

Messages for Decision & Policy Makers and Water Managers on Adaptation to Climate Change through Integrated Water Resources Management IWRM at River Basin Level

UNESCO¹, ADB²

As a result of global warming, the type, frequency and intensity of extreme events, such as tropical cyclones (including hurricanes and typhoons), floods, droughts and heavy precipitation events, are expected to rise even with relatively small average temperature increases. Changes in some types of extreme events have already been observed, for example, increases in the frequency and intensity of heat waves and heavy precipitation events. (Meehl et al. 2007) [UNFCCC climate change: Impacts, vulnerabilities and adaptation in developing countries]

We are faced with the urgent and vital challenge coping with climate change impacts through water

Message 1: Adapting to uncertainty is the challenge

Increases in the frequency and intensity of extreme events have already been observed. But it's the huge uncertainties associated with these projected changes that are among the principal causes for concern.

Adapting to these inevitable uncertainties has been widely recognized as being as important as mitigation. Even in a future scenario whereby mitigation is successful, the effect of global warming would still remain considerable.

Message 2: Climate change impacts on water at the river basin level

The variability of change has a direct impact on the water cycle at the river basin level. The impacts of climate change are compounded by the risks associated with terrestrial and aquatic ecosystems, particularly the availability of agricultural, municipal and fresh water; the quality of drinking water; and flood and drought events.

Message 3: Adaptation must involve the entire river basin and that includes land use and urban planning

Adaptation strategies, including the regulation of land use (i.e. flood hazard zones, deforestation), must be taken into consideration at the earliest stages of land use, irrigation and urban planning.

It is crucial that a holistic approach is adopted and that adaptation is applied to the entire river basin including all water uses. Stakeholders also need to consider the many aspects of water management: storage, allocation among various users, distribution, discharge, treatment, environmental management and quality.

Achieving a balance between the management of structural measures (i.e. dikes, dams) and non-structural measures (i.e. warning systems land use planning) means refraining from placing too much emphasis on each sectoral standpoint and instead focusing on a strategic point of view based on the entire river basin and its multifaceted needs and potential impacts as climate variability increases.

Message 4: IWRM is a practicable tool for adaptive

IWRM 'Integrated water resources management' is an existing global concept to achieve sustainable water and land management. It provides a systematic approach to planning and management covering a

¹ United Nations Educational, Scientific and Cultural Organization

² Asian Development Bank

wide range of processes and actions, and includes stakeholders' participation in its decision-making processes. IWRM is an appropriate process for climate change adaptation that water managers can use as it facilitates practical and holistic implementation of the principles of sustainability.

Message 5: Strengthening governance at national and at river basin level is key

The development of an institutional framework at the level of central government, (for instance a water committee, a climate change committee) is paramount when dealing with overarching water adaptation strategies that requires collaboration and coordination among the ministries and agencies concerned.

It is equally essential to endorse river basin organizations/ committees that continuously strengthen cooperation and activities on the ground and which serve as focal points for implementing adaptation through IWRM practices. Setting up river basin organizations in your countries, is key to effective climate adaptation.

Ensuring that coordination mechanisms functions smoothly and correctly requires that organizations at both national and river interface with each other and are linked to an existing institutional management and decision-making roles of local authorities.

Message 6: Strengthen dialogue to encompass scientific findings

Political decisions that deal with climate change adaptation need to be based on sound scientific evidence, or in other words, evolving scientific knowledge needs to be more closely linked with policy making. However, the uncertainties of climate change make it even more difficult for information transfers to occur between scientists and policy-makers. Hence, it is scientists can initiate active dialogue in the decision-making process. RBOs (River Basin Organizations) serve as useful for such exchanges as they deal with tangible decisions that affects much of the population concerned with water uses environment, food security and water-related disasters.

Message 7: Integrated Flood and Drought Management is leading the way

In the past, flood and drought management were considered as separate concerns. Now it's time to lead the way by integrating the two approaches through the implementation of IWRM. Past strategies in the event of floods and droughts may not solely on traditional solutions, basic background concepts and theories in existing management strategies should be used in conjunction with new legal and institutional frameworks designed to foster integration so as to adapt to hydrological extremes.

Message 8: Recognize the difference between developed and developing countries

Different adaptation strategies should be employed depending on the level of development of the country concerned, taking into account the local socio-economic and cultural situation, not least because their degree of attainment is different (for example, infrastructure to control recurrent flood cycles that is estimated to occur every 100 years).

Policy-makers in developed countries have the capacity to tackle new approaches, for instance, they can establish new facilities or improve the insurance system that cope with the phenomena caused by climate change as they occur. Developing countries on the other hand would continue working on projects already underway in an attempt to improve their infrastructures through adaptation. Nevertheless, new strategies are required to cope with the constant stream of new challenges, such as water scarcity and extreme events.

In the past, successful policies in developed countries would be adapted to the policies of developing countries. However, a number of circumstances have newly arisen that can no longer be solved by taking this habitual route. For example, flood protection measures often lead to the construction of supplementary infrastructure such as dikes and dams yet these structural and mechanical means could prove ineffective faced with the huge uncertainties of extreme events. Vulnerable areas would therefore

have to apply a holistic approach to address such considerations as urban planning and land use regulation in existing hazard zones, which would increase resilience and serve to limit the extent of future potential damage.

Message 9: Operations should work with existing infrastructure

The management of existing infrastructures, and its flexible operation, is an important factor in ensuring the success of adaptation, especially in countries with limited financial resources. With countries in better financial resources, it is still important to consider any infrastructure improvement within a broader IWRM framework when implementing options to adapt to climate change, for example, additional storage infrastructure to manage droughts should also consider demand management and the management of low environmental flows.

Message 10: Identify hotspots and vulnerable areas

Identifying hotspots and vulnerable areas will allow us to focus on appropriate actions under limited resources when dealing with and responding to climate change.

As regards flood adaptation and uncertainties, it would be more efficient and cost effective to focus adaptation in the most vulnerable areas rather than imposing area-wide coverage.

Message 11: Climate change can possibly lead to conflict

Climate change may lead to lesser water security and therefore a greater incidence of conflict. Therefore it is imperative to have a deeper understanding of this phenomenon and its associated socio-political linkages. A new suite of cooperative approaches and coordinated actions are needed. In the case of trans boundary water resources, international cooperation frameworks are needed to promote dialogue aimed at strengthening and improving climate change adaptation policies in these situations.

Inseparable Links

Examples:

- Land use change, such as urbanization and deforestation, impacts both on water scarcity and flood discharge.
- Urban planning is closely linked with water demand management as well as for the conservation of flood vulnerable areas.
- An intake facility for water use is a potential obstacle to the flood flow.
- Dam capacity is often shared between water uses as well as flood management
- Flood water could be stored for water use.

Relationship with the Environment

Examples:

- Insufficient water quality and lack of water quantity both have negative impacts on the environment.
- Management of water quality and water quantity requires a holistic approach in the river basin, including management of water use (demand) and waste water.
- Flood phenomena often change river courses and its associated ecosystem.