Capacity building for drought management

- **Why drought management in Asia?**
- **Main issues of drought management**
- **Needs for capacity building**
- **Order of priorities in C.B.**
- **Proposal for next steps**

Drought in Asia

- One of the major natural disasters with prolonged severity and widely spanning impacts on society and economy;
- High inter-annual variability related to Asia monsoon variation;
- Increasing trend of frequency and intensity of occurrence of drought disasters in related to global warming and other anthropogenic effects;

Crucial in sustainable development of Asia

Issues of drought management

- **Monitoring/early warning**:integrated in-situ ob. and satellite data; data and information system; information transfer, communication
- **Prediction:** climate and other variables of land surface at high resolution and leading time.
- **Mitigation:** agriculture and crop system; water supply and management,etc.

Current available information on drought monitoring and warning

1. The meteorological department/agencies in the respective countries are responsible for the announcement of drought conditions in given regions. Drought information is released weekly in some countries.
2. Today, the satellite based information on precipitation and soil moisture is mainly being used on experimental basis. Here, integration of in-situ measurements (automatic) is needed.
3. In some regions, the NDVI based vegetation monitoring and deriving the impacts of precipitation is used as a methods for advisory for the local decision makers.

Recommendation

To understand the drought in different countries well, standardization of definition of drought is necessary in context of meteorological, agricultural and hydrological drought.

Types of drought

- Agricultural
- Meteorological
- Hydrological

Available information on drought prediction

- Currently there are no much information on drought prediction in most of Asia countries;
- Only Korea and China have reported their operational drought prediction program;

Available information on Drought Mitigation

1) **The main goal of drought mitigation is planning for conservation of soil and water.Watershed planning is a globally accepted method for drought mitigation.**

2) **Watershed developmental planning, monitoring and evaluation of program implementation needs to be taken up concurrently .**

3) **Space based remote sensing information is useful, for mapping the existing natural resources like soil, ground water potent slope, land capability and land use, wh essential for watershed planning and implementation.**

Available information for Drought Mitigation

4) **DEMS generated by space based remote sensing are very useful for soil and water conservation which is primary goal of watershed management programs specifically in drought prone areas.**

5) Even in irrigated areas sometimes drought occurs because of improper irrigation scheduling. Optimized irrigation scheduling requires proper understanding of crop water requirement based on the type of crop and stage of growth using remote sensing and meteorological data. Furthermore, remote se provides operational methods for crop identi and area delineation .

Needs of satellite data for drought monitoring and related Capacity Building

parameters	Data source	Capacity building needs
NDVI	Optical RS data	**Sharing of experiences with member countries**
Moisture stress index(MSI)	Optical RS data (NIR, SWIR)	**Sharing of experiences with member countries**
Soil moisture index(SMI)	Optical RS data	**Sharing of experiences with member countries**
Soil moisture estimation	microwave	**a topic for research and development.**
Snow cover estimation	Optical RS data	**Sharing of experiences with member countries**
relative evapotranspiration	Optical RS and meteorological data	**experts needs to be invited for training and identifying pilot projects for validations in respective regions.**

Gaps and Needs for Capacity Building

1. The state of art on tools and techniques are not available operationally in most of the developing countries for inferring drought conditions. Need for sharing the successful experiences.

2. Needs to document experiences and methods in using RS data in inferring agricultural drought, training on this aspects either by interactions, e-learning etc. The experiences gained to be documented and circulated amongst member countries.

3. Space based imaging and in-situ measurements needs to be integrated.

Gaps and Needs for Capacity Building

4, Successful programs in the region on drought management needs to be documented and circulated, highlighting the gaps and need for improving the tools and methods .These gap areas are to be taken up as collaborative research projects as part of capacity building.

5, Training of using satellite information and modeling for scientist in developing countries

6, Urgent need for capacity building by organizing interactive workshops, undertaking pilot projects in member countries involving both space agencies and user organizations.

Recommendations: Capacity Building at Different Levels

a) Awareness program for the policy-decision makers.

b) Interactive workshops amongst user organizations and space agencies.

c) Identify priority areas and take up pilot projects in respective regions.

d) Technology promotions in the respective regions on new developments.

Order of priorities for capacity building

- Improve the capacity of monitoring the drought;
- Establishment of warming system for releasing report to users and decision makers;
- Improve the prediction capability;
- Improve the capacity of mitigation to drought damages

Steps to be undertaken (1)

- **Formation of a working group on drought management in Asia and to draft a work plan immediately;**
- **Ask each Asia country to answer a questionnaires in relation to drought monitoring/warning, prediction and mitigation in January 2007;**
- **To organize a workshop for gap identification and needs for capacity building based on documented information from questionnaires in first half of 2007;**

Steps to be undertaken (2)

- To organize a series of training course of apply satellite data for drought monitoring and use for mitigation in 2007-2008;
- Development of a drought prediction systems at regional level in selected countries, such as Japan, China and Korea in 2007-2009;
- Development of several mini-demonstrate projects of monitoring and warning system of drought and then the prediction and mitigation in selected Asia countries in 2007-2008;
- Summary of progress in 2007-2009

Conclusion

Technology development in space segment is moving rapidly, however technology and information assimilation in the ground system needs certain lead time . Hence continuous capacity building at various level is essential.

THANK YOU!