

Draft for Review

International Workshop
on

CAPACITY BUILDING IN ASIA

"EARTH OBSERVATIONS IN THE SERVICE OF WATER MANAGEMENT"

26th -28th September 2006, Bangkok, Thailand

Summary of Proceedings

The International Workshop on Capacity Building in Asia on the theme 'Earth Observations in the Service of Water Management' was held at Ramagarden Hotel, Bangkok, Thailand from 26th to 28th September 2006. The workshop was co-hosted by Integrated Global Water Cycle Observation (IGWCO), Group on Earth Observations (GEO), Japanese Aerospace Exploration Agency (JAXA), University of Tokyo (UT), Asian Institute of Technology (AIT), United Nations University (UNU), United Nations Social Commission for Asia and the Pacific (UN-ESCAP), World Meteorological Organization (WMO), World Climate Research Programme (WCRP) and the International Centre for Water Hazard and Risk Management (ICARM). Sponsors of the Workshop were JAXA, UT, and WMO.

The workshop was aimed at exchanging information on best practices and available tools for applications of Earth observations for water resource management in the Asian region. It was specifically intended to consolidate regional requirements upon the existing infrastructure and to hold discussions in way of identifying urgent needs in terms of the well-being of society and thereby to propose Regional Capacity Building Projects for applications of Earth observations for water resource management in Asia.

The workshop was attended by 121 participants from 22 countries. In order to assure high-quality, interactive participation, about half of the attendance at the workshop was by invitation and included policy makers, Earth observation providers, resource managers and top academia mainly from 55 state sector organisations.

Proceedings of workshop, which had its occurrence over three days was well split into 5 main Plenary Sessions excluding the Opening Session. Sessions 1, 2, and 3 which held during Day 1 were devoted for Policy makers. Target groups for Session 4 and Session 5 which held during Day 2 and Day 3 respectively were Earth Observation Providers and Water Resource Mangers.

Plenary Session 1

During Session 1, participants were provided with an introduction to GEO, GEOSS as an objective of GEO, and IGWCO and their activities in collaboration with other international organisations and space agencies pertaining to Water Resource Management and Capacity Building. In line with the above, the consensus of the 1st Asian Water Cycle Symposium held at UT, 2-4 November 2006 and under the vision of GEOSS was presented. Accordingly, activities consequent to the said symposium, particularly, the success story of the Asian Water Cycle Initiative and the Implementation Task Team's (ITT) Working Session held on 25th September 2006 was reported while recognizing significant progress rendered by ITT to date in developing implementation plan for Integrated River Basin Water Resource Management projects in the region and expecting their continued cooperation in the future.

A discussion followed the talks on the Asian Water Cycle Initiative and some participants who do not have membership in ITT were also seen to show their willingness to take part in the activities. UNU, made a request accordingly to send the report on activities to all groups enabling the interested to take part.

Plenary Session 2

Session 2 of the workshop was utilised to make aware the participants of the International and Regional Programmes on Best Practices for Applications of Earth Observations for Water Management on Capacity Building. The Session comprised 8 presentations by Geo-Informatics and Space Technology Development Agency (GISTDA) of Thailand, Indonesian National Institute of Aeronautics and Space (LAPAN), JAXA, WMO, UN-ESCAP, UNU, AIT, and Mekong River Commission.

GISTDA began the Session by briefing on its Earth observation satellite activities with special reference to the Thailand Earth Observation System (THEOS) to be launched in Mid 2007 and the applications of the same to the Water sector and their involvement in Capacity Building.

LAPAN as a data provider introduced its precipitation products and applications of space based observations for monitoring of floods and drought, climate prediction, and rapid damage assessment.

JAXA, with the identification of nine societal benefit areas i.e. disasters, health, energy, climate, water, weather, ecosystems, agriculture, and biodiversity, discussed their present and future missions including those for GEOSS which are TRMM, GPM, AMSR, AMSR-E, GCOM-W, GCOM-C, ALOS, GOSAT, EarthCARE. Activities focussing on water issues such as International Flood Network(IFNet)/Global Flood Alert

System(GFAS), Sentinel Asia and its Flood WG were also presented. Finally, JAXA's involvement in object oriented Capacity Building Projects was highlighted.

WMO conveyed that it has a number of platforms to support the capacity building activities in Asia e.g. the WHYCOS programme, Flood Management and Disaster Prevention. It was also pointed that WMO offers its capabilities for the development of initiatives that support the goals of GEO and IGWCO in the water sector.

UNESCAP drew the attention of the participants on priority challenges in the Water Resources activities in Asia- Pacific and disclosed the regional findings on disasters. UNESCAP also shared their recent experience and developments in valuing the cost of disasters and presented the UNESCAP Template of Assessment.

UNU commenced with an introduction to its Environment and Sustainable Development (ESD) programme which focuses on the interactions between human activities and natural environment and their implications for sustainable development. Three sample activities, 1. Rainfall Forecasting System, 2. Flood Forecasting Modelling System, and 3. Graduate Student Program, which comes under the scope of the above programme were then presented in some detail.

AIT, in addition to its routine academic programmes in the field of RS and GIS, highlighted the Capacity Building programmes conducted by its centre for research and training, the Geoinformatics Center, in collaboration with JAXA and Keio University. Object-oriented, real-world, Mini Project based training and Caravan Training carried out in different localities targeting a larger audience were only two of the several programmes which the participants were made aware of in detail.

The Mekong River commission, at the closure of Session 2, briefed the status of the current short term forecasts (1-5 days) and the intended future medium term forecasts (6-15 days). Flood forecast accuracy with respect to forecast lead time was also discussed. Finally, the Commission sought the cooperation of data providers to improve the weather forecast in the region.

Plenary Session 3

As an extension to Session 2, Session 3 included presentations on National Programmes adopted for Applications of Earth Observations for Water Management and Capacity Building. It was recognized that there are significant ongoing activities as to Integrated Water Resource Management and application of satellite data in many countries in the region. However, from the presentations on activities carried out in 16 countries in the region, several issues pertaining to each country, except Japan, were conveyed. Table 01 summarises the same retaining the order of presentations.

Plenary Session 4

Session 4 of the workshop was devoted to transfer information on available data, tools, and opportunities that could be utilised in the service of water management.

Opening Session 4 of the workshop, ICHARM, the International Center for Water Hazard And Risk Management, presented two of its research activities on global rainfall estimation utilising satellite data and development of an Integrated Flood Analysis System (IFAS) for poorly-gauged stations. Opportunity to seek training on Flood Hazard Mapping at ICHARM was also related.

MAHASRI, the Monsoon Asian Hydro Atmosphere Scientific Research and Prediction Initiative, was then introduced as an initiative to establish a hydro meteorological system, particularly up to seasonal time scale. Having identified that scale-interactions among diurnal, synoptic, intraseasonal and seasonal variability of Asian monsoon, as one of the key issues in the above establishment, typical diurnal, intraseasonal, and seasonal variations were discussed and simulation of diurnal variation of precipitation using cloud resolving model was presented.

PUB, Predictions in Ungauged Basins, was introduced as an IAHS initiative for decade 2003-2012. Accordingly it related its commitment to the reduction of the predictive uncertainty in hydrological science and practice mainly through channels of knowledge sharing and technology transfer. While introducing the 17 Working Groups as the main engines of PUB activities, it welcomed new Working Groups and referred to its website <http://www.pub.iwmi.org> to seek further details and access PUB publications.

JEPP, the Japanese EOS Promotion Program, highlighted its Asian Monsoon and Climate Variability theme comprising a number of water related programmes. Under the above theme Development of Rainfall Observation System in Southeast Asia was taken for further discussion. During subsequent discussions JEPP's assistance towards the establishment of 15 Tsunami Early Warning Support projects and its support for Public Awareness programs was also unveiled.

CliC, Climate and Cryosphere, set with a goal to access and quantify the impacts that climatic variability have on the components of the cryosphere and the consequences of these impacts for the climate system, and to determine the stability of the cryosphere, enlisted 4 project areas under its implementation strategy.

CEOP, Coordinated Enhanced Observing Period, which is as an element of WCRP presented its three unique capabilities; Convergence of Observations, Interoperability Arrangement, and Data Management. CEOP provides researchers and users access to in site data, satellite data and model output data on 35 reference sites in the world. The CEOP system provides also very useful tool for QD, data analysis and visualization. Answering a query on possibility of transferring the QC software, CEOP stated that since the technology involved is of proprietary nature, technology transfer at this stage would be difficult.

MAIRS, Monsoon Asia Integrated Regional Study program subsequent to the identification of environmental changes in monsoon Asia introduced 4 priority research themes Coastal Zones, Mountain Zones, Semi Arid Zones, Urban Zones. During discussion followed the presentation, it was, however, pointed out that to address real world needs research on the above themes should be mixed appropriately to give real world themes, for instance, tropical mixed coastal and urban zones.

Introducing India as one among the six nations involved in space programmes, the ISRO Space Application Centre presented its capabilities on communication, search and rescue services, meteorology imaging, disaster warning system, and data collection platforms. The top-down and bottom up approaches adopted in EO application was also discussed.

Sentinel Asia, the voluntary initiatives for establishing a Disaster Management Support System in the Asia Pacific Region listed out its main activities which are to commence from October 2006 as follows; Emergency observation in the case of major disasters by ALOS, Wildfire monitoring by MODIS, Flood Monitoring by TRMM and AMSR-E, capacity building for utilization of satellite images for disaster management.

ITC, the international institute for geo-observation science and earth observation, presented the strategies to address diversified needs in Capacity Building in geo-information handling. Short courses, distance education, joint courses etc were introduced as adaptations of ITC in this regard. During subsequent discussions, on behalf of JAXA the Bangkok representative informed JAXA's collaborations with AIT, Tsukuba University of Japan, and the Malaysian University in distance education.

As the closing presentation of Session 4, EWBMS, the Energy and Water Balance Monitoring System, a private company of Netherlands, presented its capabilities in monitoring and validation of rainfall and energy balance, and flow and flood forecasting. Determination of evapotranspiration using energy balance processing and mapping of relative evapotranspiration were discussed.

Break-Out Sessions and Working Group Reports

When the participants reassembled after Session 4, they were convened into three Working Groups in order to assess/identify the urgent needs as regards to Flooding, Drought, and Water Quality and thereby to propose regional application projects which would contribute to the GEOSS Water Management SBA. Discussions on the said topics were held in parallel accordingly.

Plenary Session 5

Plenary Session 5 was devoted for presentations of Reports by the three Working Groups which are attached hereto, retaining the order of presentations; Drought, Water Quality and Ground Water, and Flooding.

During subsequent discussions, it was pointed out that the works in relation to drought prediction/forecasting is still in its infancy offering difficulties in forecasts with the present technology. However, early warning is said to be achieved using advanced algorithms. Under the circumstances, awareness programs to prepare the possible victims to combat drought was considered as a crucial activity that needs implementation. The need to identify data, system and services available in the region for drought monitoring and services was indicated by a participant. It was also recommended to develop concrete next steps.

The Working Group on Water Quality and Ground Water drew the attention of all, indicating that the Water Quality is the most neglected yet a critical issue in some countries in the region. Taking Bangladesh as example, it was disclosed that on the contrary to the statement made by the UN World Report i.e. more than 90% of the people of Bangladesh avail drinking water of acceptable quality, about 50% of the people of Bangladesh are consuming arsenic contaminated water of which the quality is well below the stipulated international standards. Hence, the Working Group emphasized that the issues of water quality should be taken up as a matter of priority. The Working Group decided to make a proposal for the task to GEO and subsequent proposal.

With reference to the Working Group Report on Floods, a case of the Global Flood Alert System was presented. In most parts of Asia, flood forecasting, warning and response systems are yet to be established and the most important issue in Asia is to expand the network of flood forecasting and warning systems. Increasing usefulness of satellite information, particularly of the Global Precipitation Measurement (GPM) for flood forecasting and warning system was emphasized. It was suggested that an inventory of existing information services be prepared for the region and ICHARM would take a role in the investigation with cooperation with the group members. It was also proposed to develop demonstration projects in conjunction with the framework of AWCI, Sentinel Asia, etc. The representative of EWBMS, remarked that the acquisition of data from the existing geostationary satellites in flood disaster mitigatory measures needs mention. The ISRO representative followed with a discussion on establishment of compensation distribution in the event of a flood to facilitate the victims to make a reasonable living notwithstanding the loss of property.

Another participant from India while stressing the importance of 'Public Education' of the whole process forwarded his perspective that the same could effectively be carried out through university channels than the others. On this basis, he suggested that a university network be formed for this purpose and requested JAXA's support to this effect.

Based on the working group reports and subsequent discussions it was collectively identified by the participants that

1. Observational data necessary to address the associated issues are lacking and even the available data are sometimes inaccessible and not interoperable. A systematic observation of at least the sensitive and fragile systems considered essential. It was

suggested that a data inventory which would rectify the present anomaly shall be made available at a central location under the purview of either GEO or some other organisation giving easy access to the stakeholders. In this context, it was also suggested that real time data required for flood forecasting and early warning, in particular, be made available, preferably, free of charge and easily accessible .

2. Utilisation of Remote Sensing/Satellite data alone would not allow to satisfy the requirements in solving the related issues and hence integration between remote sensing and the conventional in-situ data need to be streamlined, for instance in the case of drought monitoring in-situ measurements on terrain variables should complement remote sensing data. Not only the data but also the water related issues in some aspects need to be solved taking an integral approach.
3. Public education and awareness programmes need strengthening to in order to make the high profile efforts more meaningful. Which channel in this respect, government or academic, could play an effective role was subject to much debate. However, it was agreed upon that national efforts complimented by international support shall be the path way.
4. Earth Observation Providers/Space Agencies shall prioritise their action plan in such a manner to cater the urgent needs of the society which would eliminate the associated risk.
5. In order to utilise the emerging Earth observation data and associated techniques from different sources, Capacity Building programmes in different modules and at different stakeholder levels shall be devised and implemented.

JAXA reported as workshop secretariat that the workshop report will be made to CEOS Plenary, IGOS-P meeting and GEO-III in November. It will be also reported to the 2nd Asia Water Cycle Symposium and GEOSS Outreach Symposium in January 2007.

The participants agreed on the need on regular Capacity Building workshops in order to address the above needs in the region. With such request, JAXA took action to consider planning the 2nd workshop.

Adjourn

The chair adjourned the workshop by thanking all participants for their valuable contribution, the hosts without the generous contributions of whom the Workshop would not have been possible, and the unstinting support of all who worked behind the scenes to make the Workshop a success.