

2nd Breakout session: Implementation proposal

1. Please describe Steps and Strategy following the three approaches:

Framework development approach – describe desirable framework in your country

- Demonstration design ↔ infrastructure integrity
- Introducing legislation → high level coordination body → research promotion → Improvement of awareness → private sector involvement

Strategic approach

- Showcase: intention, background, objectives, collaborations, achievements with accuracy and feasibility, benefits to other sectors, interest → involvement one by one starting with existing inter-agency collaborations)
- Demonstrations → regional and general commonality
- Expansion of the AWCI demonstration studies to a whole region → sharing experiences → a holistic understanding and technology.

Technical approach – propose a technical approach considering your target basin/country

Monitoring → understanding → Climate change assessment including downscaling, bias correction → detail assessment → model → demonstration → mainstreaming → creation of regional knowledge

2. Additional resources – suggestion of potential collaborators

- Identifying local, national, regional, and worldwide (including UN) collaborators in the field of research, operation, administration, financial and human resources supports. Please fill the matrix:

Vertical: local, national...

Horizontal: research, operation....

- Mainstreaming water and climate change within the national policy by getting supports from water nexus.

Please describe mainstreaming strategy suitable for your country.

3. Specific request to GEOSS and to international community (data/tools accessibility)

Describe in a concrete way specifically for your country needs:

- Inventory and summary directory – what kind is needed in your specific case
- Data request function responding to new needs – what kind of function
- Data access and information exchange
- Models and Tools: analysis, prediction, early warning, risk assessment, decision support – what kind for what purpose
- Regional office and/or data center – what kind of function you expect for the office

4. Coordination between water cycle integration and capacity development Strategy

Identify contents of capacity development needs in your country

Introduce existing and on-going activities and the needs and support related to these five items:

- Synchronize capacity development with national implementation programme coordinated by the regional programme.
- Training for not only researchers but also practitioners from top level to operator/technician's level, with appropriate standards depending on the level (various kinds of training) including trainer's training to be followed by practice and identify it as a postgraduate program in collaboration with international educational framework (e.g. UNU, UN-CECAR).
- Short term capacity development workshops on specific observation and modeling skills and medium to long term supports to regional resource centers.
- Coordinate with national and regional centers of excellence (ex. WMO centre in Hanoi on WR)
- Organize capacity development workshops in each country for the agencies involved in the project at national level on the WCI implementation. Identify agencies and participating organizations for making such an opportunity.

5. Schedule

Jan. 2012 5th GEOSS AP Symposium: Preparation for Implementation Plan

Oct. 2012 4th AWCI Symposium: Approval of the 2nd stage implementation plan

2013-2015 step 1 demonstration project (feasible study) at each basin

2016-2018 step 2 project implementation at national and/or regional scale

Please make a rough design for step 1 and step 2.

Due date for the input: THURSDAY, 15 DECEMBER 2011

*Based on the inputs from countries following this template a paper will be drafted for submission to a journal with intention to contribute to IPCC AR5.

**The template will be sent to ADB, JICA,...and a report will be asked for GEOSS AP Symposium session in Ahmedabad, January 2012.

1. Steps and Strategy

SEA

- Challenge of deciding of strategy is a topic that would get various of institutions in each country to collaborate on an important objective
- This objective could be a national focused topic or a regional programme that could benefit each country
- The different proposals were
- Cambodia:
 - A regional project coordinating data sharing with national water and agriculture programme on
 - Climate forecasts
 - DEM
 - Landuse and landcover,
 - Ground based monitoring systems
- Vietnam:
 - Regional project on Urban inundation and early warning
- Laos:
 - to get implemented DP basin (Xebangfai) by the help of AWCI expert mission to lead the CCAA; flood/drought, forecasting & early warning systems
 - Downscaling of models for application at DP site
 - Regional project : replication of sustainable scientific results of CCAA
 - National project: improvement the performance of National Water Resource Operating Center
- **Malaysia:** CCAA on water resources and water related infrastructure integrity
- **Thailand:**
 - the programme of capacity building on climate change assessment and adaptation related to water resource issues
 - Focus on local scale: Strategy: some countries and WCI provide new knowledge, technology, information network, warning system in context of water resource management pass through some workshop, training and visiting in successful agencies and sites (department of water and so on)
 - Focus on regional scale: Training workshops on data processing, technique and sharing.
- **Vietnam:** regional project urban inundation management and early warning
- **Myanmar:** regional and national (DP) project for flood management under climate change

SA

- Introducing legislation to address the climate change and water cycle related issues in development processes
- Establishment/ strengthening of a high level coordination body to address the climate change impacts and adaptation
- Promote research on climate change and adaptation
- Improve awareness of climate change and impacts, adaptation at levels
- Efforts to bring private sector to fund climate research in universities and research organizations

EA

1. Encourage other sectors to join us: SHOWCASE OUR RESULTS
 - We have to show them our studies on the relationship of the hydrological cycle and water system on the basis of climate-change impact assessment including downscaling; show our objectives and show the benefits to each sector.
 - Our intention and background of AWCI should be clearly explained
 - We should begin with the studies in each demonstration basin in each country, apply the research to the practitioners, identify real problems in different basins, then we can show accuracy and feasibility to other sectors
 - We should have a general and common topic of each demonstration study such (but might be difficult because of various problems in each basin).
2. If they get interested and join, one by one they can have a more cooperative research
 - Suggesting to start from existing institutions (already involved to maximize existing inter-agency collaborations)
3. Start from AWCI members
 - At the first stage, each demonstration study would be very specific from country to country
 - At the next stage, we should share experiences with each other to come up with a holistic understanding and technology.
 - It would be also suitable to extend the demonstration study to a whole region, such as climate change and its impact studies. This will come up with studies on methodology for different issues (collaboration of the region with same issues).

S/G

- Dense monitoring network of hydro-meteorological variables in mountainous regions. (Financial support for establishment, operation and maintenance)
- Increase understanding of Himalayan Glaciers – potential causes of GLOF.
- Climate change assessment
 - Downscaling of GCM to basin scale
 - Bias correction

- Flow/Snow-cover variability in past and future - assessing the detailed contribution of snow/ice melt and rainfall to the river system.
- Development of integrated physically based distributed hydrological model for snow/glacier melt runoff and GLOF.
- Mainstreaming the snow and glacier issues in national policy.
- Develop regional collaborative plans to secure fundings from international funding agencies
- Creation of regional knowledge for studying impact of climate change on snow/glaciers for AWCI member countries.
- APN proposal on assessment of CC impacts on snow/glacier melt runoff and water cycle variability on Asian river basins.

2. Additional resources – suggestion of potential collaborators

SEA

- Proposed collaborators are
 - Cambodia:
 - Ministry of water resources and meteorology
 - Tonlesap authority
 - Other line agence
 - Laos: Assistance from Korea government
 - Malaysia: Meterological , Agriculture, Townplaning, environment, public works, irrigation and drainage departments
 - Thailand: NRCT, RID
 - Vietnam: space-based information institutions; remote sensing organization; MRC
 - Myanmar: finical support from ADB or other organization for the above project

SA

- Funds for WCI activities from national and international organizations
- More funds for research for climate change adaptations to universities and R & D institutions
- Transfer of tools including models (GCM output downscaling, hydrological), Data to local agencies
- Funds for development of local data acquisition

EA

- Financial and human (technical) resources are required.
- Support from other sectors are also required. Besides, we should collect data from them such as:
 - Agriculture: Crop production data
 - Health: incidence of diseases

- Example in Japan: We have already been collaborating with a few relevant ministries and getting some support and additional resources, because they already understand the needs and the importance of water, climate and earth observation.
- Potential collaborators: FAO, UNESCO, WMO, etc., and existing institutions at a local level.

S/G

- ICIMOD
- World Glacier Monitoring Service (WGMS)
- International Commission on Snow and Ice (ICSI)
- Japanese Society of Snow and Ice
- National focal point on climate change of each member country
- ADB/WB/JICA/ETH/GIZ/DFID
- UN adaptation Fund
- APN

3. Specific request to GEOSS and to international community (data/tools accessibility)

SEA

- Cambodia:
 - DEM, Landuse, high resolution cc projections
 - Tools for data analysis
- Laos
 - ADB, Korean government
- Malaysia
 - High resolution DEM
- Thailand
 - Satellite data
- Vietnam:
 - Regional space based data, CCAA modeling
- Myanmar:
 - GIS data (landuse, landcover, DEM)
 - Climate projections
 - Rainfall forecasts, flood forecasting tools

SA

- To make easy access to global datasets and specially to receive more high resolution and near real time and real time data
- More conducive environment for exchange of information (sharing of experience through academic programs and training)
- Regional office for AWCI to coordinate activities under auspices of GEOSS

EA

- Access to the tools developed by AWCI (IFAS, WEB-DHM, etc.) enhance more on this;
- Request Global datasets and global tools
- We need any summary directory of the available tools and datasets that we currently can make access to.
- Data access should be improved, for example:
 - NCDC global data; discharge data not only monthly (open) but also daily (as requested)
 - GPCC for precipitation not only monthly (open) but also daily (impossible at present);
- Enhance more on capacity building
- Establish new framework since new need arises. For example, in 1950's, meteorological agencies in the world agreed to share their data due to their needs on numerical weather forecast. But this was not true of hydrological agencies. Now, hydrological data sharing is now getting indispensable under the era of climate change.
- DIAS is a very good interface for uploading and data access
- Impact assessment models to evaluate risk related to different sectors at the local level are required.

S/G

- A complete glacier inventory of Asian mountain regions
- Identification of potentially dangerous Glacier Lakes.
- Establishment of GLOF early warning system/communication system
- Transboundary data sharing related to Cryospheric hazards.
- Establishment of regional GEOSS data center.
- RS/GIS tools application.

4. Coordination between water cycle integration and capacity development

SEA

- Synchronize capacity development with national implementation programme coordinated by the regional programme
- Short term capacity development workshops and medium to long term secondment to regional resource centers (RIMES, Water knowledge hub Malasia, etc.)
- Coordinate with national and regional centers of excellence (ex. WMO centre in Hanoi on WR)
- Organize capacity development workshops in each countries for the agencies involved in the project at national level on the WCI implementation

SA

- forum to coordinate:
 - Development of tools,
 - Capacity development programs through universities/RI and other organizations

EA

- Training for not only researchers but also practitioners from top level to operator/technician's level, with appropriate standards depending on the level (various kinds of training).
- Trainers' training;
- Local trainings (request the experts to come to our countries and provide some logistics)
- Practice after the training

S/G

- Organization of short term trainings/workshops for GCM downscaling/bias correction/hydrological modeling and snow/glacier melt runoff modeling.
- Snow estimation via remote sensing
- To estimate the total volume of water locked in glaciers.
- Ground Penetrating Radar (GPR), ice core drilling and proper logistics and lab facilities

5. Schedule

SEA

- 0-6 Months:
 - Develop the common regional program that can address national interests
- 6-12 Months:
 - Develop national teams
 - Seek funding for implementations
 - Organize capacity development programmes
- Year 1 – 3
 - Project implementation

SA

- 1st year :
 - Capacity building on use of the models
 - downscaling
 - hydrological models
- 1-3 year:
 - Research proposals/projects
- 2- 3year:

Installation of data acquisition systems

- 2 year : Establishment of regional centre

EA

- 5 years should be required
- Step by step:
 - Step1 (3 years): Country-oriented
 - Step2 (2 years): Integration
- We need to get financial support, possibly under the framework of GEOSS in each country.

S/G

- Total duration: 6 years
- Bi annual meetings

Year 1	CC scenario generation in basin scale human resource development Hydro-met. observations/Instrumentation (Continuous process)
Year 2-5	Inventory of snow/glaciers Development of Snow/glacier melt model, GLOF warning system. Methodology for GLOF and in-aundation
Year 5-6	Assessment of CC/ Reporting Finalization of inventory