

Jurnal TEKNIK SIPIL

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Haryanto Yoso Wigroho

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Mamok Suprpto

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Studi Kuat Tekan Kolom Baja
Profil C Ganda
Dengan Pengaku Pelat Arah Lateral

Analisa Kekuatan Tarik Besi Beton
Struktur Beton Jembatan Waihattu
(Perhitungan Manual-Minitab.13)

Kajian *Reuse* Material Bangunan
Dalam Konsep *Sustainable Construction*
Di Indonesia

Estimasi Matrik Informasi Lalu Lintas
Model *Gravity* Asal Tujuan Angkutan
Pribadi-Umum

Keamanan Utilitas Tiang Jalan Raya

Manajemen Pemeliharaan Pusat Belanja
(studi Kasus Cihampelas *Walk* Bandung)

Konstruksi Pondasi Sarang Laba-laba
Atas Tanah Daya Dukung Rendah
Bangunan Bertingkat Tanggung

Konsep Pengelolaan Sumber Daya Air
Berkelanjutan

*Watershed Hydrological Analysis
Of Jakarta Extreme Floods*

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upstream Ciliwung basin was much while it was less rainfall around the Jakarta area of

lower Ciliwung basin. In contrary, on 10-11 February, it occurred oppositely.

Similar to the 1996 flood event, in 2002 the flood occurred on 26-27 January and 11-14 February. The Netherlands Engineering Consultants (NEDECO, 2002) justified that the fundamental difference with the 1996 flood was that both the peak flows from upstream and the local heavy precipitations occurred simultaneously in a couple of days. This time the water level passed through Manggarai gate was 400 m³/s which was lower than the one in 1996, i.e. 500 m³/s. In 1996, the flood return period was 50 years and it was 20 years in 2002. The rainfall was similar to the one in 1996, which the maximum point rainfall also occurred in Bekasi, i.e. 250 mm and its return period was approximately 100 years but this time it occurred for ten consecutive days. At the beginning of the second flood, the springtide also happened simultaneously but immediately lost its peak.

Hence, it had nothing to do when the peak occurred in 4 February. The top flow in Katulampa, the upstream of the Ciliwung River, did not have anything to do with the flood peak as well, since it took place one week earlier than the flood peak time. Furthermore, the Ciliwung top flow on 4 February must have been caused by the intense rains in the middle reach of the catchment area, i.e. along Depok to Manggarai. On the other hand, the rainfall analysis concluded that February 2002 daily rains may have a return period of approximately five years only, whereas the river peak flows had a return period of approximately 20 years.

Assessing those return period values, the study claimed that a 20-years flood normally must not have caused any large-scale urban inundation as the one experienced during the other floods.

Although the magnitude of the flood in 2002 was lower than the one in 1996, the inundated area was much larger than the one 1996. It was more than two times since approximately 4,000 ha was inundated in 1996 and 10,000 ha in 2002. The details of both flood events are presented in Table 3.

CONCLUSIONS

Hydrologically, the extreme floods in Jakarta occurred mainly due to heavy rainfalls in the downstream area. The river flooding represented by high discharge recorded in the middle to upstream reach of Ciliwung contributed to worsen the condition. However, the severity of flood impact in terms of inundated area, number of victims and loss was also resulted from the complexity of various factors other than just hydrologic variables, such as location of residential and commercial areas. Therefore, the solution to overcome the problem of flooding in Jakarta requires not only technical measures. In fact, it should be an integrated watershed management that also covers the non-technical aspects, such as social and politics

REFERENCES

- ACF (Action Contre la Faim), 2004, *Profile of Kampung Melayu*, Jakarta.
- BPS (Biro Pusat Statistik) Propinsi DKI Jakarta, 2002, *Jakarta Dalam Angka 2002*, Jakarta.
- JICA, 1997, Directorate General of Water Resources Development, Ministry of Public Works, the Republic of Indonesia, *The Study on Comprehensive River Water Management Plan in Jabotabek*. Final Report, Volume III, Main Report-Feasibility Study, Jakarta.
- JICA, 1997, Directorate General of Water Resources Development, Ministry of Public Works, the Republic of Indonesia, *The Study on Comprehensive River Water Management Plan in Jabotabek*, Final Report, Volume III, Main Report-Master Plan, Jakarta.
- JICA, 1997, Directorate General of Water Resources Development, Ministry of Public Works, the Republic of Indonesia, *The Study on Comprehensive River Water Management Plan in Jabotabek*, Final Report, Volume IV, Annexes I, Jakarta.
- NEDECO, 2002, Ministry of Transport, Public Works and Water Management of the Kingdom of the Netherlands, Departemen Permukiman dan Prasarana Wilayah, Pemerintah DKI Jakarta, *Final Report Quick Reconnaissance Study, Flood Jabodetabek 2002*, Main Report, Jakarta.

NEDECO, 2002, Ministry of Transport, Public Works and Water Management of the Kingdom of the Netherlands, Departemen Permukiman dan Prasarana Wilayah, Pemerintah DKI Jakarta, *Final Report Quick Reconnaissance Study, Flood*

Jabodetabek 2002, Appendix Report, Jakarta.

Yunika, A., 2005, *Public Health Impact of Urban Flooding: A Case Study of Jakarta, Indonesia*, Master Thesis, Thailand.

