

Thematic Recommendation

Theme B: Water-related Disaster Management

1. Overview and Background

Asia Pacific is the most vulnerable to water-related disasters in the world that hinder sustainable development and poverty reduction in the region. Since 1980 to 2006 over 600 thousand fatalities were recorded and nearly 4.5 billion people were affected accounting over 80% of the casualties recorded worldwide, in addition to over US\$ 8 billion worth of economic damages during the same period in the Asia-Pacific region according to EM-DAT data base. Furthermore, severe water-related disaster events such as flood, drought, windstorm, landslide, storm-surge, tsunami, water-born disease and epidemics have escalated since the turn of the 21st century.

The correlation between poverty and population density versus toll of human casualties is evident revealing how poverty, societal inequality, and lack of political commitment to adapt to the changing risk also create additional elements of vulnerability to water-related disasters. Health issues especially the spread of water epidemics and water-born diseases when a disaster occurs are still a big challenge for many communities particularly- the slums. These health issues are very much interrelated to the status and efficiency of supplying adequate clean water and providing sanitation facilities during emergency response.

The Fourth Assessment Report of the IPCC has highlighted the probability of increase in extreme climatic events such as floods, droughts and coastal flooding induced by global warming.

(IPCC 4th assessment report: <http://www.ipcc.ch/SPM13apr07.pdf>)

Fresh water resources and their management

By mid-century, annual average river runoff and water availability are projected to increase by 10-40% at high latitudes and in some wet tropical areas, and decrease by 10-30% over some dry regions at mid-latitudes and in the dry tropics, some of which are presently water stressed areas. In some places and in particular seasons, changes differ from these annual figures. Drought-affected areas will likely increase in extent. Heavy precipitation events, which are very likely to increase in frequency, will augment flood risk. In the course of the century, water supplies stored in glaciers and snow cover are projected to decline, reducing water availability in regions supplied by meltwater from major mountain ranges, where more than one-sixth of the world population currently lives. Adaptation procedures and risk management practices for the water sector are being developed in some countries and regions that have recognised projected hydrological changes with related uncertainties.

Coastal systems and low-lying areas

Coasts are projected to be exposed to increasing risks, including coastal erosion, due to climate change and sea-level rise. The effect will be exacerbated by increasing human-induced pressures on coastal areas. Corals are vulnerable to thermal stress and have low adaptive capacity. Increases in sea surface temperature of about 1-3°C are projected to result in more frequent coral bleaching events and widespread mortality, unless there is thermal adaptation or acclimatisation by corals. Coastal wetlands including salt marshes and mangroves are projected to be negatively affected by sea-level rise especially where they are constrained on their landward side, or starved of sediment. Many millions more people are projected to be flooded every year due to sea-level rise by the 2080s. Those densely-populated and low-lying areas where adaptive capacity is relatively low, and which already face other challenges such as tropical storms or local coastal subsidence, are especially at risk. The numbers affected will be largest in the mega-deltas of Asia and Africa while small islands are especially vulnerable. Adaptation for coasts will be more challenging in developing countries than in developed countries, due to constraints on adaptive capacity.

Observed global warming of 0.6 degrees during that last century has been identified as the major cause for the accelerated retreat of two thirds of Himalayan glaciers. IPCC also states that *"Himalayan Region is a "blank spot" due to the paucity of data for the region. Glacier melt in the Himalayas is projected to increase flooding, and rock avalanches from destabilized slopes, and to affect water resources within the next two to three decades. This will be followed by decreased river flows as the glaciers recede."* The impact of Climate Change to the current rising trend of the sea level is creating additional vulnerability to already vulnerable low-lying small island countries in the Pacific and deltas in the region. For example, the Marshall Islands in Central Pacific is at the front to suffer from the disastrous impacts of sea-level rise.

To fill the current gap in water-related disaster management at regional and national level, a unified action involving all key stakeholders must be undertaken. The national governments should bear major responsibility to establish national disaster management strategies/plans as well as execution of major disaster management actions in proper collaboration with local governments, communities and other stakeholders. The real challenge, however, lies in striking and sustaining an optimal balance between the development needs of many Asian developing economies (especially influenced by population growth, food and energy security issues) and the risks associated with the use of flood-prone land, within given institutional structures and under given uncertainties concerning the future state of the water regime. As such disaster risk reduction cannot be an isolated undertaking, but must be mainstreamed into development planning of various sectors, such as urban, river, land-use and agricultural planning.

The best-mix of both structural and non-structural measures need to be sought as measures for disaster management in Asia-Pacific region, for optimizing use of limited available resources. Structural measures such levees and water/sediment regulation facilities need to be steadily implemented for they would cover the physical protection level from disasters. At the same time potential significant environmental impact of any measures would need to be factored into the decision-making processes together with the socio-economic factors, under the awareness that final decisions on such developments are matters of societal choice.

On the other hand, non-structural measures such as warning systems, hazard maps, basin management plans and empowerment of flood defence community groups, have been recognized efficient especially during the extreme events which could not be prognosticated and anticipated. Investment on both structural and non-structural measures for water-related disaster management needs to be duly considered as stated during the concluding statement in Asia-Pacific Regional Document of the 4th World Water Forum as follows: *"Developing and improving appropriate structural measures to reduce damage from water-related disasters is a lengthy and expensive process. However, over the long term, a precautionary approach whereby funds are allocated pre-emptively would significantly offset the funds currently required for recovery activities..... the key to reducing vulnerability lies in increasing preparedness through pre-emptive activities: early warning systems, raising awareness and evacuation planning. Coordinated efforts to adopt these measures would go a very long way towards dramatically decreasing the number of deaths caused by water-related disasters – a key priority for the region."*

From a global perspective, the Millennium Development Goals (MDGs), the Hyogo Framework for Action 2005-2015 (HFA), and the Hashimoto Action Plan together provide a set of strategic goals and global actions to substantially reduce the effects of

disasters on life and livelihood over the next decades. Thus it is also vital that national and local development plans are formulated to mainstream water-related disaster management including climate change and climate variability into national water and land management policies and practices.

2. Recommendation statements

- **Integrate water-related Disaster Risk Reduction (DRR) into National Development Plan of Asia-Pacific countries, recognizing the adaptation to increasing risks by climate change as the highest priority issue.**

In AP region, considering that the majority of natural disasters are water-related, the current increasing trend in loss of life and livelihood triggered by water-related disasters, floods in particular, can be regarded as major impediment to sustainable development and poverty reduction. The expected increase in the severity of water hazards being caused by Climate Change (e.g. Global Warming) would further exacerbate the damages from water-related disasters if combined with existing vulnerabilities such as ill-performing social, cultural, political and management factors. Especially the adaptation to the possible increase in risks from global warming is a new and common challenges to the AP countries and thus need be regarded as a national highest priority that needs to be tackled by various levels/sectors in concerted manner.

Therefore the establishment of a comprehensive policy to manage water-related DRR is a must and need to be integrated into the national and local development plans for water-related DRR. This can be supported by a key message adopted and included in the “Hyogo Framework for Action (HFA)” on occasion of the World Conference on Disaster Reduction (WCDR) in Jan. 2005: “Ensure that DRR is national and local priority with a strong institutional basis for implementation”.

In tackling water-related DRR, central governments should continue to assume the key responsibilities for national security and peoples’ well-being through establishing national strategies from longer and wider perspective, ensuring necessary resources and putting various preventive and adaptive measures into practice.

- **Strengthen comprehensive structural and non-structural measures for water-related DRR, recognizing the importance of the Integrated Water Resources Management (IWRM)**

IWRM is widely and internationally recognized as a desirable approach to deal with water issues in comprehensive manner. IWRM is a broad concept that promote integrated management of water in sustainable and equitable manner and thus it involves wide variety of sectors such as physical, geographical, socio-economic and cultural domains. The IWRM approach, therefore, also needs to be applied for water-related DRR.

In this context, we appreciate the statement made at the 6th Ministers’ Forum on Infrastructure Development in the Asia-Pacific Region on 29 August 2007: “We promptly strengthen the comprehensive efforts from both hard and soft sides, based on the recognition that the measure is an important element for integrated water resource management, against water-related disasters.” The adoption of IWRM approach would ensure various forms of integration (e.g. integration of land

and water management, integration of flood and drought management, integration of structural and non-structural measures). This also contributes to the most effective use of limited resources and capacities in the region.

- **Establish national and local goals/targets for water-related DRR, taking the impacts of climate change into consideration**

The effectiveness of water-related DRR efforts generally takes a long time to show visible results on national sustainable development. Therefore central governments, local governments and institutions with focus on disaster management shall identify clear-cut goals/targets in water-related DRR for reducing the loss of life and livelihood, reflecting social and economic conditions of the communities under threat.

Setting proper DRR targets is also a new challenge posed by climate change, under which decisions need to be made on how to assess the magnitude of future hazards and to take adaptive management strategies in uncertain situations.

- **Develop preparedness Indices for water-related DRR for Asia-Pacific region**

The Millennium Development Goals (MDGs) and the HFA among other international and regional frameworks are undoubtedly strong vehicles and momentum to create unified efforts toward a sustainable progress in water-related DRR.

In following-up these frameworks, the development of flood and draught preparedness indices will enable central/local governments to monitor the performance of their achievements and effectiveness of the actions and policies undertaken to reduce the impact of water-related hazards. Utilization of such indices will ensure facilitation of positive spiral of national and local preparedness building in the AP region. These indices need to be adaptable to address community preparedness and vulnerability reduction at each stage of the disaster management cycle.

The indices for water-reared disaster preparedness are believed to help initiate the platform toward the creation of standardized procedure for water-related disaster preparedness, which could be developed into an international standard.

- **Develop water-related disaster warning system and human capacities**

Experience shows that effective prevention strategies would greatly contribute in saving both human and economic losses, rather than investment in response and recovery. In this context development of well-functioning Forecasting and Warning Systems (FWS) is a prerequisite for communities' disaster preparedness and adaptation. To this end, it is necessary to undertake a consolidated review on the currently available FWS in the AP region and develop appropriate FWS within the availability of technologies and resources. Utilization of real-time satellite-data could provide a good possibility to serve AP region where availability of real-time data is scarce and thus need to be promoted.

Community capacity development also plays a key role for successful implementation of various measures in locality. Advanced high-technology can only work when proper local/community capacity development and disaster culture, such as community-based disaster management, are implemented. To this end, various levels of education for flood management peculiar to AP region need to be provided, which enhance local awareness leading to cultivate qualified disaster managers.

- **Create a Knowledge Hub on water-related DRR for AP region and the world.**

In order to contribute to regional information sharing on water-related DRR and to meet various needs attached to this area, it is effective to establish a strategic regional Knowledge Hub (KH) on water-related DRR in AP region. This KH, once established, will contribute to provide various services in integrated and comprehensive manner, such as collection and provision of good local practices, capacity development trainings to various groups, advisory materials in various forms of publication and provision of state-of-the-art technologies. This KH will also serve as a center of excellence through establishment of consolidated network with regional partners in various levels and disciplines, through which it will contribute to the well-being of the region.