

3. REGIONAL EXPERIMENTS–PROCESS STUDIES

3.1 Objectives and Concept of GAME Regional Experiments

(1) Objectives

Regional experiments in GAME have several objectives. First of all, it is to understand the interaction processes between atmosphere and land surface under various climate zones in Eurasian Continent related to Asian monsoon formation. Each experiment includes observations on various scale from points to large basin through 100 km grid. The observed data set is to be used not only for the validation to the development of meso-scale atmospheric models, macro-scale hydrological models and those coupled models, but also for the input-data to 4-dimensional data assimilation. At the same time, each experiment includes the special objectives for characteristics of regional phenomena, and is to be connected not only with other experiments of GAME, but also with other international experiments, respectively. The validation for satellite data, such as TRMM, ADEOS-2 and so on, is also one of objectives in regional experiments.

(2) Common observation components

Long-Term observation

- One-dimensional radiation, fluxes and soil moisture observation in various land surfaces
- Water budget observation, in basins on various scales

Short-Term observation in IOP (Intensive Observation Period)

- Radio-sonde observation
 - Radar and /or doppler-radar observation*
 - Soil moisture observation
 - Airborne observation*
 - Validation for satellite data
 - Others
- (*: it is to be implemented on the limited regional experiment)

(3) Selected regions for GAME

The eastern half of Eurasian Continent under the influence of Asian monsoon is very wide and includes different climate zones. On considering the final scientific goals of GAME, the following representative regions are selected as observaion fields for energy and water cycle caused by the interaction between atmosphere and land surface. These are as follows;

1) Tropical region:

It includes Chao Phraya River Basin in Thailand, forest in Sarawak, Malaysia, and Sri Lanka. This regional experiment is named as GAME-Tropics. It is to focus on clarifying the difference of latent heat fluxes in various land surfaces, such as paddy field, bare-land and forests in both the tropical monsoon zone in Thailand and the tropical rain forest zone in Sarawak, and observing intensively the interaction between atmosphere and land surface among pre-monsoon to mid-monsoon. Formation process of river discharge is also important issue under wide range of soil moisture condition.

2) Sub-tropical region:

HuaiHe River Basin located between HuangHe River (Yellow River) and ChangJiang River (Yangtze River) in the eastern part of P. R. China is selected as sub-tropical region. Its experiment

is named as GAME-HUBEX (Huaihe River Basin Experiment). The intensive observation is to focus on the formation process of meso-scale cloud/precipitation systems caused by the Baiu/Meiyu front in the summer and macro-scale hydrological models are to be developed for the forecasting of drought and flood events.

3) Tibetan Plateau:

Tibetan Plateau is also selected as a principal component for GAME. It is named as GAME-Tibet. Though GAME-Tibet is going to implement the field experiment in collaboration with TIPEX (Tibetan Plateau Experiment) organized by Chinese scientists. It is to focus on the formation process of the interaction between atmosphere and land surface in the western dry area and the eastern wet area in Tibetan Plateau among pre-monsoon to mid-monsoon in the intensive observation period.

4) Linkages to other international experiments and programs

As four experimental regions in GAME include various climate zones, it should have close relation to other GEWEX plans, such as GCIP, MAGS, LBA and BALTEX. In the same time, it is desirable to collaborate with other programs of WCRP and IGBP in some regions.