CHAPTER I

INTRODUCTION

1.1. Background

In this modern era airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. Every airport has different specification depend on the aircraft needed in the area.

North Moluccas Province is the land area that surrounded by the active volcanic mountain. This province has airport that divided in several regency. There are seven airports in the province, with just one airport can support the aircraft for Boeing class 737-500 and Boeing 737-800 which is Sultan Babullah airport in Ternate and rest of it just support the ATR 72-600 series. Sultan Babullah airport in Ternate often has disruption by the volcanic eruption, and because it is located in the middle of the small island the airport area cannot be expended. The alternative solution is to build the airport with the same capacity at another regency. Kuabang airport located at Kao, Halmahera Utara regency can be the alternative airport for North Moluccas Province. (*nasional.republika.co.id*, 2017). The airport strategically is located at the main island so can be reached more easily by other regency and has more land area to be expanded is the purpose to support the transportation in the North Moluccas Province.

Otherwise the facilities for the airport are not qualified for the aircraft types Boeing 737. However, there need to be analysis and design the airport based on the

international code for airport design are International Civil Aviation Organization (ICAO) and Federal Aviation Administration (FAA). By considering the international code to design the standard airport as the guidance to the Kuabang airport for designing the for *runway*, *taxiway*, and *apron*. With the expanded the Kuabang airport hope that can be the alternative airport during the volcanic eruption.

1.2 Problem Statement

The volcanic eruption and another natural disaster that often occur in Ternate city affect the transportation mode in that area including airports around it. Thus, to solve this problem, the alternative airport needs to be expanded due to the lack of availability of the Kuabang Kao Airport to support larger aircraft such as Boeing types.

The problems that will be discussed are on the following problem statement:

1. How to design the geometry for *runway*, *taxiway*, and *apron* based on the old airport condition whether can be continue expanded or must be totally redesign.
2. How to implement the ICAO Annex 14 and FAA AC 150/5300-13 codes to the design.

1.3 Problem Limitation

In order to make this research focusing in analysis the geometry for *runway*, *taxiway*, and *apron* as the main problem, author set several limitations:

1. the analysis limitation just for Kuabang Kao airport, Halmahera Utara regency, Maluku Utara province.
2. The analysis standard using ICAO Annex 14 and FAA AC 150/5300-13 code.
3. There are secondary data using in this research that obtained from Directorat Jendral Perhubungan Udara and BMKG Maluku Utara.

1.4 Research Objective

The purpose from this research for design geometry runway, taxiway, and apron is to:

To design the geometry for Runway, Taxiway, and Apron for Kuabang airport for aircraft in boeing type 737-800 is compatible with ICAO Annex 14 and FAA AC 150/5300-13 code.

1.5 Benefits of the Research

The benefits from this research by analysis the geometry for *runway*, *taxiway*, and *apron* for Kuabang Kao airport, Halmahera Utara as follows:

1. Giving the idea to design the new airport by using ICAO Annex 14 and FAA AC 150/5300-13 code.
2. To determine the conditions of the for *runway, taxiway,* and *apron* based on the aircraft needed for Kuabang Kao airport, Halmahera Utara.
3. As an alternative airport for North Moluccas Province during the volcanic eruption.

1.6 Originality

Based on the information there are several proposal titles that discussing in the geometry for *runway, taxiway,* and *apron* airport there are:

1. Sabakodi (2017), Evaluasi Kebutuhan Landasan Pacu runway, taxiway, dan apron Berdasarkan Peningkatan Jumlah Penumpang dan Barang Pada Bandar Udara Umbu Mehang Kunda di Kabupaten Sumba Timur, NTT. In Atma Jaya University.
2. Wuwur (2014), Perancangan Geometri Runway Bandar Udara Wunopito Lewoleba, Lembata Nusa Tenggara Timur. In Atma Jaya University.
3. Lorentinus (2011), Pengembangan Terminal Dan Runway Bandar Udara InternasionaL Tjilik Riwut Di Palangkaraya. In Atma Jaya University.
4. Nugraha (2016). Analisis Geometri Runway, Taxiway dan Apron Bagian Utara Bandar Udara Internasional Soekarno-Hatta Tangerang Banten, Tugas Akhir, Jurusan Teknik Sipil dan Lingkungan, Fakultas Teknik, Universitas Gadjah Mada, Yogyakarta.

In this research there are several differences to another research there are for research location, location condition, and the types of the aircraft that used in the analysis process. The airport location this research is at Kuabang Kao airport, Halmahera Utara, and the condition of the airport is still in the small capacity for ATR 72-600, and not yet be expended for Boeing capacity. The biggest aircraft that used in the analysis is the Boeing types 737-500. And the research for analysis

geometry for *runway*, *taxiway*, and *apron* Kuabang Kao airport, Halmahera Utara is never be done before.