings with hybrid ventilation and high levels of exposed thermal mass. Their research showed that the hybrid ventilation system operates around 30% of the time during the cooling season (April-October) and free cooling can cover a significant part of the cooling requirements. The study also revealed that amount of heat removed by convection with an air stream at an average 12°C was estimated to be 5 times larger than with an air stream at an average 18°C. Assadi et al, (2011) presented the relation between the passive heating and ventilating effect and the dimension of an atrium and the parent building. Considering the results obtained, they concluded that it is not possible to design a building fully heated and ventilated by buoyancy driven flows and stack effect in an atrium building. Woods et al (2009) presented a model to describe a strategy for mixing natural ventilation in an atrium style building in which the rooms surrounding the atrium are able to vent directly to the exterior and also through the atrium to the exterior. In their study model, the atrium provides the space for the pre-heating through mixing, and this air is then exchanged with the rooms leading from the atrium. In winter, they proposed mixing ventilation via the atrium and in summer using upward displacement ventilation with inflow through the office/classroom windows and then into the atrium, with the outflow being at the top of the atrium. In and Chuah (2011) highlighted that natural cooling can be used for large spaces in the three cities of Taiwan due to the stack effect in cooler months. In comparison Taipei has greater potential of natural cooling, with availability of natural cooling two months longer than Kaohsiung. They stressed that for a large space of above 6 m, opening ratio of greater than 0.9% can satisfy the requirement of fresh air rate. The results of study underlined that weak cooling potential would require a hybrid natural cooling with mechanical systems to achieve thermal comfort. In and Chuah,(2011) concluded that the number of days of weak cooling potential is found to be 92 for Taipei, 30 for Taichung, and 61 for Kaohsiung cooler months generally have lower humidity ratio in the outdoor air, and therefore sensible cooling effects were studied

Shafqat and Oosthuizen (2012) studied in a three-story atrium space (floors 14th-16th) with a hybrid solar-assisted natural ventilation system in the Engineering Building of the Concordia University, Montreal, Canada. They described a two-mode system using buoyancy-driven and mechanical cooling

systems or a combination of both at different times of the day or season. It was seen that in the presence of solar radiation, free convection effects are shown by the formation of air stream moving upward around the hot surfaces (Shafqat and Oosthuizen, 2012). Higher air temperature stratification in the three-story atrium was observed in the case where the natural ventilation system was OFF and the blinds were closed (Shafqat and Oosthuizen, 2012). Lower temperature stratification with the natural ventilation system ON is due to the strong convection (Shafqat and Oosthuizen, 2012). Strong stack effect creates inflow on lower floors and results in high air flows at floor grilles and exhaust (Shafqat and Oosthuizen, 2012). Shafqat and Oosthuizen (2012)'s concluded that CFD proves to be a reliable tool for modeling flow and heat transfer in an atrium space integrated with hybrid ventilation system including conduction, convection and radiation heat transfer phenomena. It is possible to analyze the flow rate and temperature distributions within the atrium numerically (Shafqat and Oosthuizen, 2012). In recent years, CFD has become quite widely used in the design and operation of buildings and building systems and is proving to be an extremely valuable tool in the design of buildings and building systems (Shafqat and Oosthuizen, 2012). Kobayashi et al (2013) used CFD analyzes and focused on "monitor roof" which has the potential to promote wind induced natural ventilation, and aims to evaluate its ventilation performance. The ventilation air movement is beneficial to cool occupants directly and also to remove heat stored in the room (Kobayashi et al, 2013). In their case study with surrounding buildings, it was shown that the room could almost never be ventilated if only the wall openings were used, and that by utilizing monitor roof openings, larger ventilation rate could be obtained. CFD results showed that the flow rate could be increased by controlling the monitor roof openings when the surrounding buildings exist. They concluded that due to effect of turbulence the ventilation performance is somewhat underestimated in their case study.

Naghman et al (2008) observed in hot and humid conditions, due to the low-temperature difference the indoor and outdoor temperature, the stack ventilation method is unable to create higher airflow to achieve good air changes for the building occupants. Haw et al (2012) explained that when there is an increase in the velocity of a fluid, it decreases its static pressure. Due to this phenomenon, there is negative pressure at the contraction of a Venturi Tube (Haw et al., 2012). Haw et al (2012) also revealed that the Venturi shaped roof wind-induced natural ventilation tower has a great potential application in buildings under hot and humid climate. Haw et al (2012) discovered that the Venturi shaped roof is effective in providing significant negative pressure to induce air movement. Analysis showed the wind-induced natural ventilation tower can produce high air changes per hour (ACH) for indoor building environment in the hot and humid climate (Haw et al 2012). It can produce sufficient airflow rate and ACH for naturally ventilated buildings (Haw et al 2012). Haw et al (2012)'s study also showed that the aerodynamic performance of the Venturi shaped roof of the wind-induced natural ventilation tower can produce sufficient low pressure required to induce fresh air from outdoor into indoor spaces of building.

The conditioning and ventilation of the atrium usually involves large quantities of air, so the infiltration or ex-filtration is an even smaller percentage of the total quantity of air being handled. This may require controls and instrumentation to be of a higher quality and accuracy than is typical in the remainder of the building (ASHRAE 1999 Applications, Chapter 51.12).

Stack effect and thermal currents may produce unanticipated influences on pressure relationships if not accounted for in the design. Therefore the atrium systems should be designed to

allow some flexibility at start-up and in the future to adjust the balancing of the systems (ASHRAE 1999 Applications, Chapter 51.13)

RESEARCH METHODS:

This paper aims to have an approach to the natural ventilation on central open to sky spaces by examining samples of modern building. Most of the examples have been built and have demonstrated that they function. The atrium provides several opportunities for energy-saving techniques such as night-cooling and heat exchangers.

With this aim, following the literature review, case studies have been carried out. Four projects having atria have been analyzed with respect to the ventilation. These projects are: East gate in Harare, Zimbabwe; Masdar City in Abu Dhabi, in the United Arab Emirates; Commerzbank head quarter in Frankfurt, in Germany; and The Genzyme Center in Cambridge, in United States of America.

EXAMINATION OF PROJECTS

East gate

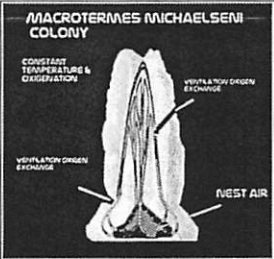
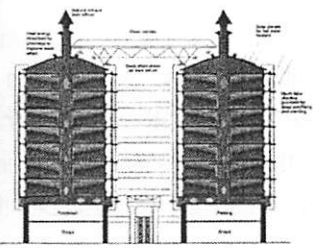

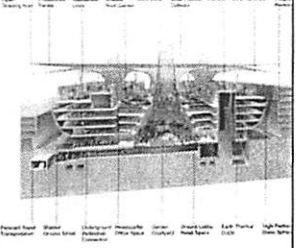
The Eastgate Centre is a shopping center and office block in central Harare, Zimbabwe (Figure 2). Because of its altitude, Harare has a temperate climate despite being in the tropics, and the typical daily temperature swing is 10 or 14 °C. This makes a mechanical or passive cooling system a viable alternative to artificial air-conditioning (<http://www.thinktosustain.com>). Passive cooling systems are particularly appropriate for this part of Africa because, long before humans thought of it; passive cooling was being used by the local termites (Figure 1) (<http://en.wikipedia.org>). The Eastgate building is modeled on the self-cooling mounds of *Macrotermes michaelseni*, termites that maintain the temperature inside their nest to within one degree of 31 °C, day and night, - while the external temperature varies between 3°C and 42°C. Eastgate uses only 10 percent of the energy of a conventional building its size (<http://www.architectsforpeace.org> /Mark Chown, 2003), saved 3.5 million in air conditioning costs in the first five years (<http://biomimicryinstitute.org>). Passive cooling works by storing heat in the day and venting it at night as temperatures drop. (<http://en.wikipedia.org>)

- 1- *Start of day: the building is cool.*
- 2- *During day: machines and people generate heat, and the sun shines. Heat is absorbed by the fabric of the building, which has a high heat capacity, so that the temperature inside increases but not greatly.*
- 3- *Evening: temperatures outside drop. The warm internal air is vented through chimneys, assisted by fans but also rising naturally because it is less dense, and drawing in denser cool air at the bottom of the building.*
- 4- *Night: this process continues, cold air flowing through cavities in the floor slabs until the building's fabric has reached the ideal temperature to start the next day.*

MASDAR CITY

Masdar City is a project in Abu Dhabi, in the United Arab Emirates (<http://en.wikipedia.org>). At the center of Masdar City lies its first building, the Masdar Headquarters, which will become the new

home of Abu Dhabi's Future Energy Company, as well as the secretariat of the International Renewable Energy Agency (IRENA). The design of the Masdar HQ follows the successful formula of combining passive design strategies with active systems strategies and renewable energy to achieve its energy savings goals. But unlike other projects where sustainable strategies appear to be an afterthought, the building's basic forms appear to have been derived from these strategies (www.carboun.com). One of the main form making strategies is a ventilation strategy derived from the region's traditional ventilation elements (<http://www.carboun.com>). Before the recent discovery of oil in the gulf regions, its hot and humid climate led to the development of a traditional architecture that encourages air movement in order to improve comfort conditions. The design of Masdar HQ is dominated by 11 cone-shaped adaptations of traditional wind towers which act as outlet wind towers drawing hot air upwards during the day (<http://en.wikipedia.org>). The optimized form of these cones (also called wind cones) uses stack ventilation as well as the wind above the building to create a negative pressure at the top of the cones, which in turn creates air movement in the interior courtyard spaces at the base of the cone and draws cooler air up through the subterranean levels of the city below stack ventilation as well as the wind above the building (<http://www.carboun.com>). At night, the wind cones reverse roles acting as inlet wind towers drawing cool night air downwards to cool the building structure (Figure 3) (<http://www.carboun.com>). Computational Fluid Dynamics (CFD) studies were used to analyze the effect of outside wind on air movement inside the wind cones and to optimize the location of the air inlets for more uniform ventilation (Figure 4) (<http://www.carboun.com>).

			
<p>Figure 1: Section of the local termite's nests in Harare, Zimbabwe</p>	<p>Figure 2: Section of the East gate building in Harare</p>	<p>Figure 3: Section of the cone in Masdar City in Abu Dhabi, in the United Arab Emirates</p>	<p>Figure 4: Section of the office building including cones for natural ventilation in Masdar City</p>

Commerzbank head quarter

Commerzbank Tower is a 56-storey, 259 m skyscraper in the Innenstadt district of Frankfurt, Germany (figure 5) (<http://en.wikipedia.org>). The building was designed to be naturally ventilated for 60% of the year, with the sky gardens allowing natural ventilation during shoulder seasons and was expected to reduce energy consumption by up to 50% compared to an equivalent air conditioned office (<http://www.fosterandpartners.com>).

With an understanding of the factors that determine comfort in relation to natural ventilation in atria, designers may select design strategies that provide human comfort and control microclimate.

"Natural ventilation is suitable for maintaining interior comfort for as much as two-thirds of the year. The perimeter offices are ventilated through the double-skin, while the inner offices looking onto the atrium are supplied indirectly with fresh air. As noted before, the atrium spaces can be ventilated significantly, both to supply the necessary fresh air for the offices and to control the microclimate of the gardens and the atrium." (<http://cmiserver.mit.edu>).

Breathing Buildings has developed an innovative low energy approach to the ventilation of buildings where rooms are connected to a central atrium. The system can be deployed in buildings with one storey as well multi-storey buildings with respect to reach environmentally friend building.

"The central atrium provides natural ventilation throughout this "ecological high-rise." The tower has natural ventilation with individually operable windows as well as transverse ventilation. The environmentally-friendly design earned the building the 'eco-high-rise' label. The building has an equilateral triangle plan. The layout of the floor levels creates a helix with four-story-high cut-outs, creating space for landscaped terraces called 'sky gardens'. The sky gardens, together with the central 200m-high atrium, maximize the use of daylight and provide natural ventilation and unique views through the building"(<http://www.arup.com>).

The Genzyme Center in Cambridge

Genzyme building with 32.500 m² is a twelve-story, office building with a striking all-glass exterior and a soaring internal atrium. The building is one of the most environmentally responsible office buildings ever built in the anchor of an urban revitalization project in the Kendall Square neighborhood of Cambridge, Massachusetts in United States. "The atrium provides light, air, views, and social spaces, bringing the Genzyme building to life and venting air through the stack effect. Occupants have control over their climate through thermostats and operable windows. A large atrium relies on the stack effect to exhaust the building. Fresh air is available through operable vents in selected areas with a unique four-foot deep, inhabitable double-skin façade. The air conditioning turns off automatically. Some windows are auto-mated to open for night cooling Mechanical ventilation delivers and exhausts air in the offices" (<http://blog.yam.com>).

Asma (2005) stated the Genzyme building can be compared to a human body: sensory input from a roof-top weather station allows it to respond to environmental conditions by adjusting its lighting and ventilation systems. Asma (2005) concluded the three main features that drive air through the building are the twelve-story atrium, the four-foot deep double façade, and the operable curtain wall windows. The ventilation system is a combination of user (manual) control and building management system's (automatic) control (Asma Syed, 2005).Olmstead and Neely, (2005) observed that atrium provides several opportunities for energy-saving techniques such as night-cooling and heat exchangers. First, the windows on the first floor may automatically open at night to flush out the building and cool the concrete frame, using its thermal mass to absorb the heat loads during the day, thus reducing the air conditioning demand. Secondly, during winter, the heat exchangers at the exhaust fans warm the incoming, mechanically delivered air.

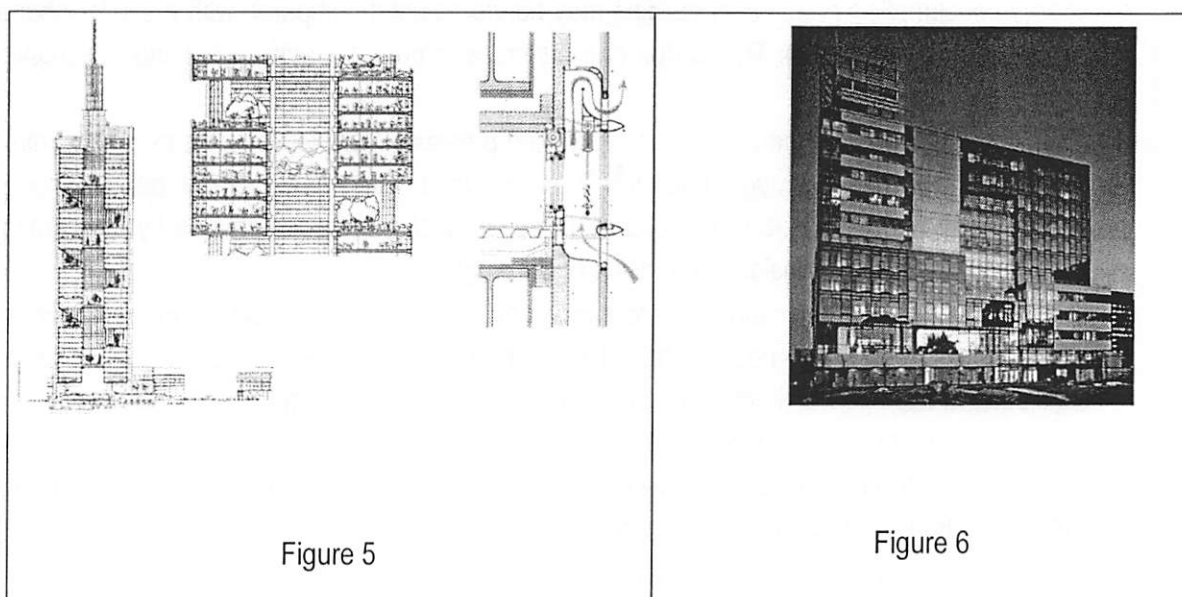


Figure 5) left to right: a) Section of the head quarter Commerzbank head quarter. b) Section of the sky garden in Commerzbank. c) Section of the double façade in Commerzbank
 Figure 6) Genzyme Center in Cambridge

DISCUSSION

Natural ventilation can work in most occupied buildings including offices, universities, schools, visitor centers and council buildings. It can work on its own or alongside other energy-efficient ventilation techniques. It has the potential to reduce first costs and operating costs for some commercial buildings while maintaining ventilation rates consistent with acceptable indoor air quality. An atrium can be used as ventilation air supply unit, extract unit or as both at the same time. Atria also have the potential for collecting solar heat and providing protection against wind in building.

CONCLUSIONS AND RECOMMENDATIONS

More knowledge on these issues is essential to future practice and to the use of natural ventilation in buildings in the future.

- The design process for hybrid ventilation (natural and mechanical combination) requires extensive environmental simulation in order to take calculated risks. Although this process is often expensive and time-consuming, it is entirely necessary to ensure that the building will perform as expected.
- The use of renewable energy resources, including both active and passive systems, needs to be met in the design stages. Using natural ventilation is combined with sustainable designs and modern aspects of life.
- One of the common natural ventilation and cooling technique is the use of atria and courtyards in buildings.
- An atrium can act as a buffer thermal zone where comfort conditions might not be strictly controlled. It can provide passive solar gains, view to the outside, increase availability of daylight into the adjacent spaces and enhance the quality of the indoor environment.

- The incorporation of an atrium into a building will not automatically lead to energy savings. The energy consumption of adjacent building may be increased if compared with a similar-shaped building without an atrium. This is due to the increased need for artificial lighting, mechanical ventilation.
- Natural ventilation uses the natural forces of wind pressure and stacks effect to aid and direct the movement of air through buildings. Wind-induced ventilation method performance is independent of low temperature difference however stack effects are caused by temperature differences between the inside and outside of buildings.
- Stack ventilation by itself cannot create enough air flow to achieve good indoor air quality for building occupants under hot and humid climatic conditions. The low performance of stack ventilation in hot and humid climate is due to the low temperature differences between indoor and outdoor temperature of a building.
- Cooling by ventilation is most effective when inlets are placed at the bottom of the atrium, and sufficient exhaust outlets are located at the top.
- Stack effect is more prominent for taller buildings
- Wind-induced air-flow rates through openings at upper levels of tall buildings might be very high. This is particularly obvious for façade with high window-to-wall area ratio.
- Walls and roof of a building have influence over the airflow pattern around buildings.
- Hybrid ventilation techniques often incorporate a solar chimney or an atrium that is used to promote buoyancy forces and optimize air movement. Hybrid ventilation can result in considerable HVAC energy savings in warmer climates, both humid sub-tropical, tropical, and arid.
- Since modern ventilated buildings use innovative ventilation strategies which have not yet been tried and tested, it has become important to establish CFD modeling building.
- The application of CFD to atrium type buildings has received some attention but because of the complexity of the flows involved and of the interaction between the various modes of heat transfer there remain some concerns about the accuracy of the results obtained.
- It is more difficult to size a natural ventilation system than it is a mechanical system

Overall, the proposed methodology provides a useful procedure for building designers to quantify the buoyancy-driven and wind induced natural ventilation at the initial design stage of an energy-efficient atrium building. It should be mentioned that the CFD modeling approach could lead designer and decision maker to touch energy efficient in building.

THE FUTURE STUDIES

The energy consumption of the buildings is quite high and may increase considerably in the future because of the improving standards of life and increasing penetration of air conditioning. This study revealed that there are series of details which have significant impact on natural ventilation in atrium building types such as climate conditions building shape or height, orientation and internal loads, the insulation levels, wind directions well as wind speed, impact of adjusting building characteristics on the buoyancy ventilation performance, the ventilation requirements and etc. It is evident that additional research is necessary in order to optimize the existing atrium building systems and develop new ones.

REFERENCES

- ASHRAE 1999 Applications, Chapter 51.12
ASHRAE 1999 Applications, Chapter 51.13
Asma Syed, (2005) A Model for Green Building in the 21st Century, ENVS 634 U.S. Green Building Council. LEED Certified Project Case Study: Genzyme Corporation (2003).
Assadi M. K., Dalir F., Hamidi A. (2011) Analytical model of atrium for heating and ventilating an institutional building naturally Energy and Buildings 43 2595–2601
Al-Sallal K. A., Al-Rais L., and Bin Dalmouk M., (2013) Analytical model of atrium for heating and ventilating, Renewable Energy 49 80-84
Bansal N.K., Hauser G., and Minke G. (Ed.), (1994) Passive building design: a handbook of natural climatic control. Amsterdam, Netherlands: Elsevier Science B.V.
Building Simulation an Aide to Design, Eighth International IBPSA Conference Eindhoven, Netherlands, August 11-14
Christian Noble, Commerzbank: A Sustainable Skyscraper, Structure Innovations, Architecture 489, 68-78
Haw L. C., Saadatian O., Sulaiman M.Y., Mat S., and Sopian K. (2012) Empirical study of a wind-induced natural ventilation tower under hot and humid climatic conditions, Energy and Buildings 52 28–38
Khan N., Su Y., and Riffat S. B., (2008) A review on wind driven ventilation techniques, Energy and Buildings 40 1586–1604
Karava P., Athienitis A.K., Stathopoulos T., Mouriki E. (2012) Experimental study of the thermal performance of a large institutional building with mixed-mode cooling and hybrid ventilation Building and Environment 57 313-326
Kobayashi T., Chikamoto T., and Osada K. (2013) Evaluation of ventilation performance of monitor roof in residential area based on simplified estimation and CFD analysis, Building and Environment 63 20-30
Lin J.T., and Chuah Y. K., (2011) A study on the potential of natural ventilation and cooling for large spaces in subtropical climatic regions, Building and Environment 46 89-97
Lomas KJ, Cook MJ, and Fiala D. (2007) Low energy architecture for a severe US climate: design and evaluation of a hybrid ventilation strategy, Energy and Buildings 39 32-44.
Luo ZW, Zhao JN, Gao J, and He L. (2007) Estimating natural-ventilation potential considering both thermal comfort and IAQ issues, Building and Environment 42 2289-2298.
Naghman K., Yuehong S., Riffat S.B. (2008) A review on wind driven ventilation techniques, Journal of Energy and Buildings 40 568–1604.
Nguyen A., Reiter S. (2011) The effect of ceiling configurations on indoor air motion and ventilation flow rates, Building and Environment 46 1211-1222
Nguyen A., Tran Q., Tran D., and Reiter S., (2011) An investigation on climate responsive design strategies of vernacular housing in Vietnam, Building and Environment 46 2088-2106
Olmstead D., Neely D., (2005) A Case Study of Sustainable Building Strategies, Massachusetts Technology Collaborative
Straw M.P., Baker C.J., and Robertson A.P., (2000) Experimental measurements and computation of the wind induced ventilation of a cubic structure, Journal of Wind Engineering and Industrial Dynamics 88 213–230.
Shafqat H., and Oosthuizen P. H., (2012) Validation of numerical modeling of conditions in an atrium space with a hybrid ventilation system, Building and Environment 52 152-161
Shanthy P. R., Sundarraja M.C., Radhakrishnan S., and Vijayalakshmi L. (2012) Solar passive techniques in the vernacular buildings of coastal regions in Nagapattinam, TamilNadu-India – a qualitative and quantitative analysis, Energy and Buildings 49 50–61

- Woods A. W., Fitzgerald S., and Livermore S., (2009) A comparison of winter pre-heating requirements for natural displacement and natural mixing ventilation, *Energy and Buildings* 41 1306–1312
- Wang X, Huang C, and Cao WW., (2009) Mathematical modeling and experimental study on vertical temperature distribution of hybrid ventilation in an atrium building, *Energy and Buildings* 41 907-914.
- Zhai Z. J., Johnson M., and Krarti M., (2011) Assessment of natural and hybrid ventilation models in whole-building energy simulations, *Energy and Buildings* 43 2251–2261

http://en.wikipedia.org/wiki/Eastgate_Centre,_Harare

<http://www.thinktosustain.com/2012/08/natures-design-helps-keep-buildings-cooler/>

<http://biomimicryinstitute.org/case-studies/case-studies/termite-inspired-air-conditioning.html>

<http://www.architectsforpeace.org/mickprofile.php>

http://en.wikipedia.org/wiki/Masdar_City

http://en.wikipedia.org/wiki/Commerzbank_Tower.

<http://www.carboun.com/sustainable-design/masdar-headquarters-the-first-positive-energy-building-in-the-middle-east/>

<http://www.fosterandpartners.com/projects/commerzbank-headquarters/>

<http://cmiserver.mit.edu/natvent/Europe/commerzbank.htm>

<http://www.arup.com/Projects/Commerzbank.aspx>

<http://blog.yam.com/fycdvan/article/19564864>

<http://behnisch.com/projects/104>

AN INVESTIGATION INTO THE THERMAL BEHAVIOR OF COURTYARDS

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ABSTRACT

Buildings have been recognized as major energy consumers. Courtyards, as significant architectural elements affecting lighting, as well as heating and cooling, can affect buildings energy consumption. This research aims to examine thermal performance of material type used on courtyard adjacent space. Following the literature survey, analyses will be carried out using DesignBuilder/Energyplus. In this simulation, different climates in Turkey have been taken into account. The research gives valuable feedback to professionals and academicians especially with respect to the effect of the courtyard adjacent spaces material on the energy performance. The findings are expected to help increase in energy efficiency and thermal comfort as well as decrease in CO₂ emission.

Key Words: thermal behavior, office buildings, courtyard, material type.

INTRODUCTION

The concerns over global warming and need for reduction of high emission of greenhouse gases, ever-growing energy consumption and higher global oil prices suggest the need for long-term demand for the utilization of strategies for indoor climate modification in promoting comfortable indoor environment (Givoni 1994). Feng et al (2009) expressed that the building industry is considered to be an important contributor to the total national energy consumption. It is expected that the proportion of building energy consumption in national energy consumption will keep rising in the coming years (Feng et al (2009)). Cai et al, (2009) stated that due to the improvement of the living requirements and the rapid urbanization, there will be a dramatic increase in the amount of energy consuming appliances (such as air-conditioners) and urban building areas, which will result in more energy consumption. For instance, Steemers, (2003) highlighted that in the UK, buildings account for about half of all energy consumption, compared to 41% in Europe and 36% in the USA. Energy efficiency of built environment in urban areas is an important factor in reducing the challenges of climate change, resource diminution and wider environmental issues (Steemers, 2003). The modern day practice does not give due respect to passive and natural environment control measures in buildings. With modern materials and technology, the buildings of present architectural style results in high energy consumption, in an attempt to provide thermal comfort indoors.

Designing without taking into consideration proper design of building form, orientation, and envelope can lead to considerable increase in heat gains and energy usage. Givoni (1994) analyzed several specific issues related to adjacent outdoor spaces such as courtyards and internal patios. With

some details, courtyards can provide a pleasant outdoor environment and also improve the indoor thermal conditions (Givoni, 1994). The courtyard can modify the climatic conditions of the ambient environment and thus improve the indoor climate by shading the walls, increasing the insulation value of the adjacent walls by dense and high shrubs and vines, and lowering the air temperature by evaporative cooling systems such as wetted pavement, wet walls, or a small pond with a fine spray (Givoni, 1994).

Currently, efforts are made to determine the influence of windows on the energy consumption and economy of high-rise buildings. The area and orientation of glazing have a great impact on building energy usage (Al-Sallal et al, 2013).

Modeling energy usage in buildings is an important step towards designing and implementing policy measures related to energy savings in buildings. Simulation of buildings' thermal-performances is necessary to predict comfort of the occupants in buildings and to identify alternate mechanical control-systems for achieving better indoor thermal environments.

The primary focus of this study is to examine the influence of glazing type on window to wall ratio in different climates of Turkey on a developed model of courtyard building. The model was created in Design Builder which was used in this study as the simulation tool. The simulations were considered as a temporary file of Design Builder based on ASHRAE due to Energy Plus calculation.

LITERATURE REVIEW

One of the significant spaces in buildings is courtyard. Frequent utilisation of this space especially in hot-arid, hot-humid and cold climate reveal its importance in providing comfort to occupants. Edwards et al (2006) highlighted that courtyards are found in all climates and locations such as Iran, China and Middle East. They provide a private space for social and leisure activities, and modify local microclimate. Muhaisen and Gadi (2005) highlighted that the courtyard has been one of the most characteristic forms of residential architecture in warm climates. Sadafi et al, (2011) studied thermal performance of terrace housing by exploiting internal courtyard in tropical climate of Kuala Lumpur, Malaysia, using ECOTECT software as simulation software. The results from simulation analyses indicated that, applying internal courtyard in the terrace house improves natural ventilation and thermal comfort in spaces with openings to the outside environment (Sadafi et al, 2011). It has been shown that the zones adjacent to the courtyard with suitable openings in two sides can release the heat through natural ventilation resulting in better thermal condition (Sadafi et al, 2011). Sadafi et al, (2011) also highlighted that suitable shading devices as well as suitable materials for the internal courtyard's walls can diminish the influence of solar radiation penetration.

Dili et al, (2010) have conducted qualitative and quantitative analyses of the passive environment control system of vernacular residential architecture of Kerala, India. They highlighted that continuous heat exchange happens with the cooler surfaces and then the cooler air of the courtyard, as the air moves from outside to inside. They also indicated that due to cooler air settling at the bottom, lower part of the courtyard is the coolest part inside the building. They concluded that highly insulated building envelope for thermal protection of external walls from solar radiation and the pitched roof for protection from heavy rain together contribute to a passive environment control system in Kerala vernacular residential architecture.

Yang et al, (2012) developed a temporal 3D air and surface temperature model and simulated a courtyard located in Beijing to understand the energy exchanges in an ideal courtyard. The impact of

design parameters such as the courtyard geometry, and thermal properties of building materials was studied to determine the relationship between these parameters and the micro-scale thermal environment of the courtyard (Yang et al, 2012). Yang et al, (2012) revealed that increasing courtyard height, thermal mass and material conductivity intensify the nocturnal micro-scale heat island effect in summer. Increasing thermal mass, surface reflection and conductivity efficiently reduce the peak temperature during daytime, which leads to a micro-scale urban cool island phenomenon in winter time. Yang et al, (2012) highlighted that among all 4 parameters (height, surface reflection and thermal mass as well as material conductivity) the height of the courtyard is found to be the most influencing whereas the surface reflection has found to have the least influence on the courtyard thermal environment.

Muhaisen and Gadi (2005) showed that changing the form's proportions in circular model significantly influences shading or exposure potential of the internal courtyard envelope and that shallow courtyards perform better than the deeper ones. Muhaisen and Gadi (2006a) used computer tool (IES) to carry out the effect of solar heat gain on the energy demand of courtyard building form with different proportions. They found that courtyards having deep forms require low energy for cooling in the summer. Muhaisen and Gadi (2006b) stressed that in polygon models deep courtyard forms with any geometry achieve maximum internal shaded areas in the summer whereas in winter, shallow forms provide sunlit areas. Muhaisen (2006) carried out a modeling study into the effect of rectangular courtyard proportions on the shading and exposure conditions on the internal envelope of the form in four different locations. The outcomes showed optimum courtyard height to obtain a reasonable performance in the summer and winter as three stories in hot humid climates, two-story in hot dry and temperate climates, and one-story in a cold climate (Muhaisen, 2006).

Aldawood (2006) highlighted that courtyard spaces are affected by the outdoor climate conditions more than any other spaces in the building because of the glazed materials used for courtyard walls' skylights. Al-Masri and Abu-Hijleh (2012) compared conventional and courtyard buildings by using computer simulation (Virtual Environment by Integrated Environmental Solutions) to determine the overall energy consumption, energy savings potential and available daylight levels. The simulation calculated effects of number of floors, type of glazing, wall thickness, and insulation type as well as insulation thickness on the performance of a courtyard type (Al-Masri and Abu-Hijleh, 2012). The result showed 11.16% reduction in the overall year-round energy consumption in optimized courtyard model compared to the reference conventional form building (Al-Masri and Abu-Hijleh, 2012). Assessment between the daylight performances of the two forms highlighted that the courtyard form provides more usable daylight without excessive glare (Al-Masri and Abu-Hijleh, 2012).

Luis and Perez-Garci (2004) studied seasonal control of the solar gains on the roof apertures. Luis and Perez-Garci (2004) studied on refurbishment of an open courtyard by installing an innovative roof to maximize solar gains during the winter months and to minimize thermal loads in the summer.

Heras et al (2005) analyzed the energetic performance of a courtyard covered by saw tooth roof in the building of University of Almeria in Spain. Thermal evolution in typical summer and winter days and thermal comfort analyses showed a good thermal behavior in winter; stratification did not appear during all year and this fact produced overheating in summertime (Heras et al, 2005). Heras et al (2005)'s study revealed that around the noon an increase in the air velocity happens, consequently the chimney effect is greater during these hours and that the annual thermal loads required to obtain comfort conditions are lower in courtyard than in a conventional saw tooth roof.

There are series of details which have significant impact on thermal performance of courtyard building types such as climate conditions, building shape or height, orientation and internal loads, height of the building, window to wall ratio, glazing type, the insulation levels, wind directions well as wind speed, impact of adjusting building characteristics on the buoyancy ventilation performance, the ventilation requirements and etc. It is evident that additional research is necessary to optimize the existing courtyard building systems and develop new ones.

RESEARCH METHODS

This paper aims to examine the influence of glazing type on window to wall ratio in different climates of Turkey on a developed model of courtyard building. The model was created in the Design Builder which was used in this study as the simulation tool. Simulation packages for predicting building performance in terms of energy and comfort are becoming increasingly important in the planning process. The analyses carried out within the scope of this research were based on two main building energy performance simulation tools, namely EnergyPlus and DesignBuilder.

The EnergyPlus was used for calculating of total energy consumption of building by changing different glazing type on various windows to wall ratio in different climates. As EnergyPlus has been validated under the comparative Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs BESTEST/ASHARE STD 140, it is reliable (Henninger, and Witte, 2001).

DesignBuilder, as GUI (Grafical Usage Interface) for EnergyPlus, the DesignBuilder is the most comprehensive interface for EnergyPlus available today. Its current version (v3.2.0.008 beta) includes a simplified CAD interface, templates, wizards, and most compact air system configurations of EnergyPlus.

The Courtyard Model created within the scope of this research:

The courtyard model has been designed based on the criteria obtained from the literature survey. Courtyard thermal performance is mainly affected by the solar radiation penetration of the internal envelope, which is dependent on the courtyard geometrical parameters and the sun's position. Muhaisen and Gadi (2005) stressed that shallow courtyards perform better in winter time. Muhaisen and Gadi (2006b) highlighted that deep forms require low energy for cooling in summer.

The courtyard model has been designed to be located within an office building considering Perez-Lombard et al (2008)'s study. Perez-Lombard et al (2008) stated that offices and retail spaces are amongst the most energy intensive typologies in the nondomestic building sector. They alone account for over 50% of total energy consumption for non-domestic buildings. Perez-Lombard et al (2008) advised analysis of energy demand of the non-domestic building stock with office buildings. The reason which they stressed is not only the energy intensity of the office buildings but their constant increase in total floor area coupled with increase in lighting, IT and air conditioning. The other important reason which Perez-Lombard et al (2008) emphasized is office buildings are quite uniformly distributed across the buildings stocks in developed countries with three key energy end uses, HVAC, lighting and appliances, adding up together to around 85%.

This study tries to examine the influence of glazing type on window to wall ratio in different climate of Turkey on proposed model of courtyard building. In order to reach to aforementioned goal, two open central courtyard surrounded by adjacent spaces were modeled in Designbuilder. Four office

areas face to the courtyard and circulation areas were located in the corners of the building. In terms of investigation 3-stories and 6-stories square shaped courtyards were modeled. Each space was separated completely from any environmental thermal changes by four adiabatic walls from the outdoor. Central courtyard area was 400 m², with 20 m length 20 m width. In the adjacent spaces floor to floor height was 3.50m and the depth of the office area was designed to be 10m. The internal environment of the four office spaces was modeled as fully conditioned.

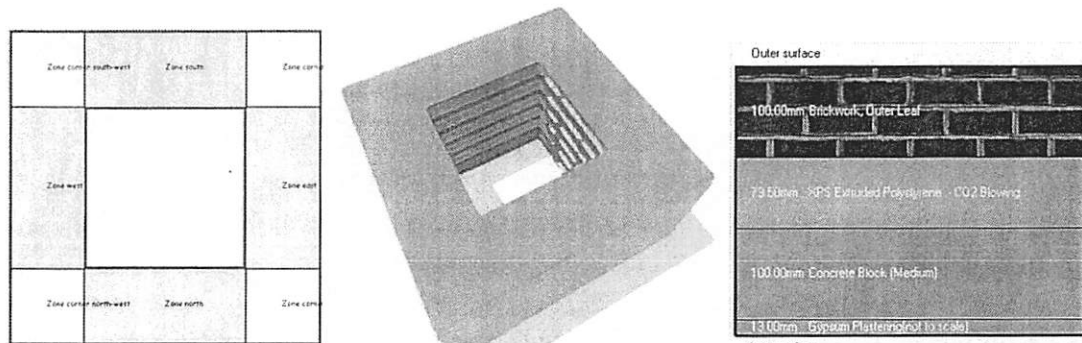


Figure 1: The courtyard model created within the scope of this research

The spaces were set to a constant temperature of 24°C. All spaces were assumed to have recessed fluorescent with lighting energy. The type of artificial heating was selected as natural gas and electric for cooling system. All requirements including schedules such as lighting schedule, wall infiltration schedule, window infiltration schedule, daylight schedule and all design aspects needed to conduct the all adjacent spaces were assumed to be fully conditioned. For the purpose of analysing the influence of climate on the thermal performance of model and their different alternatives, three locations in the Turkey were selected. Each location represented a different climatic region. The selected locations were Erzurum for the cold climate, Diyarbakir for hot-dry climate, and Istanbul for temperate climate. Glazing percentage varied from 0 to 100% for the simulations. In order to understand differences in total energy consumptions of the modeled courtyard building clearly, simulations have been carried out for two types of glazing, namely: single and triple glazing (Table 1).

Single Glazing Types		Triple Glazing Types	
1. Sgl Ref-A-L Clr 6mm		1. Trp LoE Film (33) Bronze 6mm/13mm Air	
2. Sgl Ref-D Clr 6mm		2. Trp LoE Film (44) Bronze 6mm/13mm Air	
3. Sgl Ref-A-M Clr 6mm		3. Trp LoE Film (55) Bronze 6mm/13mm Air	
4. Sgl Ref-C-M Clr 6mm		4. Trp LoE Film (66) Bronze 6mm/13mm Air	
5. Sgl Ref-B-L Clr 6mm		5. Trp LoE Film (55) Clr 6mm/13mm Air	
6. Sgl Ref-C-H Clr 6mm		6. Trp LoE Film (66) Clr 6mm/13mm Air	
7. Sgl Ref-B-H Clr 6mm		7. Trp LoE Film (77) Clr 3mm/13mm Air	
8. Sgl Ref-D Clr 6mm		8. Trp Clr 3mm/30mm air for mid-pane blinds	
9. Sgl Blue 6mm		9. Trp Clr 3mm/13mm Arg	
10. Sgl Grey 3mm		10. 4-12-4, coated, argon filed	
11. Sgl Bronze 3mm		11. Trp LoE Film (88) Clr 3mm/13mm Air	
12. Sgl Green 3mm		12. Trp LoE (e2=e5=0.1) Clr 3mm/13mm Arg	
13. Sgl Clear 3mm			
14. Sgl Low Iron 5mm			
15. Sgl LoE (e2=2) Clr 3mm			

Sgl	Single pane
Dbl	Double pane
Xmm	X = thickness of glass panes in mm
Xmm/Ymm	X = thickness of glass panes, Y = gap thickness
Clr	All panes are clear glass
Tint	One pane is tinted
Low Iron	Glass pane with low iron content
Pyr	Pyro lytic coating
Ref-X-Y	One pane has a metallic reflective coating where : X =A: stainless steel coating X =B: titanium coating X =C: pewter coating X =D: tin-oxide coating Y =L: low-transmittance coating Y =M: medium-transmittance coating Y =H: high-transmittance coating
LoE	Low-emissivity metallic coating on one or more pane
eX=Y	Low-emissivity coating on pane surface X with emissivity Y (surfaces are numbered from outside to inside)
Film (XX)	Coated polyester film with nominal visible transmittance of XX percent
Air	Between-pane gas fill is air
Arg	Between-pane gas fill is argon
Elec Abs	Electro chromic glass that darkness by becoming more absorptive
Elec Ref	Electro chromic glass that darkness by becoming more reflective
Bleached	Bleached (lightest) state of electro chromic glass
Colored	Colored (darkest) state of electro chromic glass

Table 1: Glazing types used in the simulations

RESULTS AND DISCUSSION

6 stories courtyard performed similar to 3 stories courtyard in terms of total energy consumption trend of the glazing types (Figures 2 and 3). Energy performance of “SglRer-B-H Clr 6mm” and “Sgl Ref-D Clr 6mm” type glazings in Istanbul differed a little when the height of the courtyard changed (Figures 2 and 3). 40% and 60% of window to wall ratio has been found to be optimum in 3 stories courtyard whereas this ratio has been found to be 100% for 6 stories courtyard.

Figure 2: Simulation results for 3 stories courtyard

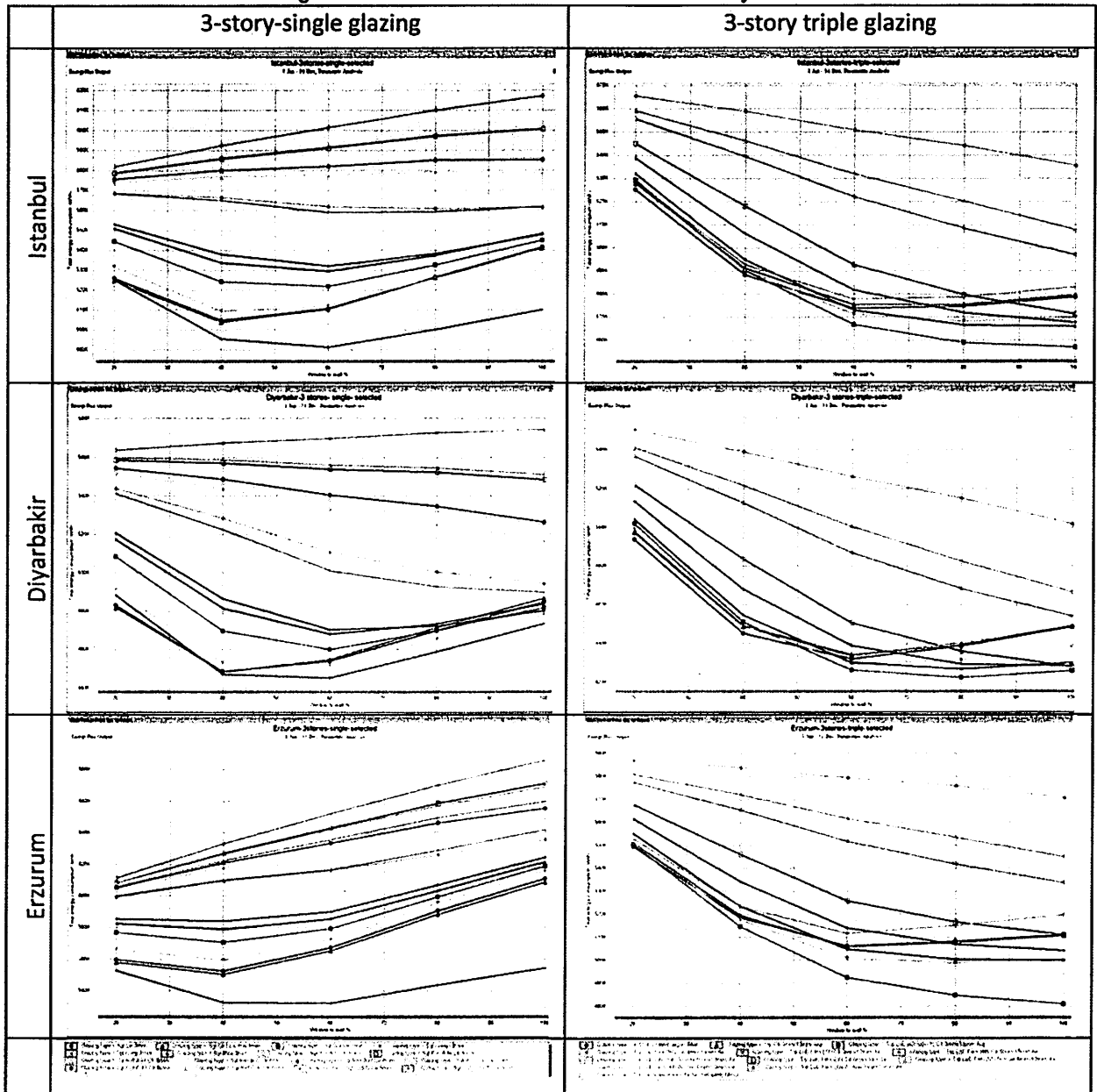
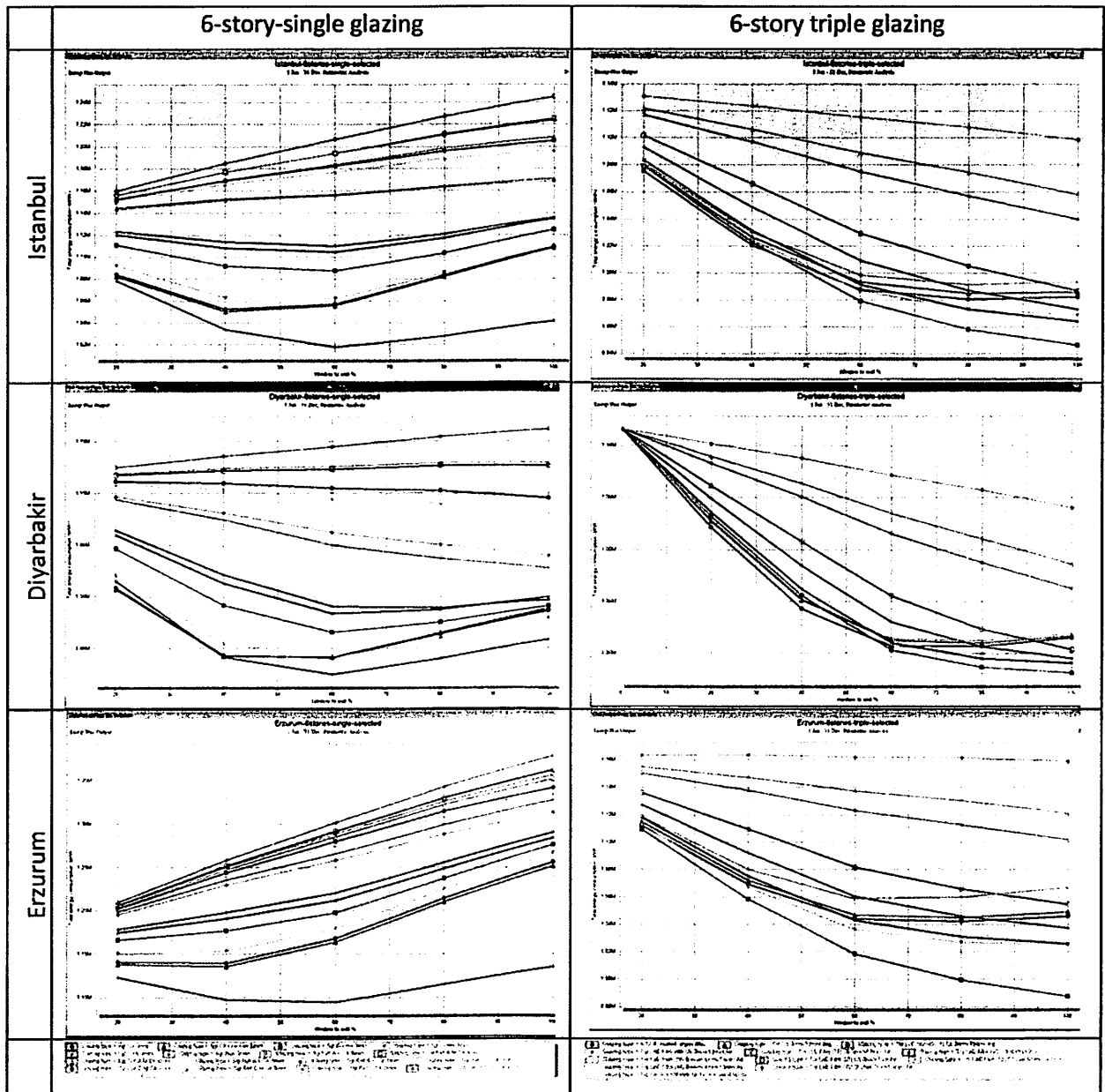


Figure 3: Simulation results for 6 stories courtyard



Different single glazing types' performances have been analysed in different window to wall ratios (Figures 2 and 3). Accordingly, for both courtyards low total energy consumption occurred when "SglLoE (e2=2) Clr 3mm" glazing on 40% ratio has been used in Istanbul as well as in Erzurum. On the other hand, results show that in all climates "Sgl Ref-A-L Clr 6mm" glazing type caused high total energy consumption. It should be mentioned that for glazing types numbered from 9 to 14 in the Table 1, 40% ratio has been found to be optimum from the energy conservation point view in Erzurum. "Sgl Green 3mm", "Sgl Clear 3mm" and "Sgl Low Iron 5mm" glazings provided optimum energy performance in 40% ratio whereas "Sgl Blue 6mm", "Sgl Grey 3mm" and "Sgl Bronze 3mm" in 60% ratio in Istanbul and Diyarbakir.

Usage of "Sgl Ref-B-H Clr 6mm" and "Sgl Ref-D Clr 6mm" glazing types and increasing window to wall ratio decreased the total energy consumption in Istanbul and Diyarbakir whereas increased rapidly in cold climate such as Erzurum (Figures 2 and 3). Increasing window to wall ratio in

glazing types numbered from 1 to 8 in the table 1 increased the energy demand in Diyarbakir and Erzurum (Figures 2 and 3).

Using triple glazing types in courtyard building has lead to different behavior of building energy conservation in comparison with single ones. Increasing window to wall ratio in glazing types numbered from 1 to 4 in the table 1 increased energy performance of the courtyards in all climates. It has been found that "TrpLoE (e2=e5=0.1) Clr 3mm/13mm Arg" requires minimum energy demand when window to wall ratio is 100% in Erzurum and in Istanbul whereas 80% for Diyarbakir. Maximum total energy consumption has been observed when using "TrploE Film (33) Bronze 6mm/13mm Air" glazing type for three cities in all examined window to wall ratio.

CONCLUSION AND RECOMMENDATIONS

There is lack of a comprehensive strategy in terms of courtyards thermal performance under different conditions. Most study studies indicated that the characteristics of courtyards affect the indoor environment conditions and that incorporation of courtyards in buildings could increase the energy efficiency of buildings. There is still a lack of research in predicting the thermal behavior of courtyards like, radiation, air flow patterns, and humidity.

This research aimed to examine thermal performance of material type used on courtyard adjacent space. Following the literature survey, analyses have been carried out on courtyard modeled within the scope of this paper. The simulations have been undertaken using DesignBuilder/Energyplus considering different climates in Turkey and different glazing types as well as different window-wall ratios.

The findings can be summarized as follows:

- Glazing ratio have significant impact on total energy consumption of courtyard building
- Total energy conservation happen in same window to wall ratio of single and triple group of glazing for two type of building (3 and 6 stories courtyard)
- Optimal energy conservation varies in different climates for most of the glazing

The recommendations obtained from this research can be summarized as follows:

- Glazing type should be selected to minimize energy use, occupant comfort and to maximize daylight effectiveness while still meeting architectural objectives.
- The effective aperture target should be used to determine the range of desirable visible transmittances, based on window-to-wall ratio.
- Color, reflectance and UV transmittance influence should be considered in the glazing type selection.
- Sizing windows should be kept within acceptable limits.

REFERENCES

- Al-Sallal K. A. , Al-Rais L., Bin Dalmouk M. (2013) Designing a sustainable house in the desert of Abu Dhabi, Renewable Energy 49 80e84

- Al-Masri N., and Abu-Hijleh B.(2012) Courtyard housing in midrise buildings: An environmental assessment in hot-arid climate, *Renewable and Sustainable Energy Reviews* 16 1892– 1898
- Cai W.G., Wu Y., Zhong Y., Ren H., (2009) China building energy consumption: Situation, challenges and corresponding measures, *Energy Policy*, 37 2054-2059.
- Dili A.S., Naseer M.A., Varghese T. Z. (2010) Passive environment control system of Kerala vernacular residential architecture for a comfortable indoor environment: A qualitative and quantitative analyses, *Energy and Buildings* 4, 917–927
- Edwards B, Sibley M, Hakmi M, Land P. (2006) *Courtyard housing: past, present & future*. Oxon: Taylor & Francis; 2006.
- Feng Y.P., Wu Y., Liu C.B., (2009) Energy-efficiency supervision systems for energy management in large public buildings: Necessary choice for China, *Energy Policy*, 37 2060-2065.
- Givoni B., *Passive and Low Energy Cooling of Buildings*, Van Nostrand Reinhold, New York, 1994, p. 4
- Givoni (1994) conclude that the performance of the courtyards depends greatly on the details of their design.
- Henninger, R.H. and Witte, M.J. *EnergyPlus Testing with ANSI/ASHRAE Standard 140-2001 (BESTEST) EnergyPlus Version 1.1.0.020*, Ernest Orlando Lawrence Berkeley National Laboratory Berkeley, California, for U.S. Department of Energy
- Heras M.R., Jimenez M.J., San Isidro M.J., Zarzalejo L.F., and Perez M. (2005) Energetic analysis of a passive solar design, incorporated in a courtyard after refurbishment, using an innovative cover component based in a sawtooth roof concept, *Solar Energy* 78 85–96
- Luis F.J., and Perez-Garcia M., (2004) Parametric study of solar gains in saw-tooth roofs facing the equator, *Renewable Energy* 29 1223–1241.
- L. Perez-Lombard, J. Ortiz, C.H. Pout, A review on buildings energy consumption information, *Energy and Buildings* 40 (3) (2008) 394–398.
- Muhaisen, A.S., and Gadi, M.B. (2005) Mathematical Model for Calculating the Shaded and Sunlit Areas in a Circular Courtyard Geometry. *Building and Environment* 40 1619–1625
- Muhaisen, A.S., and Gadi M.B. (2006a) Effect of courtyard proportions on solar heat gain and energy requirement in the temperate climate of Rome, *Building and Environment* 41 245–253
- Muhaisen, A.S., and Gadi, M.B. (2006b) Shading performance of polygonal courtyard forms, *Building and Environment* 41 1050–1059
- Muhaisen A.S. (2006) Shading simulation of the courtyard form in different climatic regions, *Building and Environment* 41 1731–1741
- Ryu Y., Kim S., Lee D., (2009) The influence of wind flows on thermal comfort in the Daechung of a traditional Korean house, *Building and Environment* 44 18– 26.
- Sadafi N., Salleh E., Haw L. C, Jaafar Z. (2011) Evaluating thermal effects of internal courtyard in a tropical terrace house by computational simulation, *Energy and Buildings* 43, 887–893
- Steemers K., (2003) Energy and the city: density, buildings and transport, *Energy and Buildings* 35 (1) 3–14.
- Yang X., Li Y., Yang L. (2012) Predicting and understanding temporal 3D exterior surface temperature distribution in an ideal courtyard, *Building and Environment* 57 38-48

UNDERSTANDING THE USAGE PATTERN OF LOCAL FACILITIES IN URBAN NEIGHBOURHOOD TOWARDS CREATING A LIVABLE CITY

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ABSTRACT

Local facilities in residential neighbourhood play an important role towards the social sustainability of the local residents. These local facilities are basic components within a particular neighbourhood that include recreational facilities, health facilities, banks, post offices, educational facilities and other communal facilities. Their provision has a significant impact on enabling, sustaining and enhancing societal living conditions and improving quality of living (Witten et.al., 2003). This denotes the importance of the provision of local facilities to the local residents to create a livable city. In Malaysia, through the development plans, zonings for the local services and facilities provide an important impact on the availability of these services within a neighbourhood. These were also supported by the demand and supply of the services and facilities required by the residents. Issues concerning local facilities in urban neighbourhood often revolve around the quality and catchment area, usage pattern and its accessibility. This paper apparently looks into understanding the usage pattern of the local facilities in several urban neighborhoods within the Federal Territory of Kuala Lumpur and Federal Territory of Putrajaya. Preliminary findings of the study expose local issues and problems related to the access and its usage of facilities within the residential neighborhoods which corresponds to the issues highlighted in the National Urban Policy (NUP) (Federal Department of Town and Country Planning Peninsular Malaysia, 2006). Following this, through a face-to-face household questionnaire survey, the researcher gathers information on the usage pattern in terms of frequency of use, mode of transportation used, perceptions towards quality and satisfaction of the local facilities. The paper concludes with the discussion of the factors that impacts the usage pattern.

Key Words: Local Facilities, Urban Neighbourhood, Livable City, and Urban Form

1.0 INTRODUCTION

The Malaysian Government is consistently committed to improve the quality of life with Malaysia's aspiration towards becoming a developed nation. Priorities are given to ensure high quality of housing, services and a wide range of leisure and cultural facilities (Government of Malaysia, 2010). Also, the government focuses on to ensure that people have access to quality services and people feel safe in their neighbourhood and community. These efforts are part of the initiatives taken to ensure urban areas are more livable. Local facilities in residential neighbourhood play an important role towards the social sustainability of the local residents. They are basic components within a particular neighbourhood that include recreational facilities, health facilities, banks, post offices, educational

facilities and other communal facilities. Their provision has a significant impact on enabling, sustaining and enhancing societal living conditions and improving quality of living (Witten et al., 2003). Access to local services and facilities is an important aspect in neighbourhood design and planning towards better quality living (Barton et al., 2010; Lotfi and Koohsari, 2009). This denotes the importance of the provision of local facilities and services to the local residents to create a livable city. In Malaysia, through the development plans, zonings for the local services and facilities provide an important impact on the availability of these services within a neighbourhood. These were also supported by the demand and supply of the services and facilities required by the residents.

Generally, factors that impact access and use of local services and facilities may be influenced by three broad elements i.e. economic, physical and psychological (Wan Mohd Rani, 2012; Chapman, 1996). In terms of economic, aspects such as income, vehicle ownership, number of household members and number of income provider are the main elements to be considered. Furthermore, being poor and economic disadvantage is the key factor that falls in this category. For physical aspects, shape and pattern of development such as the urban form, layout, and road network can determine the ease of access to services. Local services and facilities that are well connected and are physically accessible either by foot, bicycle or car is the main target of every neighbourhood towards becomes a quality neighbourhood. On the psychological aspect, it relates to the perception of the individuals. It refers to the perceptions of feeling safety and security or fear of danger in certain places. Also, having highly regards or attracted to the area or towards the people/ community of a particular neighbourhood would eventually affect how people behave within the neighbourhood. It is also obvious that when the quality of dwelling or are is bad, it is logical for a person to have a negative perception towards the area. Perceptions and satisfactions will gradually improve as the quality and environment improves (Wan Mohd Rani, 2012; Dekker et. al. 2007). The psychological barriers i.e. fear of crime and safety are important to be eliminated in order to improve the level of livability within a neighborhood.

This paper explores the understanding of the usage pattern of local facilities in several urban neighbourhood. With better understanding of the usage of local facilities and services among urban residents, it will help guide policymakers and planners to further improve the urban areas towards achieving the standard of livable cities as envisioned by the Government of Malaysia.

It was denoted that better access to quality services is one of the indicators of a livable city. There are several factors that would influence the access and use of local services and facilities, socioeconomic status, the physical characteristics which include the urban form elements and level of social interactions with neighbors are among the common factors cited by previous research. The study selected several residential schemes within Federal Territory of Kuala Lumpur and Federal Territory of Putrajaya. Each area has its own unique characteristics which influenced its selection as the case study areas for this study. In brief, the reason for selection was due to the contrast of the two cities, i.e. older and unplanned city (Kuala Lumpur) versus modern planned city (Putrajaya); the experience of rapid growth in both cities and finally, due to the ease for the researcher to facilitate field survey logistically.

2.0 SUMMARY OF METHODOLOGY

This section details out the aspects of methodology undertaken. The methods were formulated to answer the following research questions.

Research Questions

- i. *What are the important factors that impact the usage of local services and facilities in urban neighbourhood?*
- ii. *How do the urban form elements influence the usage pattern of local services and facilities in urban neighbourhoods?*
- iii. *What are the factors that can improve the access and use of local services and facilities in urban neighbourhoods?*

2.1 Data Collection

This study adopted a quantitative method approach. Data were collected through a household questionnaire survey targeted to capture information related to their socioeconomic background, household profile, attitudes towards their neighbourhood and their usage pattern of services and facilities.

In this study, the sample units were the households and a stratified random sampling method was used to select the samples. The sampling frame for the household survey is based on the list of houses located in the case survey area. As mentioned earlier, stratified random sampling was used. The samples were stratified according to the housing density i.e. low density housing medium density, medium high and high density housing and types of dwellings i.e. (i) single detached house, (ii) detached house, (iii) terraced house, and (iv) apartments/flats. Respondents were then selected randomly. The selection was made by selecting every second block of houses. From the selected blocks, every third house was selected. For multiple level residential buildings, every other floor was selected and again, from the selected floor, every 3rd house was selected.

To obtain a wider range of data, the household survey was supported by an observation survey. The observation survey is considered significant for this study since direct contact with the neighbourhood and local people involved in the case studies permits the researcher to obtain information which would have otherwise been unavailable.

2.2 Data Analysis

Data from the questionnaire is analyzed quantitatively and supported by findings derived from the observation survey. To ensure that the samples from the household survey were representative, the researcher performed sample *weighting*. Sample weighting is one of the steps that the researcher has undertaken to ensure that the data are reliable. Generally, in statistics, weighting is used to correct disproportional sample size and used to correct for differential response. By performing weighting, the researcher able to adjust the collected data to represent the population better. In this study, the researcher weighted the samples based on the response rate of the three sub areas (inner, intermediate and outer). Detail of the weight factor is shown in Table II. In performing the analysis, among the techniques applied were, frequency distribution, cross-tabulation and deriving mean score. The researcher further explored the relationship of the data using several statistical tests.

3.0 PROVISION AND USE OF LOCAL SERVICES AND PUBLIC FACILITIES IN URBAN NEIGHBOURHOODS

As mentioned earlier, local services and public facilities are basic components within a particular neighbourhood and include recreational facilities, health facilities, banks, post offices, educational facilities and other communal facilities. Hence, it is very important that the provision of such services and facilities should be available to all citizens regardless of income. The government is the main player in ensuring these basic components are well provided within an area. In Malaysia, through the local planning authority, zonings for the local services and public facilities provide an important impact towards the availability of these services within a neighbourhood. The rest depends on the supply and demand of each service and facilities required by the residents. There are various issues concerning the provision of these local facilities and public facilities especially in developing countries like Malaysia. Most of the time, the issues revolve around quality and catchment area; usage and accessibility.

Using the services and facilities within a residential neighbourhood is considered as one of the generators of physical activity, particularly if it involves walking or cycling. In addition, using local neighbourhood facilities increases the opportunities for spontaneous meeting and the likelihood of social interaction with neighbours and others in the area. Residents who know more of their neighbours and interact more with them can act to deter crime and antisocial behaviour and increase feelings of security. Using local services also increases activity in streets and public spaces and this further reinforces that benefit. Hence, it can be seen that not just access but more particularly the actual use of local facilities should have a positive association with key aspects of social sustainability (health, interaction, safety) towards better livable city.

3.1 Local Services and Facilities in Federal Territory Kuala Lumpur

The Federal Territory of Kuala Lumpur through its local authority, Kuala Lumpur City Hall aims to promote social cohesiveness among its inhabitants. One of the strategies to achieve this is the provision of communal facilities and recreational facilities which could bring people together and further enhance the city living environment. As the planning authority for Kuala Lumpur, Kuala Lumpur City Hall is responsible for ensuring that facilities for the community are distributed in a fair and equitable manner so that all areas and sectors of Kuala Lumpur are equally served according to their requirements.

The research focussed on only several local services and public facilities that the researcher defined as the most commonly used facilities within a neighbourhood. Dempsey et al. (2011) provide a summary of facilities and services that are considered as a necessity in which residents require frequent access. These services and facilities were also being examined in the CityForm Research: doctor/ GP surgery, post office, chemist, supermarket, bank/ building society, corner shop, primary school, restaurant, cafe/takeaway, pub, library, sports/ recreation facility, community center and facility for children (Dempsey et al., 2011). With reference to this list, the type of services and facilities focussed in this research are grouped as follows:

- commercial facilities,
- recreational facilities,
- health facilities,

- religious facilities and
- other key services such as bank, post office.

At present, based on the observation survey conducted by the researcher, the provision of local services and public facilities in the case study areas are in moderate condition. The definition of moderate in this context is that most facilities are facing some issues or problems related to their provision.

The commercial facilities available in the case study areas within Kuala Lumpur are evenly spread. In terms of location and accessibility, a supermarket or convenience store is located in all sub areas within a walking distance of around 5- 15 minutes. The most common issues concerning commercial facilities in the study areas are lack of parking. This is because most of the users are using a personal vehicle, either cars or motorcycle. Based on the researcher's observation, walking was only evident between the vehicle and the shops or between shops. In the inner case study area, as shown in the figure, there is a contrast of two types of retail services: traditional wooden retail area and a new shopping complex that also provide other support services. Residents within the area have a wider selection of retail services. However, in the intermediate and outer areas, it shows that retail services are more localised which is located closer to the residential areas.

Healthcare facilities in the case study areas can be divided into two types; public health facilities and private healthcare facilities. In Malaysia, typically, private healthcare facilities are usually used for visits of common illness, while public healthcare facilities are more common to be used for emergencies and hospital treatments. Based on the observation survey, provisions of private health facilities can be found in most commercial strips within the neighbourhood. In several areas, there is more than one facility. Public healthcare facilities can only be found at certain allocated locations, in standalone building units. Within the case study city of Kuala Lumpur, public health facilities can only be found in the inner sub area. In other areas, only private healthcare facilities are available. The findings from the observation survey correspond well with the actual situation as highlighted in the Kuala Lumpur Structure Plan. Kuala Lumpur City Hall identified that one of the main issues concerning the provision of healthcare facilities is that although there are government clinics such as polyclinics, dental clinics, maternity and children's clinics and hospitals in all areas of Kuala Lumpur, they are not distributed evenly according to the population distribution (Kuala Lumpur City Hall, 2004). This issue affects the lower income groups who are unable to afford treatment at private clinics and who live at a further distance from the public facilities. In terms of access to these facilities, it was observed that most of the residents use private vehicles. Again, like commercial facilities, walking was only made between their vehicles to the facilities. The use of corridors along the rows of shop or facility is very significant to the pedestrian due to the weather factors.

It is generally known that recreational facilities are some of the most important aspects in neighbourhood planning due to their impact on the physical and psychological well-being of the residents as well as serving as elements which reinforce a sense of community. Provision of recreational facilities in Kuala Lumpur is one of the issues faced by its local authority, Kuala Lumpur City Hall (Kuala Lumpur City Hall, 2004). It is noted in Kuala Lumpur Structure Plan that although there are neighbourhood and local parks, children's playgrounds, soccer fields, public swimming pools and tennis courts in all strategic zones, including the areas under study, these facilities are not distributed evenly according to the population distribution (Kuala Lumpur City Hall, 2004). The lack of recreational facilities was identified due to the limited space and high land value within the city. During the observation survey, the researcher has made several visits to recreational facilities around the study areas at different times. Based on the visits, there are quite a number of recreational facilities that are provided but underutilized (Observation Survey, 2010). This situation has arisen due to inadequate maintenance, vandalism and poor accessibility and has particularly affected some children's playgrounds, soccer fields and sports facilities. This is also supported by claims highlighted in the

National Urbanization Policy (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006).

Provision of support services such as banks and post offices in the neighbourhood is essential to ensure local residents have a convenient place to run their errands. In Malaysia it is common to have these types of services at rows of shophouses within the neighbourhood. This scenario also applies in both case study cities. However, it was also observed that when there is a shopping complex within the area, these services are also being provided within that building. It is believed that, in order to provide more convenience to the users, mainly in terms of comfort and ease of carrying out the errands, these services are provided within the shopping building together with other retail tenants. Specifically, in terms of the provision of banks and post offices within the three areas in Kuala Lumpur, it was revealed that there is not much option within the inner areas. It was observed that residents within the inner sub areas would have to travel either to the city centre or to the intermediate areas for better options (Observation Survey, 2010).

3.2 Local Services and Facilities in Federal Territory of Putrajaya

As mentioned earlier subsection, Putrajaya is a planned city built based on a greenfield development. Hence, it is expected to meet all the basic neighbourhood planning principles. Based on the inception report, Putrajaya Corporation, its local authority has reserved approximately 344.27 hectares for the provision of local services and public facilities for its local residents (Putrajaya Corporation, 2009). These provisions include educational facilities, healthcare facilities, religious facilities, safety and security and other facilities (Putrajaya Corporation, 2009). Again, the researcher would like to highlight that the types of services and facilities considered in this research include or are limited to commercial facilities, recreational facilities, healthcare facilities, and other services such as banks, post offices and religious facilities. Based on the observation survey, provision of the services and facilities are inadequate and not well distributed. This may be due to it being a newly planned/ built city. The city is still developing and the population is still growing with new buildings coming up and residential areas developing in and around the area.

Commercial facilities in Putrajaya are divided into 4 levels; (i) Core Commercial Centre; (ii) Semi-commercial centre; (iii) Neighbourhood commercial centre; and (iv) local commercial centre (Putrajaya Corporation, 2009). However, this research focussed only on the last two hierarchies, which is more localised to its residents. Based on the aims and objectives of the Putrajaya Corporation, the provision of commercial facilities within the area not only targeted for the neighbourhood residents but also for the working population that works in Putrajaya and its neighbouring residents (Putrajaya Corporation, 2000 and 2008). This is the main reason majority of the facilities are more centralised.

Similar to Kuala Lumpur City, the healthcare facilities in the area can be divided into two types: public healthcare facilities and private clinics. There is one public hospital in Putrajaya which is located in Precinct 7, an intermediate location that would ensure it is equally accessible to all its residents. Based on the planning guidelines for Putrajaya, the provision of this public hospital is sufficient to cater the need of the current population and also its target population until year 2023. For the public clinics, there have been 5 areas zoned as healthcare. However, currently, only one has been built, located in Precinct 9, the most populated residential precinct at present.

As a newly planned city, Putrajaya can be claimed as one of the successful cities in terms of its provision of recreational facilities. The recreational facilities in Putrajaya have been planned on an integrated approach and based on hierarchies. There are basically 8 levels of recreational facilities i.e.: metropolitan park, urban park, local park, neighbourhood park, playgrounds, green belt, buffer zones and water bodies. The focus of this research is the recreational facilities in the neighbourhood areas such as playground, pocket gardens, football field and other sports recreational. According to its planning guidelines, the catchment for playground is typically every 1000 population.

Provisions of support services in Putrajaya are still quite limited due to the current small size yet growing population. It was observed that most of the support services are still not within walking distance. Another reason for this is its character which is more dispersed than the compact Kuala Lumpur.

3.3 USE OF SERVICES AND LOCAL FACILITIES

Previous research in United Kingdom has shown that use of local services and facilities is often influenced by urban form, in terms of their location in relation to residents which also relates to method of transport used and frequency of usage (Bramley et al in Jenks and Jones, 2010, p. 122). Other research mentioned factors that would impact utilization of public spaces are accessibility, comfort, safety and physical attractiveness (Erkip, 1997 and Pasaogullari and Doratli, 2004, p. 227). Erkip (1997) also stated that certain user characteristics also affect the utilization of public space i.e. demographic background. Location-wise, services and facilities located closer to home are more likely to be reached by foot or bicycle. However, findings from previous research revealed that having services closer to home does not necessarily imply that residents will use those services. It only implies that they have the convenience to just walk or cycle to use those services. Most of the time, people opt for other factors such as the quality of the services rather than convenience (Bramley et al in Jenks and Jones, 2010, p.122). It can also be argued that usage frequency increases with density mainly due to greater accessibility of more central areas. Previous research also revealed two key factors that have significant impact on the use of public space, which are related to perceived safety and maintenance (Bramley et al in Jenks and Jones, 2010, p. 122). Hence, besides modelling the factors that affect the use of services and local facilities, it would also look into testing the hypothesis that the use of services and facilities are related to safety and quality of the services and local facilities. It is also expected that this research would have quite a different finding due to different context in several aspects. Among them are the local weather/climate and the culture of the local people. In the UK walking a relatively short distance is regarded as something normal to access services and facilities. However, this situation cannot be applied to Malaysia, due to the hot tropical climate. It has also been the local culture that, most of the time; Malaysian people would prefer to drive (in an air-conditioned vehicle) as it would give more comfort and less stress. A variation of the result as compared to previous research might occur due to these significant differences. The assessment on the use of selected local services and facilities was attempted to look at whether they use the facilities provided within the neighbourhood.

3.3.1 Economic Factor

The assessment on the relationship between use of services and facilities and economic variables revealed that only certain variables were significantly related. Referring to Table 3.1 in terms of household income level, in Kuala Lumpur, it was revealed that all income groups used the sundry shop within the neighbourhood except for the medium low income group (97%) (significant at 90% confidence level). For Putrajaya, it was noted that healthcare facilities and were used more by the lower income households (93%) as compared to other income groups (significant at 95% confidence level). It was also revealed that recreational facilities i.e. playground and parks were used more by the higher income and middle high income households (91% for playground and 59% for parks). This finding is reported significant at 90% confidence level. With regards to car ownership, overall, the three-way relationship revealed that the use of services within the neighbourhood in Putrajaya is highly dependent on car ownership as it revealed higher use among those that owns at least one car (see Table 3.2). This is different for Kuala Lumpur as several selected facilities (i.e. sundry shops, healthcare facilities, banks, playground, football field and religious facilities) report to have higher usage among those that have no cars. This indicates that Putrajaya's resident is greatly dependent on private vehicles as compared to Kuala Lumpur.

Table 3.1: Cross tabulation between household income level and use of local services and facilities (%)

		Low income group (N=51)	Medium low income group (N=253)	Medium high income group (N=109)	High Income group (N=70)
Kuala Lumpur (N=483)	<i>Commercial Facilities</i>				
	Supermarket	88%	84%	88%	89%
	Sundry Shop *	100%	97%	100%	100%
	<i>Healthcare facilities</i>				
	Private and Public Clinics*	94%	82%	81%	90%
	<i>Recreational facilities</i>				
	Playground	73%	67%	72%	74%
	Football field	47%	40%	49%	34%
	Park/Garden*	25%	19%	17%	25%
	<i>Other Support Services</i>				
	Post office**	82%	74%	66%	83%
	Bank	86%	77%	75%	80%
	Petrol Station	76%	79%	78%	86%
	Religious	96%	93%	93%	94%
		(N=14)	(N=182)	(N=219)	(N=167)
Putrajaya (N=582)	<i>Commercial Facilities</i>				
	Supermarket*	86%	77%	81%	80%
	Sundry Shop	93%	91%	93%	95%
	<i>Healthcare facilities</i>				
	Private and Public Clinics**	93%	77%	88%	87%
	<i>Recreational facilities</i>				
	Playground*	79%	82%	88%	91%
	Football field	36%	44%	52%	36%
	Park/Garden*	50%	54%	60%	59%
	<i>Other Support Services</i>				
	Post office	71%	70%	79%	75%
	Bank	86%	79%	85%	84%
	Petrol Station	86%	90%	94%	95%
	Religious	93%	90%	93%	92%

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

Table 3.2: Cross tabulation between car ownership and use of local services and facilities (%)

		No Car (N=52)	Owns one car (N=236)	Owns two or more cars (N=209)
Kuala Lumpur (N=497)	<i>Commercial Facilities</i>			
	Supermarket	84.6%	85.2%	87.6%
	Sundry Shop	100.0%	99.2%	97.6%
	<i>Healthcare facilities</i>			
	Private and Public Clinics	88.5%	83.1%	84.7%
	<i>Recreational facilities</i>			
	Playground*	78.8%	67.8%	67.5%
	Football field	50.0%	43.2%	35.9%
	Park/Garden	17.3%	20.3%	16.3%
	<i>Other Support Services</i>			
	Post office	78.8%	70.8%	78.0%

	Bank	84.6%	75.0%	79.9%
	Petrol Station*	69.2%	78.4%	83.3%
	Religious	94.2%	92.4%	93.3%
		(N=17)	(N=194)	(N=376)
	<i>Commercial Facilities</i>			
	Supermarket	70.6%	80.4%	79.8%
	Sundry Shop	88.2%	91.8%	93.4%
	<i>Healthcare facilities</i>			
	Private and Public Clinics**	58.8%	82.0%	86.7%
	<i>Recreational facilities</i>			
Putrajaya (N=587)	Playground**	64.7%	83.0%	88.8%
	Football field	70.6%	55.2%	50.0%
	Park/Garden*	35.3%	57.2%	59.0%
	<i>Other Support Services</i>			
	Post office**	41.2%	73.2%	76.9%
	Bank	76.5%	79.4%	85.1%
	Petrol Station***	47.1%	92.8%	94.7%
	Religious ***	64.7%	91.2%	92.8%

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

Table 3.3 looks at the relationship between home ownership and use of local services and facilities. The pattern of the relationship revealed mixed findings. It was noted that none of the use of services and facilities are significantly related to home ownership in Putrajaya. This may be due to the high renting households in Putrajaya.

Table 3.3: Cross tabulation between home ownership and use of local services and facilities (%)

		Own with mortgage (N=144)	Own outright (N=163)	Renting (N=190)
Kuala Lumpur (N=497)	<i>Commercial Facilities</i>			
	Supermarket	81.9%	90.2%	85.8%
	Sundry Shop	99.3%	97.5%	98.9%
	<i>Healthcare facilities</i>			
	Private and Public Clinics***	91.0%	91.4%	73.2%
	<i>Recreational facilities</i>			
	Playground	68.8%	70.6%	67.4%
	Football field*	48.6%	38.0%	37.4%
	Park/Garden	19.4%	16.0%	19.5%
	<i>Other Support Services</i>			
	Post office***	77.8%	81.6%	66.3%
	Bank	75.7%	81.0%	77.4%
Petrol Station**	75.0%	86.5%	76.8%	
Religious	94.4%	92.0%	92.6%	
		(N=30)	(N=15)	(N=542)
Putrajaya (N=587)	<i>Commercial Facilities</i>			
	Supermarket	90.0%	86.7%	79.0%
	Sundry Shop	93.3%	86.7%	92.8%
	<i>Healthcare facilities</i>			
	Private and Public Clinics	86.7%	66.7%	84.7%
	<i>Recreational facilities</i>			

Playground	80.0%	93.3%	86.3%
Football field	50.0%	53.3%	47.4%
Park/Garden	70.0%	66.7%	56.8%
<i>Other Support Services</i>			
Post office	76.7%	66.7%	74.7%
Bank	90.0%	80.0%	82.7%
Petrol Station	90.0%	80.0%	93.2%
Religious	86.7%	100.0%	91.5%

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

3.3.2 Physical Factors

Analysis of the relationship between the usage and physical factors or urban form variable revealed some interesting findings. Based on the result of the bivariate analysis, it revealed some mixed findings. However, for housing type, it is noted that in both case study cities, playgrounds were used more by households of detached/ semi-detached with 90.3% in Kuala Lumpur and 90.2% (significance level of 95% in Kuala Lumpur and 99% in Putrajaya). On the other hand, in relation to density, as low density only reports a marginal response, only medium and high density is considered for interpretation. Overall, medium density shows a higher percentage of respondents using the services and facilities in both cities except for sundry shop; religious facilities and banks in Putrajaya and sundry shop in Kuala Lumpur (see Table 3.5). Table 3.6 shows the bivariate relationship between use of local facilities and services and land use (single residential use and some land use mix). For commercial facilities, as expected, households within areas of some land use mix shows higher use as compared to households within single residential use areas. Recreational facilities use is greater within single residential use areas (significant at 95% and 99% confidence level). These findings correspond well with previous research that noted some mix of land use have better usage of services and facilities particularly the retail services. Table 3.7 shows relationship between layout types and use of local facilities and services. The findings indicate that respondents with dwellings within courtyard-type of layouts have higher use of recreational facilities. Subsequently, supermarket facilities were used more by respondents with dwelling within both linear and superblock layout.

Table 3.4: Three way relationship between case study cities, housing type and use of local facilities and services (%)

		Detached/ Semi-detached (N=31)	Terraced (N=165)	Flat/ Apartment (N=298)
Kuala Lumpur (N=497)	<i>Commercial Facilities</i>			
	Supermarket	93.5%	87.9%	84.6%
	Sundry Shop	100.0%	98.2%	98.7%
	<i>Healthcare facilities</i>			
	Private and Public Clinics***	100.0%	91.5%	79.2%
	<i>Recreational facilities</i>			
	Playground**	90.3%	71.5%	65.4%
	Football field	45.2%	41.2%	40.6%
	Park/Garden	32.3%	18.8%	16.8%
	<i>Other Support Services</i>			
	Post office***	96.8%	87.9%	65.4%
	Bank***	90.3%	87.9%	71.8%
	Petrol Station***	87.1%	90.9%	72.1%

<i>Putrajaya</i> (N=587)	Religious	96.8% (N=51)	92.1% (N=324)	93.3% (N=210)
	<i>Commercial Facilities</i>			
	Supermarket	74.5%	80.9%	79.5%
	Sundry Shop	88.2%	92.3%	94.3%
	<i>Healthcare facilities</i>			
	Private and Public Clinics**	84.3%	88.3%	78.1%
	<i>Recreational facilities</i>			
	Playground***	90.2%	90.1%	79.0%
	Football field*	49.0%	51.5%	41.9%
	Park/Garden	56.9%	61.1%	52.9%
	<i>Other Support Services</i>			
	Post office	72.5%	75.3%	73.8%
	Bank	86.3%	81.8%	84.3%
	Petrol Station	92.2%	94.1%	90.5%
	Religious	92.2%	91.0%	92.4%

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

Table 3.5: Relationship between case study cities, density and use of local facilities and services

		Low density (N=7)	Medium density (N=201)	High density (N=289)
<i>Kuala Lumpur</i> (N=497)	<i>Commercial Facilities</i>			
	Supermarket	100.0%	87.6%	84.8%
	Sundry Shop	100.0%	98.5%	98.6%
	<i>Healthcare facilities</i>			
	Private and Public Clinics***	100.0%	91.5%	78.9%
	<i>Recreational facilities</i>			
	Playground**	71.4%	75.1%	64.4%
	Football field*	42.9%	41.3%	40.5%
	Park/Garden	28.6%	21.4%	15.9%
	<i>Other Support Services</i>			
	Post office***	100.0%	87.6%	65.1%
	Bank***	100.0%	86.6%	71.6%
	Petrol Station***	100.0%	88.6%	72.7%
	Religious	85.7%	93.5%	92.7%
			(N=51)	(N=324)
<i>Putrajaya</i> (N=587)	<i>Commercial Facilities</i>			
	Supermarket	74.5%	80.9%	79.2%
	Sundry Shop	88.2%	92.3%	94.3%
	<i>Healthcare facilities</i>			
	Private and Public Clinics**	84.3%	88.3%	78.3%
	<i>Recreational facilities</i>			
	Playground***	90.2%	90.1%	79.2%
	Football field*	49.0%	51.5%	41.5%
	Park/Garden	56.9%	61.1%	52.8%
	<i>Other Support Services</i>			
	Post office	72.5%	75.3%	74.1%
	Bank	86.3%	81.8%	84.0%

Petrol Station	92.2%	94.1%	90.6%
Religious	92.2%	91.0%	92.0%

**indicates statistically significant at 10% level*
*** Statistically significant at 5% level*
****Statistically significant at 1% level*

Table 3.6: Relationship between land use and use of local facilities and services

	Single land use residential (n=696)	Some land use mix (n=388)
<i>Commercial Facilities</i>		
Supermarket	81.5%	84.8%
Sundry Shop**	93.8%	98.2%
<i>Healthcare facilities</i>		
Private and Public Clinics	85.1%	83.0%
<i>Recreational facilities</i>		
Playground***	83.5%	68.8%
Football field**	47.6%	39.2%
Park/Garden***	51.7%	18.0%
<i>Other Support Services</i>		
Post office	76.1%	71.9%
Bank**	83.5%	75.8%
Petrol Station***	91.7%	77.6%
Religious*	91.1%	94.1%

**indicates statistically significant at 10% level*
*** Statistically significant at 5% level*
****Statistically significant at 1% level*

Table 3.7: Relationship between layout types and use of local facilities and services

	Superblock (n=511)	Linear block (n=494)	Cul-de-sacs (n=25)	Courtyard (n=52)
<i>Commercial Facilities</i>				
Supermarket	82.6%	84.2%	72.0%	75.0%
Sundry Shop**	96.9%	94.7%	92.0%	88.5%
<i>Healthcare facilities</i>				
Private and Public Clinics	78.5%	91.1%	68.0%	84.6%
<i>Recreational facilities</i>				
Playground***	70.8%	85.0%	68.0%	90.4%
Football field	41.1%	47.8%	40.0%	51.9%
Park/Garden	31.7%	45.1%	56.0%	57.7%
<i>Other Support Services</i>				
Post office ***	68.7%	81.8%	56.0%	73.1%

Bank**	76.7%	85.2%	64.0%	86.5%
Petrol Station***	79.6%	93.3%	84.0%	92.3%
Religious**	92.8%	92.5%	76.0%	92.3%

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

3.3.3 Psychological Factors

Based on previous research and as discussed in earlier subsections, psychological factors were also claimed to have influence on the use of the services and facilities (Evans, 2009; Chapman, 1996). As shown in Table 3.8, satisfaction towards community and neighbourhood was found positively impact the use of majority of the facilities and services except for petrol station. This finding also applies to social interaction, as higher levels of social interaction positively impact the use of majority of facilities and services except for sundry shop (see Table 3.9). Also, as expected, feeling safe also give a positive impact to the behaviour of the residents within a residential neighbourhood. In this study, results shown that it has improved the use of services and facilities except for the post office (see Table 3.10). This corresponds with previous findings that suggest similar patterns. Findings from the CityForm research suggested that respondents were less likely to use facilities, i.e. parks, if they felt unsafe (Bramley et al. in Jenks and Jones, 2010).

Table 3.8: Satisfaction towards community and use of selected facilities and services

	Use	Does not use	Levene's Test (sig.)	t-test (sig.)
<i>Commercial Facilities</i>				
Supermarket	2.81	2.76	0.03**	0.21
Sundry Shop	2.81	2.69	0.00***	0.10
<i>Healthcare facilities</i>				
Private and Public Clinics	2.82	2.69	0.00***	0.00***
<i>Recreational facilities</i>				
Playground	2.81	2.75	0.00***	0.10
Football field	2.83	2.77	0.00***	0.04**
Park/Garden	2.81	2.80	0.27	0.70
<i>Other Support Services</i>				
Post office	2.80	2.80	0.87	0.86
Bank	2.81	2.76	0.03**	0.17

Petrol Station	2.80	2.81	0.49	0.77
Religious	2.80	2.78	0.49	0.67

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

Table 3.9: Level of social interaction and perceived use of selected facilities and services

	Use	Does Not Use	Levene's Test (sig.)	t-test (sig.)
<i>Commercial Facilities</i>				
Supermarket	2.63	2.43	0.64	0.01
Sundry Shop	2.58	2.66	0.19	0.57
<i>Healthcare facilities</i>				
Private and Public Clinics	2.63	2.33	0.04**	0.00***
<i>Recreational facilities</i>				
Playground	2.60	2.54	0.02**	0.43
Football field	2.66	2.52	0.17	0.02**
Park/Garden	2.64	2.55	0.00***	0.14
<i>Other Support Services</i>				
Post office	2.64	2.41	0.48	0.00***
Bank	2.61	2.47	0.66	0.05**
Petrol Station (n=739)	2.60	2.50	0.09*	0.26
Religious (n=941)	2.60	2.39	0.01**	0.06*

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

Table 3.10: Feeling safe and use of selected facilities and services

	Use	Does Not Use	Levene's Test (sig.)	t-test (sig.)
<i>Commercial Facilities</i>				
Supermarket	2.72	2.66	0.23	0.27
Sundry Shop	2.72	2.56	0.01**	0.11
<i>Healthcare facilities</i>				
Private and Public Clinics	2.72	2.64	0.15	0.18
<i>Recreational facilities</i>				
Playground	2.73	2.62	0.00***	0.03**
Football field	2.76	2.67	0.00***	0.04

Park/Garden	2.77	2.67	0.00***	0.02**
<i>Other Support Services</i>				
Post office	2.70	2.74	0.04**	0.43
Bank	2.72	2.66	0.23	0.24
Petrol Station	2.71	2.69	0.79	0.71
Religious	2.72	2.59	0.01**	0.08*

*indicates statistically significant at 10% level

** Statistically significant at 5% level

***Statistically significant at 1% level

4. SUMMARY AND CONCLUSION

This paper has explored the various factors that influence the usage pattern of selected facilities. Prior to interpret the findings of the analysis, it is important to note the different character of each service and facilities. Each of the selected local services and public facilities has their own expectations of the usage pattern. It is also important to note that low usage of the selected services and facilities also implies that they use such services outside the neighborhood. The findings obtained with regard to the usage of the services and facilities were only on a perceptual or self-reported basis. Respondents were required to respond to questions in the questionnaire that corresponded to whether they have access to the services and facilities within their neighbourhood. On the usage pattern, it was a self-reported usage. The respondents were given full responsibility to report their usage pattern.

Essentially the research provides understanding of some aspects of social sustainability in the residential neighborhood level. As the key findings revealed, the aspect of safety was suggested the most influential factor towards the overall use of services and facilities. In terms of physical elements, the relationship between density and use were rather mixed. It was reported high density contributes to higher usage of the selected facilities such as sundry shops. This finding also supports other previous studies such as Burton (2000a, 2000b, 2003); and Bramley et al. (2009). Given the fact of the different characteristics of the two case study cities, differences in the findings are marginal. It was revealed that the findings and differences in terms of the urban form elements at a neighborhood level were more relevant rather than of the two case study cities. Overall, key findings of this study have provided mixed findings on the factors that are able to improve access and overall use of local services and public facilities. However, psychological aspects contribute significantly, with aspect of safety and neighbourhood satisfaction has influence the overall usage. Finally, it is hoped that with this indication, policy makers and planner able to make vital decisions to further improve access and improve the usage of local services and facilities in residential neighbourhood.

REFERENCES

- Barton, H., Guise, R., & Grant, M. (2010). *Shaping neighbourhoods: for local health and global sustainability*. Routledge.
- Bramley et. Al. in Jenks, M., Jones, C., Dempsey, N., Brown, C., Raman, S., Porta, S., et al. (2010). Elements of Urban Form. in *Dimensions of the Sustainable City* (Vol. 2, pp. 21-51): Springer Netherlands.

- Burton, E. (2000a). The potential of the compact city for promoting social equity, in *Achieving Sustainable Urban Form* (eds K. Williams, E. Burton and M. Jenks), E & FN Spon, London.
- Burton, E. (2000b). The compact city: just or just compact? A preliminary analysis. *Urban Studies*, 37(11): pp.1969-2006.
- Burton, E., (2003). Housing for an Urban Renaissance: Implications for Social Equity. *Housing Studies*, 18(4), p.537-562.
- Burton, E. et al., (2005). Measuring physical characteristics of housing: the Built Environment Site Survey Checklist (BESSC). *Environment and Planning B: Planning and Design*, 32(2), pp.265 – 280.
- Chapman D. (1996) *Creating neighbourhoods and places in the built environment*, E & FN Spon.
- Dekker, K., Musterd, S. and Kempen R. (2007). *Explaining differentials in housing and neighbourhood satisfaction in post-WWII large housing estates in European cities*. International Conference of the European Network for Housing Research on “Sustainable Urban Areas”, Rotterdam, The Netherlands, 25-28th June 2007.
- Dempsey, N., Bramley G., Power S. and Brown C. (2011). The social dimension of sustainable development: Defining urban social sustainability. *Sustainable Development*, 19(5), pp.289-300.
- Erkip (Belcer) F, 1997, The distribution of urban public services: the case of parks and recreational services in Ankara" *Cities*, 14 353 -361
- Evans, G., (2009). Accessibility, Urban Design and the Whole Journey Environment. *Built Environment*, 35(3), pp.366-385.
- Jenks, M., Jones, C., Dempsey, N., Brown, C., Raman, S., Porta, S., et al. (2010). Elements of Urban Form. in *Dimensions of the Sustainable City* (Vol. 2, pp. 21-51): Springer Netherlands.
- Jenks, M., Burton, E. and Williams, K. (eds) (1996) *The Compact City: A Sustainable Urban Form?* E & FN Spon, an imprint of Chapman and Hall, London.
- Jones, C., (2009). *Dimensions of the Sustainable City*, Springer.
- Kuala Lumpur City Hall. (2004) Kuala Lumpur Structure Plan 2020.
- Kuala Lumpur City Hall. (2008) Local Plan, Kuala Lumpur 2020 City Plan.
- Lotfi, S., & Koohsari, M. J. (2009). Measuring objective accessibility to neighborhood facilities in the city (A case study: Zone 6 in Tehran, Iran). *Cities*, 26(3), pp. 133-140.
- Pasaogullari N, Doratli N (2004) "Measuring accessibility and utilization of public spaces in Famagusta" *Cities*, 21(3), 225–232.
- Putrajaya Corporation. (1995). *Putrajaya Masterplan*.
- Putrajaya Corporation. (1997). *Putrajaya review of the master plan* (March).
- Putrajaya Corporation. (2009). Laporan Pemeriksaan, Draf Rancangan Struktur Putrajaya, (*Technical Report, Draft Structure Plan Putrajaya*), June, 2009.
- Putrajaya Corporation. (2002a). Local Plan of Putrajaya Precincts 1 & 13
- Putrajaya Corporation. (2002b). Local Plan of Putrajaya Precincts 7, 8, 9 & 10
- Putrajaya Corporation. (2002c). Local Plan of Putrajaya Precinct 11
- Putrajaya Corporation. (2001). Manual of Physical Planning Guidelines for Putrajaya Local Plan Precinct 7, 8, 9 & 10.
- Government of Malaysia, 2010. Tenth Malaysia Plan 2011-2015.
- Witten, K, Exeter, D and Field, A (2003). The quality of urban environments: mapping variation in access to community resources. *Urban Studies* 40(1), pp.161–177

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