SUMMARY

CLIMATE-GEOLOGICAL FRAMEWORK OF INDONESIAN REGION AND LANDSLIDE PRONE AREAS

Dr. Emi Sukiyah
Faculty of Geology, University of Padjadjaran, Bandung - Indonesia

INTRODUCTION

Indonesia has strategic position. It lied in tropic region, between Asian-Australian continents, also between Pacific-Hindia oceans. This country consists of thousands of islands; lie alongside from west to east. Many straits and gulfs found in here. So, Indonesian region is vulnerable toward climate change.

In Indonesian region, the climate is influenced by global and regional phenomena (BMKG, 2009). The global phenomena are El Nino, La Nina, Dipole Mode (DM), and Madden Julian Oscillation (MJO). Whereas regional phenomena namely circulation of Asia-Australia monsoon, Inter Tropical Convergence Zone (ITCZ*)* as area of cloud growth, and sea-front temperature in Indonesian surrounding.

The topography of Indonesian land which mountainous, valleys, and many coasts, constitute local phenomena that enhance various climate, according spatial as well as time. The result of data analysis during 30 years (1971-2000), there are 293 climate patterns in Indonesian. The 220 patterns as season zone, which own sharp differentiation between period of wet season and dry season (monsoon pattern), whereas another are not season zone. The not season zone area has two times of rain peak in a year (equatorial pattern). In this case, rainfall intensity is high or low along year with wet and dry season duration reverse of season zone area (local pattern).

CLIMATE

El Nino is interaction system of atmosfere that indicated by increasing of sea-front temperature in equatorial mid Pacific or positive anomaly of sea-front temperature. El Nino ascendency in Indonesian region will dependent to its waterworks condition. El Nino phenomena that followed by decreasing of rainfall intensity occur if cold temperature in Indonesian waterworks. Neverthelles, if waterworks temperature is warm, their effect not signficant. La Nina is the opposite of El Nino. It is characterized by negative temperature anomaly of sea-front in equatorial mid Pacific. Generally, La Nina phenomena cause rainfall intensity increase if followed by warm temperature of sea-front in waterworks. In the same manner as El Nino, the La Nina impact not occur for whole Indonesian region too. Dipole Mode is phenomena of sea-atmosfere interaction in Hindia ocean. It is calculated by value difference between temperature anomaly of sea-front in waterworks of Africa east coast and western part of Sumatera. That value difference namely Dipole Mode Index (DMI). Generally, if positive DMI cause decreasing rainfall intensity in western part of Indonesian region, otherwise it cause increasing rainfall intensity. MJO indicate oscillation of clouds growth activity in line along from east Africa waterworks to western part of Pacific. Oscillation period about 30 to 50 days (intra seasonal). Thus, MJO analysis in arrangement of wet season prediction in 2009/2010 only used as matter consideration, especially for prediction of early wet sesason 2009/2010.

Monsoon circulation in Indonesian region decided by difference pattern of air pressure in Australian and Asian regions. They follow solar rotation pattern in a year. That phenomena cause monsoon circulation in Indonesian region. Monsoon pattern is monsoon circulation that its direction change every half a year. Western monsoon pattern caused by high presurre in Asian region be related to wet season in Indonesia. The eastern or south-east monsoon pattern caused by air pressure in Australian region be related to dray season in Indonesian region. ITCZ is zone of low air pressure; lie alongside from west to east with its mobile position follow to solar movement in north-south directions of equator. Generally, the areas which passed by ITCZ own potency of rain cloud growth. The sea-front temperature in indonesian waterworks can be used as one of the indicators other for vapour contain prediction in atmosfere, and strong related with cloud formation process above Indonesian region.

GEOLOGICAL FRAMEWORK

Indonesian archipelago consists of about 1,300 islands; lie alongside 5,200 km. The region mostly site in Cenozoic volcano-plutonic arc. History record shows there are 15% of volcanoes are active. The arc length is about 9,000 km. Geological framework of Indonesian region is complex. There are three active tectonic plates converge, i.e. Eurasia, Indo-Australia, and Pacific. The complicated is showed by lithology and geological structure arrangement.