

# MAHASRI-Monsoon Asian Hydro-Atmosphere Scientific Research and Prediction Initiative-

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## Introduction of MAHASRI

The international research program on the water and energy cycle in the Asian monsoon, named GAME (GEWEX Asian Monsoon Experiment: <http://www.hyarc.nagoya-u.ac.jp/game/>) successfully finished in March 2005. The scientific understanding, research strength, scientific collaboration, and organization from the GAME project have paved the way for investigation in the next stage of the program to improve the prediction of the Asian monsoon and its hydrological cycle. Herein, we propose a new international program in Asia, tentatively named MAHASRI (Monsoon Asian Hydro-Atmosphere Scientific Research and Prediction Initiative), focusing on establishing scientific basis for predicting hydro-climate monsoon system with intraseasonal to seasonal time-scale, including developing prediction systems for droughts and flood conditions of regional or river-basin scales. This program should undertake an essential role in WCRP activity in Asia, as one of the CSEs (Continental Scale Experiments) in GEWEX, in close cooperation particularly with CEOP Phase-II and CLIVAR (Climate Variability and Predictability), and will contribute to other related international initiatives (e.g., THORPEX, GWSP, IHP-PUB etc.).

## Objective and scientific topics of MAHASRI

The objective of MAHASRI is: To establish hydro-meteorological prediction system, particularly up to seasonal time-scale, through better scientific understanding of Asian monsoon variability

The scientific topics will include:

- Atmosphere-ocean-land interactions in the Asian monsoon system, in particular, role of orography on monsoon rainfall
- Scale-interactions among diurnal, synoptic, intraseasonal and seasonal variability of Asian monsoon
- Interactions of surface and boundary layer processes with convective cloud system
- Effect of human influences (i.e., aerosols, land-use change, and greenhouse-gas increase) on hydro-meteorological variations in Asian monsoon regions
- Transferability of land-surface hydrological models and parameters for prediction of ungauged basins

## Differences from the GAME project

The differences from the previous GAME project will be:

- More concrete collaboration with Asian hydrometeorological agencies and research institutes, then will present proto-type model for the hydrometeorological prediction system
- Expansion of the target field including air-land-sea interaction, thus closer collaboration with CLIVAR community
- Targeting both Asian summer and winter monsoon
- Expansion of the target area over the maritime continent, Western Pacific, and India, while retreat from Siberia
- Accordingly, the study regions in the MAHASRI will be re-structured as follows:
  - Tropics (including India and the maritime continent)
  - Tibet/Himalaya
  - East Asia
  - Northeast Asia

## International collaboration strategy

As an international collaboration, the following items have been considered:

- Facilitate and/or improve hydro-meteorological observations in Asian monsoon countries in conjunction with GEOSS
- Cooperate with CEOP-II by observations, data and hydrometeorological studies in Asian monsoon
- Contribute IPY by conducting intensive observations in Asian monsoon region
- Capacity building for observation, analysis, data-integration and modeling
- Data exchange to establish an integrated database

The MAHASRI International Science Steering Committee (MISSC) has already been organized and will coordinate both national and international research activities in the MAHASRI. Now the web-site has been open to public ([http://mahasri.cr.chiba-u.ac.jp/index\\_e.html](http://mahasri.cr.chiba-u.ac.jp/index_e.html)). In WCRP it is now planned to organize the Asian Monsoon Year or International Monsoon Year in collaboration with MAHASRI-IOP for the period April 2008 to March 2009. MAHASRI is leading these observational studies.