

UNFCCC expert meeting on a range of approaches to address loss and damage associated with the adverse effects of climate change, including impacts related to extreme weather and slow onset events
27–29 August 2012, Bangkok, Thailand
Chair: Mr. Tomasz Chruszczow, Chair of the Subsidiary Body for Implementation

COMPILATION DOCUMENT

**A range of approaches to address loss and
damage associated with climate change
impacts**

A range of approaches to address loss and damage associated with climate change impacts related to slow onset events

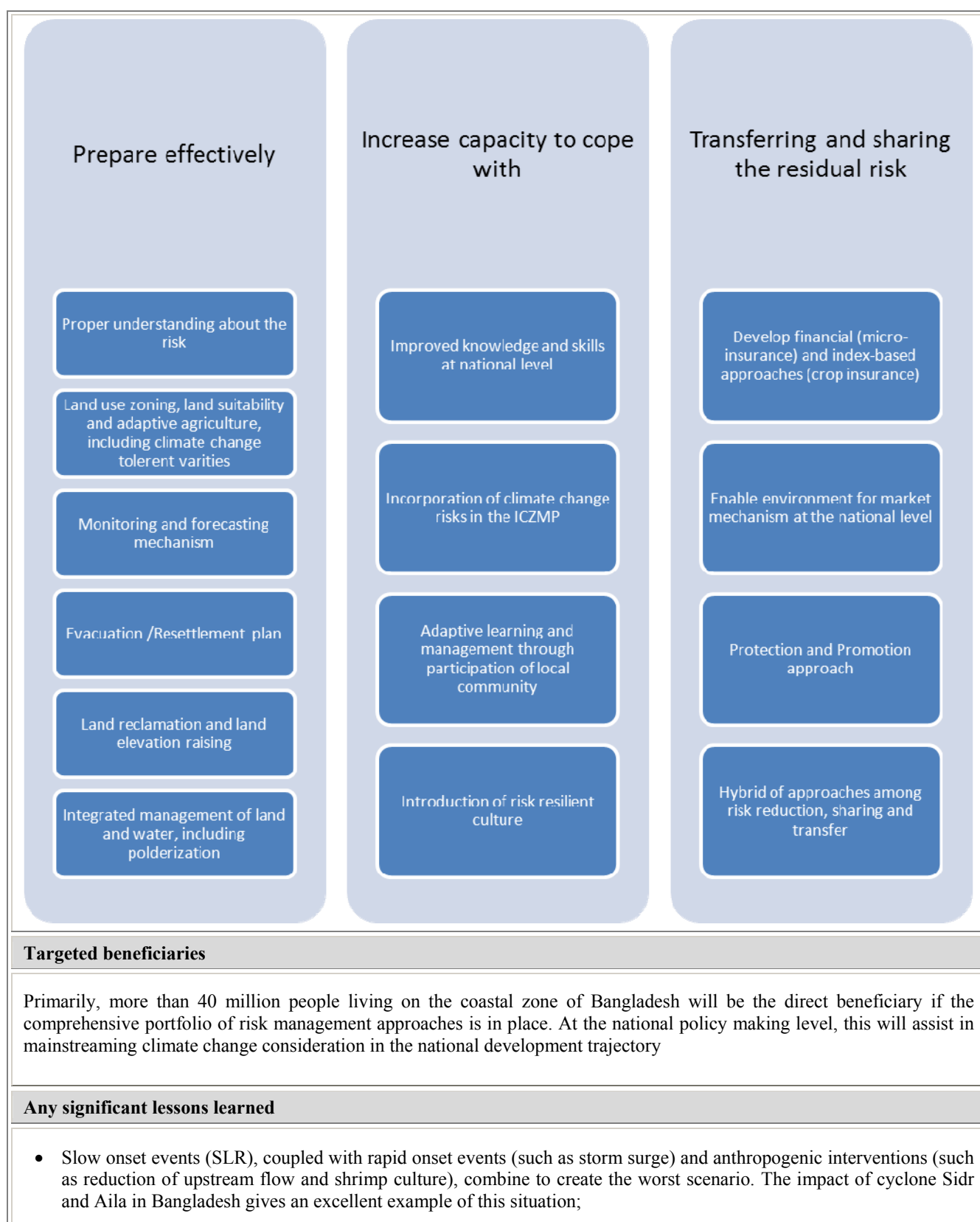
Goal of Approach:

To identify a range of approach for managing the risk of sea level rise at the sub-national level

Input provided by: Mr. Ainun Nishat, BRAC University, Bangladesh

Main elements of the implementation strategy

- Sea level rise is a slow onset event that will result in increase in level of salinity in the coastal waters of low lying deltaic areas. This increase in salinity will also be a slow onset event. However, the level of salinity will be influenced by another rapid onset hydro-meteorological event, namely storm surge. Storm surges push sea water inland. The storm surge at landfall along the coast of Bay of Bengal will thus increase the salinity level temporarily to a very high level, and the depth of the storm surge will determine the distance up to which the salinity level would be transmitted. On the other hand, impact of sea level rise, i.e., extent of permanent inundation and water and soil salinity progression in the coastal zone might be further aggravated due to non-climatic factors or anthropogenic responses like upstream reduction of freshwater inflow and shrimp cultivation. The loss due to sea level rise and associated increase in salinity will be manifested through loss of crop production, loss of biodiversity in the mangrove ecosystem, loss of fish habitat and spawning leading to fish production loss. Thus, risk reduction measures for managing the slow onset events shall not be stand-alone approaches; rather it should be done holistically;
- In the following matrix, different risk reduction and management approaches are briefly elaborated. It should be kept in mind that none of the approaches are stand-alone. Rather, developing the comprehensive risk management portfolio combining different approaches will be the major challenge faced by different countries;
- Novel risk sharing and transfer tools like insurance are in the nascent stage, especially in developing countries like Bangladesh. These financial management tools should be implemented in association with planned adaptation options. Enabling market mechanism will be the key strategic concern for expanding the risk sharing and transfer tools.



- A combination of various risk management options to address all the risks must be worked out, as stand-alone solution for each of the risk separately will not provide a valid solution. Ethiopian experiences of practicing the hybrid approaches combining different financial management tools (like insurance with non-financial risk management tools like social safety net) provide a good example in ground.

Resource requirements

- Knowledge and understanding on risk is the most important factor for proper planning for working out long term options. In this regard, access to downscaled and updated climate change scenarios and other relevant physical science information for risk modeling are urgently required. LDCs and Bangladesh also lack adequate and appropriate human resources and computation resources.
- Bangladesh, a LDC, seriously lacks the financial resources to implement risk management approaches.

Potential for replication or scaling-up

- Can be replicated appropriately in other developing/LDCs with low lying coastal delta.
- Risk reduction approach (prepared effectively) can be replicated in the developed and developing country situations

Goal of Approach:
Objective: to address the potential risk of agricultural production and food security from future climate change Tool: regional climate model, crop model

Input provided by: Mr. Yinlong Xu, CAAS, China

Main elements of the implementation strategy
<ul style="list-style-type: none"> • to employ the regional climate model for downscaling the global climate model's scenario projections; • to use in situ climate observation data for model's validation; • Based on the model's validation, the correction on the generated climate scenarios with gridded climate baseline observation data is done; • to use crop field experimental data for crop models' validation and the determination of genetic coefficients; • to feed the crop models to simulate the changes of crop yield due to future climate change; • to determine the criteria for food security and the risk grade of crop production; • to address the potential risk of crop production and risk of food supply security from the crop models' simulation with the determined criteria and risk grade.
Targeted beneficiaries
<p>Key beneficiaries: policy makers, local authorities, the farmers. Benefits: based on the risk assessment, the high risk areas identified, the risk factors isolated, and the agricultural adaptation strategy is developed.</p>
Any significant lessons learned
<p>The time-series for the observation data is short, especially for the crop field experiment data; and the long-term crop observation station is few, and the matching for the climate observation station and the crop observation station is not well.</p>
Resource requirements
<p>Data needs: high-quality gridded climate data with more variables, especially for solar radiation; more data for crop field experiment. Capacity needs: user-friendly crop models, user-friendly climate scenarios, platform for data exchange. Financial resources: national foundation, international co-operation.</p>
Potential for replication or scaling-up
<p>The methodology could be shared in the South-South cooperation.</p>
Any additional information
<p>The risk assessment on the damage of climate change is just at the beginning stage, the methodology is not completed, and there is a lot of work to do.</p>

Goal of Approach:

Research and monitoring of glaciers, rivers and lakes; providing open exchange of truthful information; supporting national and international experience exchange on good practical approaches for management will strengthen capacity building of countries' governances on climate change related risk reduce and mitigation.

Input provided by: Ms. Lesya Nikoalyeva, Zoï Environment Network

Main elements of the implementation strategy

There are hundreds of mountain lakes that appear and disappear during snow and glacial melt in the Central Asian mountains. GLOFs research and monitoring is a popular scientific adventure and numerous groups (including non-experts) started studying these events. Fragmentary information and incomplete assessments made decision making difficult. Capacity building and cooperation in the region through the information, data and good experience exchange could help in adaptation measures effectively.

Targeted beneficiaries

Taking into account which groups/economy sectors are endangered by glacier lakes and snow melting, the main beneficiaries are:

- Population groups in the mountain villages and downstream cities;
- Mountain enterprises (i.e. mining, hydropower, agriculture etc.);
- Local economies.

Any significant lessons learned

Lessons learned for mining: there are several active and prospective mining enterprises in Central Asia located nearby glaciers. The operational plants for mining enterprises were designed almost 20 years ago and didn't take into full consideration climate change impacts in high mountains. The process of glacier melting and retreat has strong impacts on mountains and mining: rocks are not so stable, they become loose and prone to landslides and glacial lakes formation. The planners didn't consider enough details about current and future mine operations including post-closure life of mines. As a result, industrial safety was jeopardized, so was the condition of mining waste and tailings. The mine planners have to modify recently requirements for infrastructure and mine operations to improve safety.

Lessons learned for hydropower sector: about 90% of power generation in Kyrgyzstan and Tajikistan depends on water flow after glacier and snow melt. All hydropower stations were built more than 30-50 years ago when climate change issues were not well studied and appreciated. Higher temperatures affect melting of glaciers and seasonal snow cover - so they start melting early and the water flow pattern is likely to change in the coming decades. The hydropower stations' infrastructure will have to deal with different pattern of water flow as well as different water demand by downstream users - for example irrigation and peak flow in the main rivers is likely to shift from mid-summer to late spring and early summer. There are still open questions: how to change the regime of operations for hydropower plants and keep downstream users not negatively affected by this change? How to take into consideration new patterns of water supply and demand?

Resource requirements

Kazakhstan and Uzbekistan as more industrialized and economically advanced countries have sufficient resources for monitoring and preventive measures. They may need donor support for experience exchange, know-how, new technologies and modern approaches as well as improving their equipment. Tajikistan and Kyrgyzstan with fewer resources and lesser economic capacity mostly deal with hazards in cases when they appear inevitable or have to deal with their consequences. They need further support from donors for monitoring and risk reduction.

Potential for replication or scaling-up

Central Asia countries have extensive experience, powerful research base and practical projects to show. This experience could potentially be interesting for other countries.

Any additional information

<http://www.ppcr.tj/>

<http://www.mountainhazards2011.com/>

A range of approaches to address loss and damage at the local/sub-national level

Goal of Approach:

The main objective of Afat Vimo (Gujarati word for Disaster Insurance) is the convergence of micromitigation, and microinsurance as a precondition for effective local, low-cost risk transfer. Disaster-affected and poor communities protected under the Afat Vimo. Due to the combination of high exposure to natural hazards and high human vulnerability, South Asia experiences significant losses to disasters perennially, especially communities located in coastal areas of Bay of Bengal. Despite high and steady growth in the country like India, the cycle of disasters and vulnerability deprives many millions of poor of the human development that might have accompanied such growth. India is in top ten of economically affected countries in 2011. The current level of insurance penetration is less than 1 per cent in India for non-life². India's unplanned development and slow development in address the issue of climate change pose a grave threat worldwide. In future the loss will be increase as vulnerability is high and protection mechanism for poor is lacking. The insurance penetration in life, non-life and industry is 4.40, 0.71 and 5.10 respectively in India³.

Afat Vimo (Gujarati word of Disaster Insurance) is a version of microinsurance designed for the poor among vulnerable. It protects people from the impacts of hazards on their assets by providing cash payouts in the aftermath of a disaster. Afat Vimo is an insurance policy/package that is designed to help ensure that natural hazards do not push the poor deeper into poverty. It was initiated in the long-term recovery efforts of AIDMI with Gujarat earthquake-affected community. It was a result from collaboratively development with insurance companies and poor individuals. Later on the product reach out other disaster-affected states of India includes 2004 tsunami-affected Tamil Nadu, 2005 earthquake-affected Jammu and Kashmir and 2007 floods-affected Bihar.

Input provided by: All India Disaster Mitigation Institute, India

Main elements of the implementation strategy

Afat Vimo has arisen under the Regional Risk Transfer Initiative with ProVention Consortium; it builds upon the significant work done on risk identification undertaken by the ProVention Consortium through the Disaster Management Facility and Hazard Management Unit of the World Bank and the International Federation of Red Cross and Red Crescent Societies.

Linkages with national policy or regulatory framework: International initiatives have strengthened the impact of Afat Vimo. The Hyogo Framework for Action has brought attention, discussion, resources, and commitment to disaster risk reduction and to finding opportunities to address it. The Insurance Regulatory and Development Authority also play an important role in the provision of insurance to the poor. In March 2002, the IRDA published a set of regulations applicable to insurance companies operating in India, entitled "Obligations of Insurers to Rural Social Sectors". Essentially, these regulations establish quotas of insurance provision to low-income clients. AIDMI points out to powerful governments and humanitarian donors that disaster microinsurance can work and should be integrated in recovery programmes and argues with giant insurance companies about market potential of disaster insurance in the region. Potential for South Asian market to absorb innovative and affordable micro-insurance products is huge.

Targeted beneficiaries

The Afat Vimo first demonstrated in Bhuj with 2001 earthquake-affected victims and later on expanded to disaster-affected communities at different parts of India.

The current client profile of the Afat Vimo Scheme include:

- small businessmen (cabins for grocery, confectionaries, snacks etc.);
- small vendors (hand carts, vegetables, fruits, plastic utensils etc.);

¹ Source: CRED CRUNCH, February 2012

² Source: Government of India, 13th Finance Commission – 2010-2015

³ Annual Report – 2010-11, IRDA (Insurance Regulatory and Development Authority of India), <http://www.irda.gov.in/>.

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- home based workers (sewing machines, clothes, ‘Bandhani’ weaving materials etc.);
- landless laborers (agriculture laborers, plumbers, carpenter, barber etc.).

The policy covers damages or losses to a very wide range of disasters including earthquake, flood, fire, cyclone, lightening, strike, landslide, et al. (19 types). The product was first sold in April 2004 and so far covering thousands of policyholders. Covered damages and losses include:

- death of the policy holder (who is usually the main earner in the family);
- damage to their house through accident and disaster;
- damage to their house contents through accident and disaster;
- loss of tools, equipment and stock related to livelihood; and
- loss of earning due to accident.

Afat Vimo is offered as a single package with an annual premium of around \$4.00 (including administrative charges) and a total potential benefit of \$1,560 (not necessarily the maximum payout) across the various components of the coverage. Currently, the efforts are in the process to reach out 1000 poor and vulnerable coastal communities of Odisha state in the Afat Vimo.

Any significant lessons learned

The study (Impact Assessment of Disaster Microinsurance for Pro-Poor Risk Management: Evidence from South Asia) was initiated as a part of the Regional Risk Transfer Initiative (RRTI), an effort led by All India Disaster Mitigation Institute (AIDMI) to expand and strengthen microinsurance options for the poor in South Asia. It has been supported through funding from ProVention Consortium and executed in partnership with the International Institute for Applied Systems Analysis (IIASA).

Based on the study following lessons/ recommendations were decided to keep in priority of RRTI of AIDMI and partner agencies.

- Support the growth of financial services such as microinsurance to help the poor meet their needs after disasters;
- Microinsurance is not a panacea for disasters. There is a need to promote long-term disaster risk reduction in conjunction with microinsurance;
- Promote the review of organisations’ claims processes to ensure that money is getting to clients in the most effective and efficient way possible. This includes examination of services to help with claims, support for timely review of claims, and information management of decisions;
- Support disaster microinsurance organisation to reach an increased number of communities that require such products;
- Provide increased understanding of the use of insurance funds as well monitoring of additional borrowing after disasters;
- Promote increased participation by women in disaster microinsurance programmes;
- Utilize the client community to increase awareness and grow. Microinsurance organisations should work to create innovation ways to involve the community in outreach and awareness generation of disaster microinsurance. Client satisfaction is high and an overwhelming majority is ready to refer friends to the programme;
- Ensure that all are being served. Promoting review of products. Ensure that although ‘the poor’ are being served, ‘poorer than the poor’ are not being excluded due to costs and information barriers.

Resource requirements

Currently AIDMI with Concern Worldwide and community organisations are putting joint efforts to reach out vulnerable communities living in coastal areas of Odisha and West Bengal where risk of climate related disasters is high. The majority of communities in these areas are surviving through agriculture labour and/or working in informal sector.

These agencies required resources to take this approach ahead through operational and technical services and advocacy efforts.

Potential for replication or scaling-up

High potential to replicate as the Afat Vimo is combination of life and non-life coverage and design as a risk reduction tool for poor and vulnerable communities. The requirement of such approach is also high as vulnerability in the coastal areas due to climate related risk is already high and increasing.

Based on the past experience where AIDMI replicate the Afat Vimo from Gujarat state to other four states of India with poor and disaster-affected communities notice very high potential for replication and scaling-up this approach where Bay of Bengal is highly relevant due to its high vulnerability from climate related risk.

Low level of insurance coverage in South Asia is an opportunity for the authorities, businesses, and the civil society to promote financing risk reduction and recovery through microinsurance. It is up to the Disaster Risk Reduction actors in South Asia to maximize this one of opportunity to face the climate change.

Goal of Approach:

Combination of structural and non-structural (bioengineering) measures for reduction of risk from flooding/flash flooding

Input provided by: Georgia

Main elements of the implementation strategy

- Creation of maps of flooding/flash flooding-exposed areas along the river-basin;
- Identification of concrete locations and measures (structural (bank fortification, reservoirs), bioengineering measures (plantations, bank terracing, vegetative buffers, bundles and tree revetments) to reduce the risk of flooding/flash flooding with optimal cost-effectiveness;
- Identification of additional measures (legal regulations, building codes, insurance schemes, changes in agricultural practices, awareness-raising campaign etc.) to complement the concrete structural and non-structural measures for reducing the risk;
- Establishment of early warning system for flooding/flash flooding in the river-basin;
- Implementation of the measures.

Targeted beneficiaries

Inhabitants living along the river banks are key beneficiaries from this approach as they will be protected from seasonal floods and non-seasonal flash-floods from the river and its tributaries. Economic damage/human lives losses will be significantly reduced.

Any significant lessons learned

Common practices of river banks fortifying works are less and less effective against CC-related frequent flood/flashfloods. In addition to changes in rainfall patterns, trending towards heavier and longer precipitation, glaciers melting in high mountains (The Caucasus in Georgia's case) causes additional risk of water abundance in rivers taking origin in the mountains, and the risk of overflowing the banks. Fortification of the banks is often little protection and even augments the impacts of flooding.

Complex approach with adding non-structural measures with appropriate legal and awareness-raising measures is needed to reduce the risk of damage and losses from flooding/flash-flooding.

Resource requirements

Hydro-meteorological equipment's (stations, radars, labs with qualified specialists), database are needed. Hydro-meteorological agency should make scientific management and municipalities involved can organize the works using construction firms and local inhabitants in works. Local/regional or national/international resources can be raised for financial support.

Potential for replication or scaling-up

Hydro-meteorological equipment (radar) and EWS installed for one river may be applied for neighboring rivers basins too. The experience may be easily replicated making just specific alterations regarding maps and concrete measures. Including the approach in national plan(s) for flood/flashflood-related disaster risk management may substantially facilitate fund-raising from international sources of funding.

For Any additional information

Combined approach for flood/flashflood risk reduction may also stop land degradation along the rivers and plantation of trees as an adaptation measure will have substantial contribution to GHG emission reduction too. Thus, the approach can have both CC adaptation and mitigation effect.

Goal of Approach:
Plantation of windbreaks for prevention of land degradation and aridization of agricultural soils.
Input provided by: Georgia
Main elements of the implementation strategy
<ul style="list-style-type: none"> • Investigations on trend of soil specific (its fertility, humus, moisture etc.); • Identification of area of windbreaks; • Identification of plant(s) – according to its root system, height, climate etc. , appropriate for the soil specific, wind speed and frequency, soil agricultural purpose(s); • Implementation of the measures.
Targeted beneficiaries
Local farmers owning and managing the cropland.
Any significant lessons learned
Climate Change affecting lands by means of increased temperature and precipitation changes often cause land degradation and in some cases, even desertification. This is related to decrease of agricultural production. Windbreaks, along with irrigation, may be a help to degrading soils in windy areas as winds cause additional impacts on land degradation process. Appropriate plantation and well-identified area for windbreaks may substantially slow or/and stop land degradation process, especially in combination with irrigation, increasing thus agricultural production.
Resource requirements
Scientific exploration of soil, climatic parameters (in trend), capacity in agriculture, land, flora areas. Financial provision for plants and their plantation may be very low, cost-effectiveness thus being high.
Potential for replication or scaling-up
Replication of the approach is quite possible. In neighboring areas (plots) the replication may require no additional explorations. In remote areas the specific of soil and wind should be taken into consideration.
Any additional information
The approach has double profit – from agricultural point of view (increased productiveness) and climate change mitigation because of reduction of GHG emission from degraded soils.

Goal of Approach:
Crop insurance.
To enhance capacity of farmer to be able to manage and hedge risk from extreme weather event using market-based mechanism – the insurance.

Input provided by: Thailand

Main elements of the implementation strategy
<p>Weather-index based crop insurance and crop insurance against flood.</p> <p>Key stakeholders: Ministry of Agriculture, Ministry of Finance, Bank of Agriculture and Cooperative, The General Insurance Association, local insurance companies, international reinsurance companies</p> <p>Some of the insurance schemes are subsidized insurance, which government subsidizes up to 50% of the insurance premium.</p>
Targeted beneficiaries
Rice farmer
Any significant lessons learned
<p>Lack of understanding about concept of risk hedging among farmers is one of the factors that limits the implementation of crop insurance.</p> <p>Other government intervention, i.e. direct compensation scheme, discourage farmer from considering insurance as mechanism to manage and hedge their risk on extreme weather event.</p> <p>Risk pool that is fundamental for premium calculation is still based on national scale only. Moreover, the insurance premium pricing is controlled by international reinsurance company. With almost all of the policies is reinsured with foreign reinsurance company, there is no way to control premium price, at least for the time being.</p> <p>Reinsurance company may not be effective risk sharing mechanism across region, if there is no proper framework to regulate them.</p>
Resource requirements
<p>Need historical data and monitoring system to provide necessary data to estimate crop loss/farm damage from each extreme weather event for risk pool calculation.</p> <p>Need proper monitoring technology to verify claim against crop damage that is more efficient than field survey (in case of crop insurance against damage).</p> <p>Proper communication strategy and education tool to establish and enhance proper understanding on risk hedging for farmer.</p> <p>Subsidized insurance scheme needs substantial amount of fund, which could be beyond the capacity of the country to handle.</p>
Potential for replication or scaling-up

Crop insurance, which is in piloting or experimental phase and focus on rice farming in certain area only, can be scale-up for country-wide coverage and also be implemented with other crops.

The use of market-based mechanism, insurance, can also be expanded to cover other sector against extreme weather event or other climate-induced disaster, especially the micro-insurance scheme for the people who live in the risk prone area.

Any additional information

Risk transfer out of the country through other financial mechanisms, e.g. catastrophe bond, and risk hedging based on other market-based mechanism, e.g. future market, need to be put in place in order to reduce burden of the government and not to overly rely on international reinsurance companies.

Access to Adaptation Fund by developing country to use portion of the fund for subsidized micro insurance for farmer should be put into negotiation agenda under UNFCCC.

Other forms of risk pool and risk sharing mechanism among countries within the region should be studied and established as mechanism to increase capacity of the country in coping with severe weather-related catastrophe.

Risk transfer scheme that would lead to risk sharing among countries in the region, and ultimately risk sharing across the world should be studied as foundation to design proper framework for regional risk pool and global risk pool that can be used to regulate the re-insurance business.

The proper way to use such framework to regulate reinsurance business should be properly studied.

Framework for global risk pool and how developed country (or Annex 1 countries) should bare portion of the climate risk of developing countries should be studied, designed and initiated.

A range of approaches to address loss and damage at the national level

Goal of Approach:
Reducing loss and damage associated with weather and climate extremes through climate risk management (CRM) initiatives
Input provided by: Asian Disaster Preparedness Center (ADPC)
Main elements of the implementation strategy
Climate Forecast Application (CFA) was one of the most successful climate risk management (CRM) initiatives adopted by ADPC since 2003/2004. This was implemented in Indonesia and the Philippines for agriculture and water management applications respectively and later in Bangladesh for strengthening riverine flood forecasting system. CFA addresses both the slow and rapid onset extremes namely, droughts, heavy rains, floods, etc. CFA in Indonesia and the Philippines was basically to introduce seasonal weather forecast information applications in agriculture and water sectors for alarming anticipated droughts and heavy rain spells and thereby taking proactive adaptive measures to reduce disaster risks in both the sectors. Climate Field School concept was introduced under this initiative, which helped to build the capacity of national level agriculture extension officers / water managers who have then trained District level agriculture officers / water managers and then farmers and other stakeholders at the grass route level. The project implemented in Bangladesh {Climate Forecast Applications in Bangladesh (CFAB)} was basically at national level or upstream level effort to increase the lead time of flood forecasting in Gangi and Brahmaputra rivers with Bangladesh Water Development Board. This project was dealt with national level institutes as well as sub-national level institutes to make the effort more sustainable. This was introduced with the existing policy frameworks in the countries.
Targeted beneficiaries
As mentioned beneficiaries of CFA initiatives are national, sub-national and local level stakeholders (national level agriculture officers / water managers, district level agriculture officers, farmers, etc.).
Any significant lessons learned
Climate Field School concept has been very effective as the project implementers have been constantly engaged with stakeholders throughout the project period. Seasonal forecast information is very much essential for the selected sectors (agriculture and water) to have effective impact of such initiatives.
Resource requirements
Reliable seasonal forecast information should be readily made available on real time basis in order to educate them and to convince them how importance of the scientific information for their decision making to reduce disaster risks associated with impending extreme weather events. Sufficient funds should be available to implement this type of project as it involves national, sub-national and local level stakeholders.
Potential for replication or scaling-up
It is very much timely important for replicating this type of projects in other vulnerable countries in the region. For an example, at present, few South Asian countries are experiencing drought condition due to frailer of southwest monsoon rainfall. The countries are now looking for strengthening their seasonal forecasting systems with last mile end-to-end early warning systems. Therefore, there is a great potential to replicate this approach and scaling-up to other areas in the region and also within the implemented countries.
Any additional information
In addition to CFA projects, ADPC has been implementing projects to strengthen existing end-to-end early warning systems for floods, storm surges, etc, which have also contributed to reduce disaster risks and associated loss and damages.

Goal of Approach:

Mainstreaming scientific knowledge into the formulation and implementation of adaptation plans at national and sub-national scales.

Input provided by: Mr. Akio Takemoto, APN Secretariat

Main elements of the implementation strategy

- Encouraging national and local government to formulate and implement national and local adaptation plans by utilizing appropriate scientific and local information;
- (In order to encourage the above approach,) Developing a various tools that are applicable for users with regard to the following themes:
 - High-resolution datasets;
 - Sharing of needs-oriented data;
 - Calibration and validation of regional climate models;
 - Analysis of projections and assessment of uncertainties;
 - Impact, vulnerability, risk and economic assessments;
 - Communication skills with stakeholders for encouraging policy makers to formulate and implement adaptation plans.
- Enhancing networking among international, regional, national and local organization and networks relevant to climate adaptation.

Targeted beneficiaries

National and local policy-makers and practitioners who are responsible for adaptation plans and implementation. They utilize information and knowhow resulting from the above approach.

Any significant lessons learned

There are lack of data and information necessary for planning and implementing adaptation (including disaster risk management), which are applicable by users (policy-makers, practitioners).
 There is a lack of capacity to collect and mine data (to become a good users), lack of high resolution downscaling, lack of common data formats, lack of calibration of regional climate models, etc.
 There is still a lack of information sharing among countries, governments, organization, networks, and stakeholders that are related to climate adaptation.

Resource requirements

Information, data and skills that are specified in “Main elements of the implementing strategy (2) and (3)” as follows:

- High-resolution datasets;
- Sharing of needs-oriented data;
- Calibration and validation of regional climate models;
- Analysis of projections and assessment of uncertainties;
- Impact, vulnerability, risk and economic assessments;
- Communication skills with stakeholders for encouraging policy makers to formulate and implement adaptation plans;
- Partnerships among international, regional, national and local organization and networks relevant to climate adaptation.

Potential for replication or scaling-up

Networking (and partnership) is a key for scaling-up adaptation activities under the condition of limited resources and information in respective countries

Any additional information

The APN is developing a multi-year strategic program to enhance climate adaptation activities in member countries (22 countries in the region) that includes the followings:

- Regional research program that has a capacity building element;
- Capacity building program;
- Activities jointly conducted with other organizations and networks.

Goal of Approach:

The Adapting to Climate Change in China Project (ACCC) aims to improve understanding and assessment of impacts, vulnerability and risk in key sectors in China to reduce exposure to loss and damage by integrating policy and research, national and subnational planning, social and physical science. The project supports evidence-based adaptation planning which takes into account current and future climate change and variability through access to relevant data, tools and information on climate impacts and risks for decision makers.

Input provided by: Ms. Rebecca Nadin, DFID China

Main elements of the implementation strategy

The work is conducted through teams of interdisciplinary researchers across 3 provinces in China (Guangzhou, Inner Mongolia and Ningxia). The results are fed directly into provincial and national decision-making frameworks, including the 5 Year Plans and the National Adaptation Strategy drafting. The ACCC approach focuses on 5 core areas:

Provision of robust impact assessment data through:

- producing higher resolution models but with fewer resources through multi-model approach - use of 5 model subset;
- development of Regional Climate Models and simulations to show the current and expected climate in China, and what the impacts will be on key industries, water resources and disaster risk;
- using and comparing different climate models to better understand uncertainties in China's future climate;
- communicating audience-relevant information to the research community, government departments and other stakeholders, including international sharing of experiences, research results and new methods;
- building capacity to monitor current and projected trends;
- consideration of multiple climate scenarios that explore a range of plausible future climates in order to better reflect the associated uncertainties;

Methods for Assessing Risk and Vulnerability by:

- developing locally appropriate research methods for understanding exposure to loss and damage in key sectors (water, grassland/livestock, disaster risk reduction, agriculture, human health) in each of three case study provinces (Ningxia, Inner Mongolia, and Guangdong);
- developing a methodology to integrate risk assessments into national and provincial level planning processes;
- developing a common definition of vulnerability and risk for all partners:
 - Vulnerability = f (exposure, sensitivity, adaptive capacity);
 - Risk = f (hazard (likelihood and impact), vulnerability).

Understanding and managing risk in development planning by:

- working directly with local and national government and key academic institutions in China for long-lasting partnerships and to bridge the gap between policy and research;
- assessing the effectiveness of current adaptation policies and measures for rapid and slow onset events;
- exploring options for risk transfer, financial mechanisms and institutional arrangements to reduce exposure to loss and damage;
- feeding recommendations into National Adaptation Strategy and sub national planning/policies.

Building Awareness and capacity building by:

- providing support to provincial partners in Ningxia, Inner Mongolia and Guangdong to develop and carry out assessments, analysis and policy formulation;
- developing and agreeing to common methodology and language between academic disciplines;
- writing and running training courses for disaster managers in local governments and communities, teachers and vulnerable populations (migrant workers, women, children and elderly people).

<p>Sharing knowledge and experience by:</p> <ul style="list-style-type: none"> • running activities across government departments in case study provinces and at national level through training workshops, participation in research and other learning platforms; • working with other developing countries under a South-South framework; • presenting key findings, policy recommendations and China's experience at key international conferences; • producing a series of key research highlights and case studies; • publishing a book to capture the overall experience of the project, due in late 2013.
<p>Targeted beneficiaries</p>
<p>Adaptation planners/implementers at national and subnational levels</p>
<p>Any significant lessons learned</p>
<ul style="list-style-type: none"> • Due to highly differential and localized impacts, there are no standardized methods for conducting vulnerability and risk assessments. Appropriate methods must be developed at local level; • Significant challenge in conducting vulnerability and risk assessments across diverse cultural and geographic areas-need for a common definition of vulnerability and risk across sectors; • Quantitative only models of vulnerability and risk can be difficult to construct if data for indicators are missing or of low quality; • Need to integrate quantitative and qualitative methodologies; • Community based vulnerability and risks assessments are time and resource heavy; • Need to develop future socio economic scenarios that combine with climate projections to produce scenarios of future risk for period; • Integration of research ideas and practices across disciplines and diverse array of actors takes time; • Vulnerability and risk assessment become more meaningful and likely to lead to change when they are linked to real life governance and policy processes; • Multi model climate scenario approaches are less resource intensive and allow users to plan for a range of outcomes.
<p>Resource requirements</p>
<ul style="list-style-type: none"> • Quantitative and qualitative data (RCM/community based approaches); • Capacity building around interdisciplinary research collaboration, technical skills for vulnerability/ risk assessments and data collection; • Financial resource – 4 year project (5.8 million GBP).
<p>Potential for replication or scaling-up</p>
<p>The ACCC covers 3 provinces in China. The 3 provinces reflect the diversity of China's economic development, population density, topography and climate. Therefore the methodology and lessons taken from this work could be replicated and shared with other regions and states.</p>

Goal of Approach:**Development of Natural Disaster Risk Atlas (interactive web-based and hardcover Atlas) for Georgia.**

The goal of the approach was to define the risk zones for natural disasters in Georgia and communicate the risks to national, regional and local governments, affected communities as well as interested general public. The objective to develop the Atlas was to help decision-makers consider natural disaster hazards in the development projects (spatial, economical, infrastructure and social) to avoid, prevent and mitigate risks.

Atlas created for Georgia unites international best practices in DRR and DRM. Included maps have been developed according to the modern technologies and methodologies. The regulatory framework for natural disaster risk management in Georgia is rather weak and DRR is poorly addressed in the legislation. Development of the Atlas created the basis for different state and non-state organizations to utilize a common risk assessment methodology and allowed them to identify the risk zones in the country, which facilitated planning process at the national and local levels.

Input provided by: Caucasus Environmental NGO Network (CENN)

Main elements of the implementation strategy

- Combination of international best practice and national expertise;
- Cooperation between State and non-state institutions:
 - Different state agencies that are involved in the disaster risk management issues, participated in the creation of the Atlas. These organizations include: Ministry of Environment (National Environmental Agency), Ministry of Internal Affairs (Emergency Management Department), Ministry of Regional Development and Infrastructure (Coastal Protection Department), and Ministry of Economy and Sustainable Development (Spatial Development Department). Furthermore, different scientific institutes were involved in the development of the Atlas: Ilia State University (Institute of Earth Sciences), Tbilisi State University (Department of Natural Sciences), University of Twente (Faculty of Geoinformation Science and Earth Observation), the Netherlands.
- Application of modern technologies and know-how;
- Work on historic data and information;
- Intensive capacity building and development of national DRR related institutions via training and coaching.

Targeted beneficiaries

The key beneficiaries are the national agencies working on DRM, local authorities responsible for local development, affected communities in risk zones, business sector, general public and other interested parties.

The main benefit of the approach is that the beneficiaries can obtain the information on qualitative dispersion of risks in the space that allows them to plan adequately their activities and implement natural disasters and climate change adapted activities in diverse fields like natural resources management, agriculture, emergency management, infrastructure development.

Any significant lessons learned

Even though the State authorities express their full support and understanding of the importance of the DRR concerns, the allocation of human and financial resources in DRR related activities from the State has been a challenge. The competent authorities do not have baseline information on natural hazards and disasters that would allow them precise and adequate allocation of resources. Furthermore, there has been no analysis conducted on the effects of climate change on natural disasters and, thus, little attention is devoted to prevention and adaptation measures. The main efforts are directed towards responding to natural disasters after they occur.

The process of creation of the Atlas also made it clear that in many cases, the information provided by the State agencies and the local population can differ significantly; therefore, it is important to use the participatory risk assessment approach.

Resource requirements

The data required for creation of the Atlas include: meteorological, hydrological and geological data for the whole country over the last 100 years (some of the historic data is even older); remote sensing data; thematic GIS data (e.g. land cover, soil, geology, climate, administrative territorial division, land use, cadastre data, infrastructure data).

Application of GIS and remote sensing technologies was essential for creation of the Atlas and strengthening the capacity of the representatives of the State agencies (the project partners) who underwent intensive training courses in Georgia and Twente University in the Netherlands.

Creation of the Atlas cost about EUR 200,000 with the largest portions of the amount spent on data collection, analysis and training.

Potential for replication or scaling-up

This type of Atlas is the first effort of similar nature not only in Georgia, but also for all the Post-Soviet Republics. The Atlas was presented at the international conference “Disaster Risk Management Challenge for Development”, where the participants from the Caucasus countries expressed their interest to develop similar Atlas for the whole Caucasus region.

The feedback from local authorities was also important, as they requested to create detailed risks and hazard maps for municipalities. Currently, such maps are being developed for five municipalities in Georgia.

Any additional information

Electronic Web-Atlas can be viewed at the following link: www.drm.cenn.org

Goal of Approach:
<p>Study area: Water and Agriculture sectors of Nepal</p> <p>Objective:</p> <ul style="list-style-type: none"> • Assess the economic impact of climate change under a BAU scenario in the medium- and long-term; • Analyze costs and benefits of various climate compatible development policy options; • Identify, where appropriate, geographical variances in the economic impact of climate change; • Build the capacity of government officials and key stakeholders for carrying out economic assessment of climate change impacts. <p>Expected Outcome:</p> <ul style="list-style-type: none"> • Headline (aggregate) and sectoral estimates of the impacts and economic costs of climate change; • A ranking of climate compatible development policy options, according to their economic efficiency. <p>Study Approach: Stakeholder consultation, field verification, literature review, scenario based impact modelling</p> <p>Tools: Regional Climate Modeling (including the PRECIS model), DSSAT model to look at the agricultural sector, a set of models to consider the effects on hydro-power generation including a long-term power system /generation investment planning model (Valoragua/WASP-4), and econometric models related macroeconomic linkages.</p>

Input provided by: Nepal

Main elements of the implementation strategy
Study being conducted in Nepal is in line with Climate Change Policy 2011 and NAPA document of Nepal. During the study different stakeholders including Ministries, Academia, NGOs, Civil society are involved.
Targeted beneficiaries
The key beneficiary of the study is the government of Nepal. The study will provide a baseline data/information to formulate climate compatible strategy and policy options to effectively address the current and likely adverse impact of climate change. Further, it will help private sectors, whose business is related to the climate sensitive sectors (e.g. water, agriculture) of Nepal.
Any significant lessons learned
The project is at its early stage and lessons are yet to come.
Resource requirements
Assessing the impact of climate change and quantifying the loss and damages requires an exhaustive study and so claims huge financial resources, several data/information and human resources. Specifically, followings are the resource requirements: <ul style="list-style-type: none"> • Availability of appropriate modeling tools; • Generation, availability of baseline data/information; • Availability of multidisciplinary human resources.
Potential for replication or scaling-up
<ul style="list-style-type: none"> • Need resources and field verification; • Exist possibility of scaling-up.

Goal of Approach:
Realization of adaptation measures to climate change at the national level
Input provided by: Ukraine
Main elements of the implementation strategy
<ul style="list-style-type: none"> • Technical upgrading of departments of the State Hydrometeorological Service (It will allow to make: Development of scenarios of climate change conditions in Ukraine on medium-and long-term perspective using data of global and regional models; Development of detailed maps of future climate conditions in Ukraine under different scenarios of climate change using geo-information systems; Conducting of spatial analysis of trends in the frequency and intensity of extreme meteorological events in Ukraine as a result of climate change etc.) • Improving the existing national system of monitoring and forecasting of natural disasters and extreme meteorological phenomena, increasing the number and intensity of which are related to climate change (It will allow to make: Maintenance of scientific and applied studies on the vulnerability of ecological and socio-economic systems to climate change; Conducting of analysis of hydro-ecological river conditions of the Dniester basin, Prut basin and Sirets basin, developing guidance on the definition of their ecological conditions for the preparation of management plans, the use and reproduction of surface water resources; Conducting of spatial analysis of changes in the water regime of surface water pools in Ukraine as a result of climate change etc.) • Increasing of the state afforestation area as a result of reforestation and afforestation on the forest land, creation of protective forest plantations on non-agricultural lands and lands set aside for reforestation, restoration and creation of new forest shelter belts, in addition to natural steppe areas.
Targeted beneficiaries
<p>Key beneficiaries: Local, regional and state government, central executive bodies, State Hydrometeorological Service, forestry.</p> <p>Key benefits:</p> <ul style="list-style-type: none"> • Increasing the adaptability of the population, economies, ecosystems; • Reducing the vulnerability to climate change and the risks of natural disasters and extreme weather phenomena, the number and intensity of which related to climate change; • Creation conditions to avoid possible economic losses from the expected negative effects of climate change or a significant decrease.
Any significant lessons learned
<ul style="list-style-type: none"> • Lack of public awareness in sphere of climate change and lack of specialists in hydrometeorology, forestry and risk assessment leads to slow process and incomprehension of importance of providing the measures addressed to loss and damage associated with climate change impacts; • The providing of any measures without financial, political and regional support is not possible.
Resource requirements
<ul style="list-style-type: none"> • Lack of financial resources (donates, investments, local budgets); • Lack of authentic data for making forecast; • Lack of Qualified specialists in hydrometeorology, forestry, risks from natural disasters; • Lack of observation points of the environment.
Potential for replication or scaling-up
Can be replicated on all territory of Ukraine.

Goal of Approach:**Approach: Central Agency's study of the Economic of Climate Change for Malaysia: Water Resources Sector**

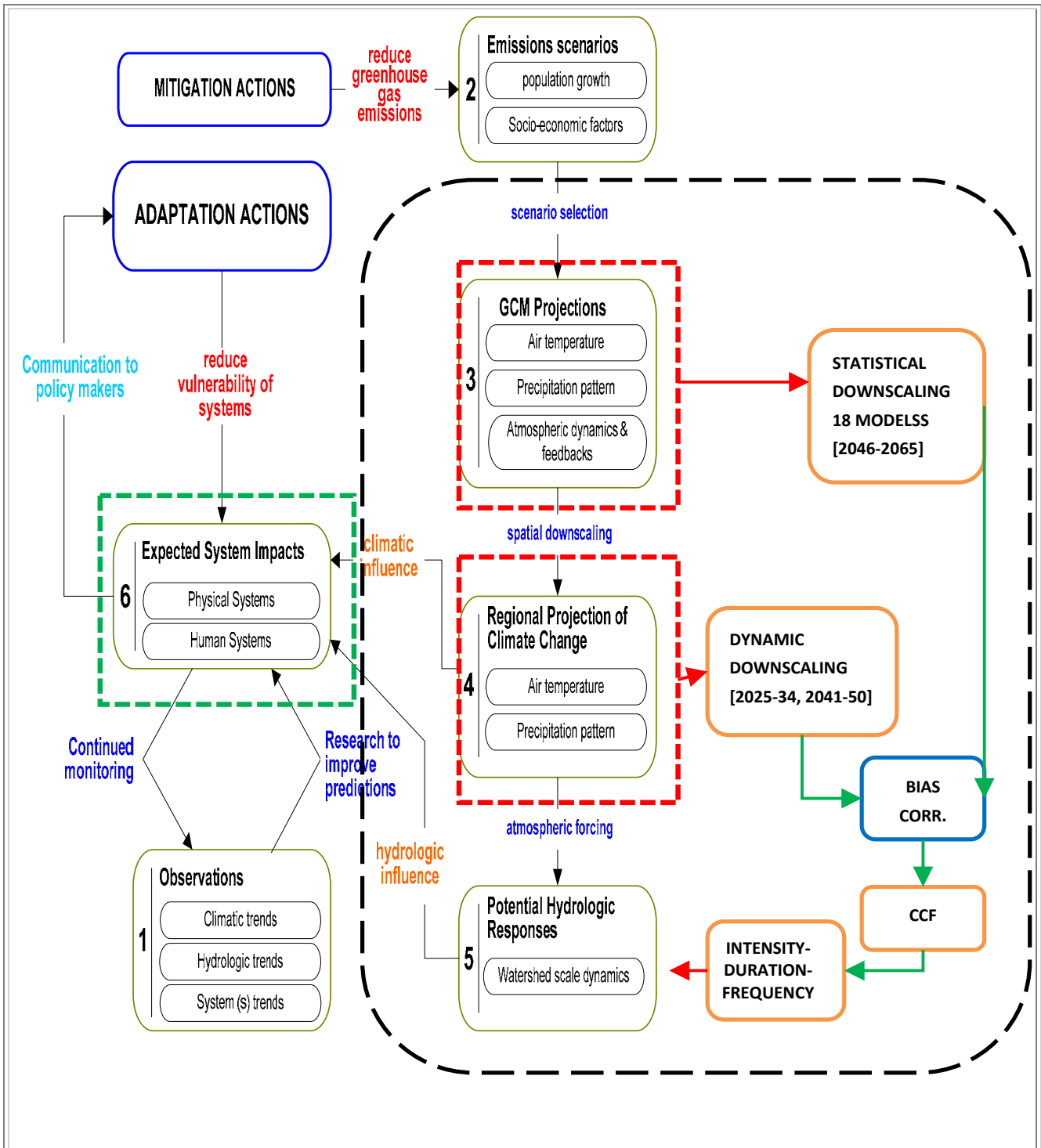
Main Objective: To assess the economics cost and benefits of adaptation measures for the impacts of climate change in the water sector of floods and drought-water supply

Input provided by: Malaysia**Main elements of the implementation strategy**

An analysis of temperature records in Malaysia shows the warming rate of mean surface temperature increased ranging from 0.6°C to 1.2°C per 50 years, consistent with global temperature trends (MMD, 2009). Observations in rainfall intensity for years 2000 to 2007 shows that it exceeds the amount recorded in the years 1971 to 1980 which was previously the highest record. An increase has been observed in annual maximum rainfall intensity of 17% (to 122mm/hr) and 29% (to 133mm/hr) for 1 hour and 3 hour intensity respectively. Under the doubling of atmospheric CO₂, the mean temperature in Malaysia is projected to rise in the range of 1.5°C to 2.0°C, and rainfall depth is to change in the range of -6% to +11%. A climate change modeling and projection study conducted for Malaysia indicates a possible increase in inter-annual and intra-seasonal variability with increased hydrologic extremes, with potential flood and water supply problems (NAHRIM, 2006).

Thus in line with the National Policy on Climate Change, National Water Resources Policy and Malaysia's Second National Communication (NC2) to UNFCCC, in overall, a prerequisite to economic analysis in terms of estimation of cost of adaptation to climate change for water resources sector is to use scientific approach by means of climate change projection data in specific time horizon. The analysis will include key components of climate change projection data such as rainfall, temperature and evapotranspiration based on time horizon to 2050. Due to varying climate change impacts, selecting the most impacted vulnerable areas in one or two locations which is specifically related to drought (water supply) and floods is required.

The main components of the study for the water resources sector are: (1) analysis and detailed modeling for water resources (floods and droughts) to examine structural integrity of existing or near future proposed floods related infrastructures at the protection level of 100-year average recurrence interval (ARI) up to time horizon of 2050; (2) analysis for drought and water supply: to carry out water resources (yield) and water supply modeling which will include projected water demand up to segmented time horizon of 2050; and (3) provide and translate water resources modeling output (data and information) for economic analysis. Derivation of climate change (rainfall) 'load' factor is conducted prior to the analysis and detailed modeling. The framework of climate change adaptation for the water resources study is generalized in the dotted box below:



Targeted beneficiaries

Based on this micro analysis of climate change impacts on the water resources sector, the expected output should be able to generalize the overall impacts and economic implications for the whole country

Any significant lessons learned
<p>(1) Integration thinking between various sectors and stakeholders, and translating hydrological findings for economic analysis, policy and strategy makers are amongst the challenges need to be addressed.</p> <p>(2) to integrate disaster risk management and climate change adaptation at planning and implementation stage so that it can minimize the impacts of water hazards.</p>
Resource requirements
Data used: (1) downscaled projected climate data from Global Climate Models (GCMs) and output projection climate change data from Regional Hydroclimate Model for Peninsular Malaysia (RegHCM) using the IPCC Special Report on Emissions Scenarios (SRES) emissions scenario A1B and historical observed data from Department of Irrigation and Drainage Malaysia (DID); (2) Geospatial data;
Potential for replication or scaling-up
The study/analysis on economic of adaptation to climate change in the water resources sector of floods and droughts-water supply is currently carried out at site specific (local) level. Potentially it could be used for climate change impact analysis, adaptation and economic implications at national level
Any additional information
<p>Reference:</p> <p>MMD. 2009. <i>Scientific Report: Climate Change Scenarios for Malaysia 2001-2090</i>. Malaysian Meteorological Department, Malaysia.</p> <p>NAHRIM. 2006. <i>Study of the Impact of Climate Change on the Hydrologic Regimes and Water Resources of Peninsular Malaysia – Final Report</i>. September 2006.</p>

Goal of Approach:

The ESCAP promotes regional cooperation mechanisms, provides analytical support and technical assistance to address the major issues and policy challenges in the area of disaster risk reduction that also includes capacity development for post-disaster damage and losses assessment. Through policy analysis, knowledge sharing and advocacy, ESCAP encourages and enables the member Countries to use strategically disaster risk reduction for inclusive and sustainable development. Following resolution 64/2, ESCAP promotes regional cooperation for the implementation of the Hyogo Framework of Action (HFA).

ESCAP works on damage and loss assessment as a result of disasters including those related to extreme climate events such as cyclone/typhoon, floods, drought etc. **Post-disaster Damage and Loss Assessment (DaLA)** methodology has been used widely by UN agencies, WB and ADB for recovery and reconstruction. The DaLA methodology has now graduated to multi-sectoral **post-disaster needs assessment (PDNA)** taking into account recovery and reconstruction priorities in short, medium and long term time frame basis.

The objectives of PDNA exercise are:

- to estimate the overall human and socio-economic impact of the disaster in the country as a whole and in the affected areas (Damages, Losses, Micro-Economic Impact and Livelihoods);
- to prepare a PDNA and Recovery Framework Report that will outline the basic Recovery and Reconstruction needs for the affected areas (based on the needs for each economic sectors);
- to incorporate “build back better” principles and Risk Management activities’ cost linked to the recovery and reconstruction efforts proposed; and
- to enhance the capacity of the country team- Government and international agencies- to carry out the human impact assessment, DaLA, and needs assessment and Recovery Framework within the UN-ECLAC PDNA methodology.

Post-Nargis Joint Assessment (PONJA) involving Govt of Myanmar, ASEAN, and UN is an example, followed up after Typhoon Ketsana in Philippines, Vietnam, People’s Democratic Republic Lao, Cambodia and Thailand floods 2011. ESCAP does provide DaLA/PDNA services to the member countries on the request besides offering capacity development opportunities.

Input provided by: Yuicho Ono, Disaster Risk Reduction Section, ESCAP**Main elements of the implementation strategy**

The DaLA missions are led by the respective Governments with the support from development partners and other key stakeholders.

- FROM Government: In many sectors, the Government helps in collecting damage data,. This includes both baseline and damage estimates coming from the field. The assessment team bases their calculations on the Government damage reports and, if needed complement the damage figures with loss estimates.
- FROM Development Partners: Relevant reports from development partners, including the UN are integrated into the PDNA reports. One of the goals of a coordinated PDNA is to develop ONE comprehensive report which covers all sectors and inputs from different agencies..
- Field surveys: The sectoral teams visit a sample of affected areas to cross check the damage data and conduct interviews.
- GIS and remote sensing: The team use of existing satellite imagery of the affected areas.

The PDNA contributes to a joint comprehensive report that brings out the estimate of the effects of the disasters; and the impact on the economy and livelihoods. The needs assessment defines early, medium, and long term recovery and reconstruction requirements including comprehensive disaster risk reduction measures. This joint report provides guidance to the Government, private sector and development partners for sustainable recovery and reconstruction investments that are well coordinated, targeted, and in line with global good practice.

Targeted beneficiaries
The Governments of the disaster affected countries.
Any significant lessons learned
The DaLA/PDNA brings in considerable post-disaster investments including ODA, donors' supports and budgetary allocations from the Government side. However, the capacity of the Governments is quite limited for taking up DaLA/PDNA missions unless there is technical assistance from the development partners.
Resource requirements
The DaLA/PDNA requires funding support besides the technical expertise. There should resources available at the country level to support DaLA/PDNA missions.
Potential for replication or scaling-up
Quite large.

Goal of Approach:**Coping with the impact of climate change on agriculture and food and nutritional security.**

The agricultural sector both affects and is affected by climate change. While it contributes to mitigating it, agriculture affects climate change through the emission of greenhouse gases (GHGs) from croplands and animals. It is affected by loss of agricultural land, salt water intrusion, changes in temperature and rainfall regimes and increasingly severe weather hazards. The key objectives of this priority area are to identify innovative technologies and appropriate practices for coping with the adverse impacts of climate change, and to reduce the contribution of agriculture to GHG emissions while improving its role as a carbon sink. The primary tools will be assistance with policy formulation, technical assistance and capacity building support, advocacy, case studies in selected major food production areas on the impact of climate change, and dissemination of suitable technical options and practices. Expected results include strengthened FAO contribution to policy dialogues and technical cooperation, exchange of information on research and development of climate change-resilient varieties, development of agricultural strategies with strong potential for climate change adaptation and mitigation, identification and promotion of improved crop, aquaculture and livestock production systems and practices contributing to reduced GHG emissions.

Input provided by: FAO Regional Office for Asia and the Pacific**Main elements of the implementation strategy**

- identify innovative technologies and appropriate practices in sub regions for coping with the adverse impacts of climate change on the agricultural sector with a view to protecting and consolidating progress in food security and nutrition; and
- reduce the contribution of agriculture, including livestock and aquaculture and deforestation, to GHG emissions and integrate climate change adaptation and mitigation into strategies for agriculture and rural development.

The primary tools are:

- formulate and mainstream regional, sub regional and national level policies and action plans to reduce agricultural GHG emissions and help the agricultural and rural sector adapt to climate change and contribute more to mitigating its effects;
- advocate that food security and nutrition issues be placed onto the climate-change policy agenda for ensuring efficient and pro-poor responses to emerging risks;
- advocate mainstreaming of the role of trees and forests in climate change adaptation and mitigation measures;
- technical assistance and capacity building support to REIOs and sub regions on suitable practical measures and best practices (including drought resistant varieties of crops, good agricultural practices, improved irrigation, land and water management and sustainable management of forests, fisheries and aquaculture) to reduce GHG emissions and encourage investment in cost-effective adaptation measures;
- case studies in selected major food production areas on the impact of climate change and its implications for food production and agricultural water use;
- dissemination of suitable technical options and practices on climate change adaptation and mitigation in different agriculture sub-sectors in the region;
- technical assistance in developing models and methodologies to assess the impact of bioenergy production systems on food security and nutrition;
- participation in policy and technology knowledge networks to improve understanding of the linkages between animal agriculture and climate change and dissemination of incentive-based mitigation measures;
- technical assistance in assessment of bioenergy policy frameworks to integrate food security and nutrition concerns into bioenergy strategies and action plans;
- provision of technical advice on coastal livelihoods improvement and microfinance programmes for enhanced stakeholder participation in adaptation to climate change; and

<ul style="list-style-type: none"> • support to member countries and regional fishery bodies (RFBs) in strengthening their capacity for integrated monitoring, control and surveillance of climate change impact on rural livelihoods, food security and balanced nutrition.
Targeted beneficiaries
Government (National and Local Level), Farmers
Any significant lessons learned
<p>The results are:</p> <ul style="list-style-type: none"> • strengthened FAO contribution to policy dialogues and technical cooperation at regional, sub regional and national levels on climate change adaptation and mitigation in agriculture, forestry and fisheries; • exchange of information on research and development of salt-, drought- and flood-tolerant varieties of crops for climate change adaptation and mitigation promoted; • political will and commitment to address deforestation and land, water and forest degradation mobilized and confirmed with increased funding for climate change adaptation and mitigation in forestry; • agricultural strategies with strong potential for climate change adaptation and mitigation incorporating sustainable forest, fisheries and crop and livestock husbandry management practices selected and promoted; • improved crop, aquaculture and livestock production systems and practices contributing to GHG reduction identified and promoted; • better understanding and awareness of the impact of climate change on livestock production systems in Asia and the Pacific region and adoption of environment-friendly pro-poor livestock sector policies; • practical technologies and innovations on climate change adaptation and disaster risk reduction identified and widely adopted; and • fishing communities have improved livelihood resilience to problems arising from climate change.
Resource requirements
Institutional setting, Mobilizing funds, Monitoring and evaluation, Technical networking, Partnerships
Potential for replication or scaling-up
<ul style="list-style-type: none"> • Sustainable management of forests and trees is more broadly adopted, leading to reductions in deforestation and forest degradation and increased contributions of forests and trees to improve livelihoods and to contribute to climate change mitigation and adaptation • Environmental values of forests, trees outside forests and forestry are better realized; strategies for conservation of forest biodiversity and genetic resources, climate change mitigation and adaptation, rehabilitation of degraded lands and water and wildlife management are effectively implemented • Countries have strengthened capacities to address emerging environmental challenges, such as climate change and bioenergy

Goal of Approach:

While negotiations on loss and damage are taking place at the global level, loss and damage itself is incurred at the local level. The mechanisms to address loss and damage in the next decade will have to be introduced at the national and sub-national level as it is unlikely that an agreement under the UNFCCC will come in time to meet the needs of the world's climate vulnerable people within that time frame. Thus, the onus is on national and sub-national governments to develop policies that address loss and damage. Bangladesh recognized this after the Work Programme on Loss and Damage was established under the Cancun Agreements and approached the Climate and Development Knowledge Network (CDKN) for help understanding loss and damage and conceptualizing potential mechanisms to address it. From this request the Loss and Damage in Vulnerable Countries Initiative was born. Part of a consortium of organizations implementing the initiative, the International Centre for Climate Change and Development (ICCCAD) has been charged with coordinating a series of studies on loss and damage in the national context of Bangladesh. One of the goals of this comprehensive approach is to enhance national capacity on loss and damage.

Input provided by: Saleemul Huq, International Centre for Climate Change and Development

Main elements of the implementation strategy

The main elements involved in implementing this strategy to increase the national capacity of Bangladesh on loss and damage are as follows:

- Understanding the science through the commissioning of a series of technical papers that will serve as the foundation and inputs of a report that will help policy and decision makers implement policies and programmes that will allow Bangladesh to better address loss and damage to the adverse impacts of climate change.
- Enabling discussions that further ideas on loss and damage through stakeholder workshops, participation in meetings and workshops held by other organizations on the topic and individual meetings with specific stakeholders.
- Examining the legal, policy and institutional aspects of loss and damage at the national level through a study being undertaken by two prominent environmental lawyers in Bangladesh. The study is determining the national context for loss and damage by examining the laws, policies and institutions already in place to address loss and damage and those that would need to be in place in order to implement a mechanism to do so.
- Enhancing the knowledge base at the national level through publications, meetings, workshops and other fora with the aim of engaging a wide range of stakeholders and motivating more research and activities that will help increase the national capacity of Bangladesh in the arena of loss and damage.
- Engaging effectively in international discourse through participation in UNFCCC meetings and engagement with negotiators.

Targeted beneficiaries

The targeted beneficiaries of this approach are researchers, practitioners, decision and policy makers as well as other stakeholders working in the field of climate change.

Any significant lessons learned

Initial lessons include the need to engage stakeholders in discussions about what loss and damage is before proceeding to discussions of potential mechanisms to address loss and damage. Loss and damage is a confusing and often misunderstood topic. Moreover, as this is an emerging issue, new stakeholders are constantly joining the discussions. Thus, it's important to provide a platform that allows a wide range of stakeholders to provide their input into these discussions of what loss and damage is and what it means for Bangladesh.

Resource requirements

ICCCAD's work building Bangladesh's capacity on loss and damage has required minimal resources considering the amount of work that has been accomplished. Much of this can be accounted for by the fact that Bangladesh is what many call a "living laboratory" for research on climate change and development issues. Addressing climate change is a significant priority for the Government of Bangladesh. We have been able to engage with high-level representatives of the Ministry of Environment and Forests as well as the Ministry of Food and Disaster Management. We have also been able to engage highly knowledgeable and skilled researchers approaching climate change research from a variety of disciplines. Many of these individuals have given a significant amount of their time to help us build the national capacity of Bangladesh on loss and damage. That said the work has been facilitated through funds provided by CDKN, which allow a full time coordinator and provide support for the research undertaken in Bangladesh.

Potential for replication or scaling-up

There is significant potential for scaling up this work to not only least developed countries (LDCs), but also to any country interested in building its capacity to understand and address loss and damage. We are engaged with stakeholders from other LDCs and have invited several to attend a workshop in Bangladesh in the fall. The aim of the workshop is to facilitate an exchange of knowledge between those engaged in loss and damage work in Bangladesh and those endeavoring to take on similar work in other LDCs.

Goal of Approach:
<p>Development of the Methodology for Glacial Lake Outburst Flood Risk Assessment</p> <p>Objective: To reduce the risk of glacial lake outburst flood in the Hindu Kush Himalaya (HKH) region</p> <p>Expected Outcome: The methodology developed by ICIMOD is used by the national disaster management authorities of the HKH countries to conduct comprehensive GLOF risk assessment and to plan risk mitigation measures</p>

Input provided by: Arun B. Shrestha, ICIMOD

Main elements of the implementation strategy
<ul style="list-style-type: none"> • Development of step-wise risk assessment method (Figure 1); • Conduct detailed field study of three potentially dangerous glacial lakes; • Pilot the assessment (case studies) for three potentially dangerous glacial lakes; • Communicate the findings with stakeholders: communities at risk, district administrations, central level administrations, policy and decision makers; • Packaging of the methodology and the findings of the case studies; • Outreach activities.
Targeted beneficiaries
<ul style="list-style-type: none"> • Communities living downstream of the potentially dangerous lakes; • Disaster management authorities; • Policy and decision makers; • Scientific community.
Any significant lessons learned
<ul style="list-style-type: none"> • Communication strategy should be developed based on the target beneficiaries; • Communication about risk without possible solutions will not be well received by the communities; • Multi-stakeholder involvement in the methodology development and conduction case study can lead to better products.
Resource requirements
<p><u>Information/data needs:</u></p> <ul style="list-style-type: none"> • Detailed geophysical information about the environment surrounding the glacial lake, particularly the lake damming moraine; • Bathymetric information of the glacial lake; • Detailed topographic information of the river valley; • High resolution satellite imageries; • Detailed socio-economic information of the communities downstream of the glacial lake.

Capacity needs:

- Geophysical investigation;
- Bathymetric survey;
- Topographical survey;
- Dam break modeling;
- Hydrodynamic modeling;
- Socio-economic survey and analysis.

Financial resources:

~US\$100,000 per lake for risk assessment

Potential for replication or scaling-up

- Very high potential for replication;
- Some customization needed.

Any additional information

A GLOF risk mitigation project has been developed for Pakistan based on the findings of the study. This project intends to use the methodology developed by this study.

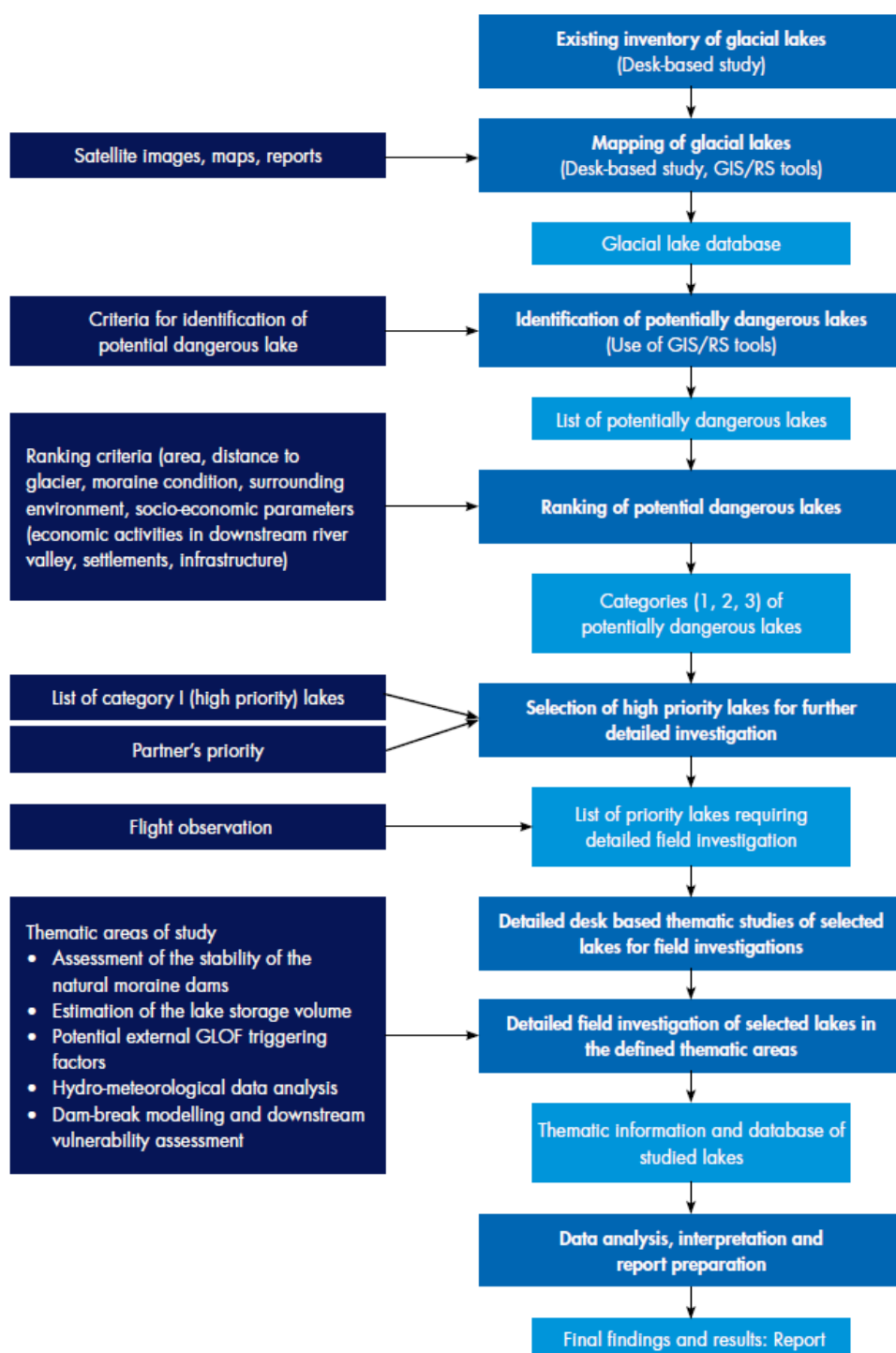


Figure 1: A step-wise methodology for GLOF risk assessment (ICIMOD, 2011)

Goal of Approach:**Glacial Lake Outburst Flood Risk Reduction of Tsho Rolpa Glacial Lake, Nepal**

Objective: To reduce the potential damage due to glacial lake outburst flood (GLOF) from Tsho Rolpa glacial lake in Nepal.

Expected Outcome: The experience gained from the implementation of the project is used by the Government of Nepal and other governments of Himalayan countries to formulate and implement other GLOF risk reduction measures.

Input provided by: Arun B. Shrestha, ICIMOD

Main elements of the implementation strategy

- Assessment of the risk. This involved assessment of the potential triggering factors and estimation of the magnitude of the potential GLOF event and assessing the potential damage;
- Detailed geophysical study of the lake and the downstream environment. This will provide necessary information for the selection of mitigation measures;
- Formulation of the detailed project: In this case the final decision was to construct an open channel through the end moraine. The open channel would release more water compared to the existing natural outlet of the lake and thereby reduce the lake water level by at least 3 m;
- Detailed engineering design, planning and contracting;
- Implementation of the engineering works: The work started in the summer of 1999 and ended in the summer of 2000;
- The planned lake level reduction was achieved in the middle of July 2000;
- Regular monitoring of the functioning of the engineering structure (The measure implemented at Tsho Rolpa is functioning satisfactorily to date).

Targeted beneficiaries

- Communities living downstream of Tsho Rolpa;
- Khimti Hydropower project and other projects in the pipeline;
- Government of Nepal.

Any significant lessons learned

- Community involvement is a must for the success of this project;
- The challenges of working in the harsh high Himalayan environment should be accounted in the planning process;
- Pro-activeness of the government, cooperation of scientific community, positive role of media and support of donor led to the success of the project.

Resource requirementsInformation/data needs:

- Detailed geophysical information about the environment surrounding the glacial lake, particularly the lake damming moraine;
- Bathymetric information of the glacial lake;
- Detailed topographic information of the river valley;

- Human resources availability;
- Logistical information;
- Material costs.

Capacity needs:

- Geophysical investigation;
- Bathymetric survey;
- Topographical survey;
- Engineering construction;
- High altitude survival.

Financial resources:

~US\$ 3 million per lake for risk assessment.

Potential for replication or scaling-up

Potential for replication but adequate site specific customization needed.

Any additional information

A GLOF risk mitigation project is being developed by Ministry of Environment, Nepal with support from UNDP to lower the lake level of Imja glacial lake in Nepal.



Figure 2: Top picture shows the end moraine before construction. The middle picture shows the site during construction and the bottom picture show after lake lowering. The picture in the right shows details of the control structure.

A range of approaches to address loss and damage at the regional and international levels

Goal of Approach:

Project “Reduce vulnerability to extreme floods and climate change in the Dniester river basin” aims to reduce risks from climate change (and specifically flooding) for security by improving the adaptive capacity of Ukraine and the Republic of Moldova. More specifically, the project aims to expand and further strengthen cooperative management in the Dniester River basin to address cross-border management of floods, taking into account both current climate variability and long-term impacts of climate change on flood risks.

Input provided by: Lesya Nikoalyeva, ZOI Environment Network

Main elements of the implementation strategy

Subsequently, the collected data and information will be processed and used as a basis for developing an agreed upon assessment of climate change impacts, with a special focus on flood problems. Modeling and scenario building will help to assess climate change impacts, in particular on the occurrence, frequency and magnitude of extreme floods. Based on the results as well as further information, a vulnerability assessment will be carried out with a special focus on floods in order to identify the most vulnerable areas, economic activities, ecosystems and population groups. Different types of flood risk maps will be produced depending on the needs of the users and the data available i.e. flood hazard maps and vulnerability or risk maps which will help in the prioritization of measures and areas for further action. Based on the results of the vulnerability assessment, further adaptation and especially flood risk reduction measures will be identified, prioritized and planned jointly by the riparian States, including financing aspects.

Moreover the project will support ongoing efforts in the Republic of Moldova and Ukraine to improve monitoring and forecasts of transboundary floods through the strengthening of the joint system for automated flow monitoring and data exchange (4- 6 new automated flow monitoring stations and data exchange infrastructure). Furthermore, capacity-building on flood alerts and flood communication will be provided through a workshop for national and local experts, the production of local early warning plans, and information material for the general population.

Targeted beneficiaries

The project beneficiaries are:

- Countries: Ukraine and Republic of Moldova,
- Plenipotentiaries,
- Dniester III project stakeholders,
- Ministries of Environment in both countries,
- State Water Committees in Ukraine and Moldova.

Any significant lessons learned

The main lessons learned:

- Often, many more activities and data regarding climate change exist upon which the project should build, they need to be identified at the beginning and throughout the project, establishing partnerships with other organizations working on this area is very useful;
- Baseline studies are very important, they should be discussed at stakeholder meetings;

- It is crucial to establish a working group with representatives of the government, the water authorities, academia, NGOs and other experts to oversee the project and promote its results at the national and transboundary level;
- Like in many other river basins, it has been difficult to conclusively single out the impacts of the changing climate upon water resources. Whereas such impacts upon average river flow are relatively clear, the impacts upon extreme (high) flow are much more uncertain;
- Flood risk / hazard assessments for specific areas in the basins are extremely informative tools for preparing the authorities and the population to possible impacts of climate change, but such assessments require elaborated hydrodynamic and cartographic modeling that is time-, data- and resource-consuming;
- It is difficult to promote basin-scale adaptation to climate change where basin management institutions are weak or absent (as is often the case throughout Eastern Europe).

Resource requirements

The project implementation is funded by ENVSEC Initiative that consists of such institutions as UNECE, UNEP, UNDP, REC, NATO as an associated partner. Some tasks of the project require countries' budgetary support for its further implementation.

Potential for replication or scaling-up

The project "Reduce vulnerability to extreme floods and climate change in the Dniester river basin" is implemented in the framework of Transboundary pilot projects on climate change adaptation; among other river basins that are studied there are such basins as Chu Talas, Danube, Dauria, Meuse, Neman, Rhine, Sava. During pilot projects implementation the project partners have possibility for experience exchange on specific approaches.

The project could be applicable for other mountain areas.

Any additional information

<http://www1.unece.org/ehlm/platform/display/ClimateChange/Dniester>
<http://dniester.org>

Goal of Approach:

For the four countries of the Lower Mekong (Cambodia, Lao PDR, Thailand and Vietnam) the aim is to assist national planning bodies to understand and assess the expected impacts of climate change, the interactions with rapid development and the adaptation needs/scopes suited for the Mekong River Basin. The approach to loss and damage estimation and tools developed are prioritized for issues that are of a transboundary nature and those affecting the most vulnerable.

Input provided by: Nguyen Huong Thuy Phan and Anthony Green, Mekong River Commission Secretariat

Main elements of the implementation strategy

The main elements for implementation are:

- Development of Shared Predictive Tools for hydrological changes in river regime due to climate and development scenarios;
- Collection and collation of Impact tools and data including flood/drought damages, fisheries, social and environmental impacts;
- Build capacity in member countries to assess climate change impacts and vulnerabilities, use the available tools and to support pilot adaptations;
- Foster cooperation and provide high quality information to allow climate change adaptation to be integrated into development policies.

The Mekong River Commission works under the mandate of the 1995 Mekong Agreement which defines the scope for joint planning for balanced and socially just development in the Mekong Basin while protecting the environment and maintaining an ecological balance.

Targeted beneficiaries

The most vulnerable people in the basin through member countries planning and development actions.

Any significant lessons learned

The Mekong River Basin is undergoing a rapid change due to development and the risks of climate related damage is increasing. The development of shared predictive tools has been very successful though there is still significant capacity building needed in the less developed countries.

The use of the modeling and assessment tools for climate predictions needs to be streamlined to take advantage of the developments in climate science and to maintain the confidence of decision makers in light of a plethora of predictions and increased understanding of uncertainties for the future by experts that is harder to convey to non-specialists.

The changes expected in the river regime include not only the changes in flow from climate and development (including hydropower) and land use but also changes in the sediment and nutrient regime that will impact on the critically important fisheries sector and more work is needed to understand the changes expects and complex linkages.

Resource requirements

The predictive system for changes in flow has worked well in the past planning for the Basin Development Plan of 2011 but as attention is focused more on the social and environmental impacts, the understanding and data needs increase rapidly. Data that would resolve some of these constraints such as the more advanced elevation models necessary to determine flood thresholds and depths commonly available in developed countries are not available for the Mekong Basin.

There is one modeler for each country working permanently at the MRCS in a support role to the Climate Change and Adaptation Initiative. Collaboration with other regional and international institutes is necessary to access suitable climate predictions for input to the hydrological and hydraulic river models.

Potential for replication or scaling-up

The Mekong River Basin as the 10th largest in the world and with the 3rd largest estuary provides an example for many of the larger river basins extending over more than one country.

Goal of Approach:

The Mangroves for the Future (MFF) initiative was launched in December 2006 in Hin Look Dieu village, Phuket, Thailand by President Clinton in his capacity as UN Special Envoy for Tsunami Recovery and as a strategic and long term response to the continued degradation of coastal ecosystems threatening the livelihoods and security of coastal communities throughout the Indian Ocean Region.

MFF is a regional partnership-led initiative that seeks to effect demonstrable changes and results across four key areas of influence: regional cooperation, national programme support, private sector engagement and community action through knowledge, empowerment, and promoting good governance in coastal areas.

MFF aims to strengthen the environmental sustainability of coastal development, and promote investment of funds and other resources in coastal ecosystem management for sustainable development. MFF initially focused on the countries worst-affected by the Indian Ocean Tsunami; India, Indonesia, Maldives, Seychelles, Sri Lanka, and Thailand. MFF has recently (2010) expanded its geographic scope to also include Pakistan and Viet Nam.

Input provided by: IUCN**Main elements of the implementation strategy**

The Mangroves for the Future (MFF) programme is founded on the premise of partnerships, and its annual work plans are implemented through its institutional partners, as well as other government and non-government stakeholders. MFF is governed by a Regional Steering Committee (RSC), comprising representatives from the MFF 8 Member Countries, core institutional partners (UN agencies, Wetlands International, Care and IUCN), and MFF's main donors. The RSC meets annually to agree on the forward work plan and approves financial allocations for MFF's major activities under the annual work plan.

Directed by the RSC, implementation of the MFF work plans is managed by the MFF Regional Secretariat based in IUCN ARO (Thailand) and by MFF National Coordinators. Where available (India, Pakistan, Sri Lanka, Thailand, and Vietnam) the MFF National Coordinators work through the IUCN country office, otherwise through the UNDP country office (Indonesia and Maldives). In Seychelles, where neither IUCN nor UNDP are represented, the National Coordinator works under direct guidance of the MFF Regional Secretariat. The MFF work plan is implemented mainly through:

- Country office agreements between IUCN ARO and the relevant IUCN/UNDP country office. Two types of agreements are applied, giving: a) support to implementation of the annual work plans of the National Coordinating Body (NCB) in each Member Country, and b) support to implementation of small-sized projects selected jointly by the NCBs and the relevant country office;
- Grants to medium-sized projects based on implementation contracts between IUCN ARO and the grantee organization; And
- Regional initiatives based on agreements between IUCN ARO and the implementing partner organisation as per RSC decision.

It is the RSC that decides on the total amount that can be allocated to the three modes of implementation. Presently, the upper limits for small grant projects, medium grant projects and regional initiatives are USD 25 000, 100 000 and 200 000, respectively.

Targeted beneficiaries

MFF aims at strengthening the resilience of ecosystem dependent coastal communities in its member countries.

Any significant lessons learned

- The overall lesson learned is that effective governance structures and arrangements are interdependent and their interplay is what defines MFF's uniqueness. This system allows MFF to feed into national processes and then bring relevant feedback from them to inform decision making at the regional level. This learning and sharing of experiences is then fed back into national processes in an iterative cycle. Unlike many intergovernmental processes, MFF provides a more "open" model of governance that seems to resonate well within the coastal context, which is characterized by a very broad range of stakeholders and interests/conflicts;

- The MFF countries present great diversity in terms of their geophysical, socio-economic, cultural and political characteristics. Nonetheless, it is possible to discern a number of underlying elements common to the success of many projects in all eight countries, which resulted in positive impacts and indicate good prospects for sustainability. For example, the following attributes featured consistently in many of the MFF small grant projects:
- Choosing local partners with experience and expertise. A key underlying factor in the overall success of the projects was the knowledge, skill and commitment of the local implementing partners. Those who had been in operation for a number of years were more likely to have the skills and dedication required to mobilize the community and other stakeholders in support of the project objectives.
- Partnering with local institutions. Linking the project to existing institutions was seen to help mobilize local capacity and support, including endorsement by local government authorities, and securing their active involvement
- Harnessing the knowledge and capacity to mobilize people. The underlying factor in project success was the knowledge and capacity of local implementers to mobilize the target communities and other important stakeholders including local government officials. Above all, nearly all project implementers were aware, or soon discovered, that involving people in communities and instilling a sense of ownership is perhaps 'the' key factor in achieving a project's objectives. Most projects found approaches or methods to create this all important ownership.
- Ensuring community involvement, providing a clear project vision. Having a clear project vision, and being able to enthuse and motivate stakeholders by demonstrating success relevant to their professional interests, and personal and community economic concerns, were all underlying factors in project success. The projects in Sri Lanka, in particular, is doing an outstanding job of initiating small but sustainable livelihoods projects by using simple technologies and participatory approaches which motivated people's interest and awareness.
- Providing 'open access' to information. Access to information is essential to empower decision-making. To achieve this, projects should make information materials 'open access' (i.e. freely available to copy for non-commercial purposes) and disseminate them available to all interested parties. The project managers reported that information materials were frequently used by groups such as school environmental clubs, environmental NGOs, and youth groups during their various events. If made available, environmental messages in the form of songs, videos, radio spots and other media products will continue to reach audiences for a considerable time to come.
- Return on investment. A high return from quite modest financial investments was a key achievement of the SGF, which provided grants not exceeding USD 25,000 per project (and with many projects receiving much less). By carefully selecting projects with potential for growth, SGF grants served as seed money. Moreover, these grants placed the funds directly in the hands of local organizations, mainly NGOs and CBOs, thereby giving them a sense of official recognition and credibility, as well as the financial resources to make direct investments on behalf of the local communities they represent.
- Endorsement and Recognition. SGF funding also brought a sense of endorsement that raised a project's status and made further development and subsequent applications for funding more likely to succeed. External recognition, in the form of awards or participation in national events, was another powerful motivator that raised the profile of projects. This helped to build confidence and promote wider interest in the project, leading to better dissemination of results.
- Project ownership. As mentioned earlier, creating a sense of ownership among the intended beneficiaries is perhaps 'the' key factor in achieving a project's objectives. The most effective way to promote community involvement and ownership is to demonstrate tangible benefits, so that people can see that the project innovations are both practical and of value; and these attributes will in turn encourage their further participation.
- Changing behaviour. People seldom perceive their activities as harmful to the natural environment and, consequently, it cannot be assumed that they understand the relationship between their environment and their physical and economic well-being. Changing peoples' attitude can be difficult and takes time, as it often involves convincing them to end, or modify, their traditional practices, or learn and apply new skills. The most effective way to change mind sets and practices is to demonstrate tangible benefits from the changes proposed.
- Culture and education. Fundamental to achieving ownership and changing behaviour is to develop a good understanding of the target community itself and how best to impart new knowledge. Taking time to understand local conditions and attitudes is vital to project success, especially when dealing with very traditional communities that may be suspicious of external influences. Educating people requires much thought and perseverance, and educational materials must be well designed to best suit their intended audiences. Involving local religious leaders or school teachers can be an effective way to impart learning to communities.

- Enhancing livelihoods. When introducing potential alternative forms of livelihood, the chances of success will be increased significantly if the proposed activity is in line with local knowledge, skills, and traditions. It is important that beneficiaries have appropriate business skills such as book keeping and marketing. Production must be linked to a market chain to ensure that activities are commercially viable for the producers. Also related to product marketing, consideration of wider social trends may be helpful; for example, the growing preference of consumers for more naturally produced products.
- Ensuring sustainability. Long-term sustainability can only be ensured if project participants are willing to step up and take responsibility. The first step in this process is to empower the target groups and give them space and freedom to operate. This gives people the opportunity and motivation to identify their own problems, formulate and apply their own solutions and, most importantly, to test their own innovations. Engaging young people is an important element in planning for sustainable outcomes.
- Communicating effectively. Notwithstanding some constraints, the SGF projects achieved impressive results regarding communications, generating coverage in the media (print, radio, television and online); they also developed a large range of promotional material, including DVDs, t-shirts, pamphlets, posters and wall calendars, as well as training manuals and other educational materials. However, not enough consideration was given to understanding the profile and information needs the target audiences for these various communication products. It is especially important to provide information in a relevant form.
- Sharing information. It is clear that project managers can learn a great deal from one another if effective information-sharing mechanisms are in place. In addition to exchange visits, where practical, MFF has recognized the need to give consideration to the use of online and social media tools, as a means of facilitating the sharing and exchange of information between projects.
- Building confidence. Confidence is a key element in achieving project success. Project managers and partners are generally sensitive to this intangible quality and often are very good at building confidence among the target beneficiaries, which in turn makes an important contribution to their empowerment. A lesson from this is to attempt to record or even to measure gains in ‘confidence’ as part of its monitoring, learning and evaluation system.
- Engaging the private sector. Although a small number of projects did involve the private sector, the huge potential for corporate involvement was largely untapped. High profile activities, such as mangrove rehabilitation, would seem to offer particularly attractive opportunities for private sector investment. MFF has noted to examine carefully at ways to significantly increase private sector involvement in future projects, including promoting some of the project successes from the SGF projects in Phase 1 to potential private sector partners.

Resource requirements

- Since its inception, MFF has received core programme support from Norad (NOK 30M between 2007-2011) and Sida (SEK 29M between 2006-2010). A Mid-Term Review (MTR) of MFF commissioned by Sida in December 2009 resulted in recommendations for a continuation and modest expansion of MFF into a second phase for which Sida made an additional contribution of SEK 54M during the period 2010-2014. In June 2012, Norad provided another contribution of NOK 7M for the calendar year 2012. In addition Danina is supporting MFF with a grant at 25mill DKK for implementation of a three year project (2012 - 2015) focusing on the potential of Mangroves and other coastal vegetation for climate change adaptation and mitigation in the MFF region

Potential for replication or scaling-up

MFF will continue to reach out to other countries of the region that face similar issues, with an overall aim to promote an integrated ocean wide approach to coastal zone management. While mangroves are used as the flagship ecosystem, MFF addresses all coastal ecosystems. The aim is to provide a vehicle for linking ecosystem conservation to sustainable development goals, thereby addressing the long-term threats to coastal ecosystems and livelihoods. MFF facilitates the building of a collaborative platform for multiple stakeholders to work together regionally and nationally to promote investment in coastal ecosystems as development “infrastructure”.

Goal of Approach:

There is by now a wide array of climate adaptation initiatives in the Asia and the Pacific region. They provide a rich source of information for future adaptation efforts; however, the lessons they produce lack integration, coordination, and synthesis. Such an effort would also probably reveal significant needs to address remaining gaps in understanding that are required to be filled by new research, assessment, and fostering integration, and access to finance and technologies through capacity building. The Asia Pacific Adaptation Network (APAN), a part of the Global Adaptation Network was launched as a regional network in October 2009 and aims to assist the region to build climate resilience of human systems, ecosystems and economies through the mobilization of knowledge and best practices, enhanced institutional capacity and informed decision making processes, and facilitated access to finance and technologies. Loss and damage has been identified as one of the areas for generating knowledge to enhance understating.

Input provided by: APAN

Main elements of the implementation strategy

APAN aims to fulfil its objective through the mobilization and sharing of knowledge and technologies to support adaptation capacity building, policy-setting, planning and practices primarily to the policy makers and national institutions in order to contribute to climate policies at the national level.

The activities of APAN are organized around a framework of knowledge management, capacity development, and adaptation integration.

- Adaptation knowledge management fills gaps when adaptation domains need improved understanding, such as in identifying ways to better manage risk and uncertainty or build resilience, overcome limits etc to adapt, or where there is a need for improved dissemination of existing knowledge;
- Capacity development recognizes the need for both strengthening the knowledge and skills of different actors at different levels to plan, design, implement, and evaluate appropriate adaptation measures, and to acquire financing and technologies for implementation as well as for integrating adaptation into development planning at different levels and in different adaptation domains;
- Adaptation integration covers different adaptation domains or areas of particular concern such as agriculture and food security, water resources, health and sanitation, disaster management, coastal and islands, and mountains etc, and the need for integrating adaptation into policies, strategies, plans and actions.

To be able to effectively coordinate across such a large region, APAN works through a regional hub in collaboration with implementing sub-regional nodes (SRNs) and partner institutions in the Asia Pacific region building upon existing networks and initiatives. Sub-regional nodes designated under APAN coordinate activities with national partner institutes in each sub-region. APAN has five Sub-Regional Nodes covering five sub-regions in Asia-Pacific. SRNs are organisations whose key functions are to lead the implementation of the sub-regional activities of the Network in collaboration with the regional hub and national implementing partners. APAN also has three Thematic Nodes (TNs) on water, agriculture and mountains reflect the current priorities of the region and are composed of organizations with specific expertise on their respective thematic areas.

Targeted beneficiaries

Key beneficiaries include the policy makers, climate change focal points, national and local planners, communities, development partners and the private sector.

Any significant lessons learned

Climate change and its adaptation is a complex issue to deal with, considering the spectrum of problems and the variation in the capacities of the stakeholders in the region to deal with the issues. Huge gaps also exist in the knowledge on climate adaption, not in the availability of the information on adaptation per se but in the translation of the information into usable knowledge and in communicating the right information to the right stakeholder to make an informed decision at the right time. This remains a huge challenge, one that the network is constantly looking to overcome. In the time since the establishment of the network, a lot of effort has been made to facilitate informed decision making on climate adaptation in the region.

One of the key efforts was to establish a database on good adaptation practices to climate change which also includes practices on loss and damage. The database comprises of good practices from across the region outlining different approaches to climate adaptation and loss and damage to climate change. A total of a 135 are currently included in the database. The purpose of the database is to enhance exchange of good practices, help in possible replication of the good practices and ideally, be useful to policy makers. Approximately 20% of the good practices are from Southeast Asia, of which 50% are directly or indirectly related to loss and damage. For Southeast Asia, the good practices compiled are related to Ecosystem-based Adaptation.

Main findings from the good practices in Southeast Asia, point towards the inadequacy of integration of climate change efforts into policies, planning, and operations: Adaptation and mitigation efforts are still largely implemented in isolation, with poor understanding of the interaction and co-dependency on each other to meet global, regional and national climate change goals; an on-going critical need for national and regional decision-makers to prioritise and allocate financial and human resources to address the adverse effects of climate change in all sectors, including the development of proper tools to measure the impacts of adaptation efforts, including actions related to them such as financing, technology transfer and capacity building; public sector funding tends to focus mostly on large-scale infrastructural projects, with small-scale and ‘soft’ interventions usually being poorly executed, monitored and followed-up on; technology transfer must urgently be enhanced, including offering economic incentives to the private sector to change over from unsustainable/non-eco designs: Investments for adaptation by the private sector remain low, with greater emphasis being placed on mitigation and other projects that generate high financial returns and/or are heavily subsidised; the donor field is relatively crowded in the GMS, especially in terms of rural development (education, health, income generation), although substantial opportunities remain for long-term adaptation work and/or linking existing work to on-going climate change adaptation/mitigation efforts; and development of awareness-raising programmes for the public remains an on-going need, together with developing climate change education programmes in school curricula.

Resource requirements

A network such as APAN relies greatly on its partner institutions and its nodes for gathering relevant information. First hand research is also conducted by the network to assess the current trends on adaption, to provide relevant information to the different stakeholders. APAN works through its nodes plus partnerships with other climate networks, INGOs, UN bodies and donors in the region. APAN actively consults with the countries through sub regional consultations and conferences to share its activities, get information from various stakeholders regarding the needs, gaps and trends on adaptation the particular sub region and develops capacity building and knowledge products to address the needs expressed by the countries in the region.

To operate at the regional level, the total budget of APAN is USD 2.5 million per annum. This is not exclusive to the work related to loss and damage but covers all APAN activities including knowledge generation, knowledge management, capacity building, maintenance of the databases on good practices and technologies, website, web portal and APANs publication.

Potential for replication or scaling-up
<p>In the near future, APAN will further build and enhance partnerships, in addition to the network of SRNs and TNs already established under current phase of APAN work. These nodes in turn will link to National Partners or Centres of Excellence in all countries of the region. APAN activities led by thematic nodes will address management challenges that are common to several sub-regions, for example water resources management. Interregional knowledge sharing and collaboration with similar initiatives in other regions, as well as APAN's participation in global processes and dialogues will be facilitated by global partners, such as the Global Adaptation Network (GAN). APAN is also going to conduct a workshop and assessment on loss and damage in each of its sub region this year, pilot training modules in Bangladesh and Cambodia which comprise loss and damage, synthesis the current thinking and prepare policy brief on loss and damage.</p>
Any additional information
<p>APAN along with the Adaptation Knowledge Platform, another initiative on climate adaptation in the region, managed by UNEP, has developed a regional knowledge sharing system that promotes dialogue and improves the exchange of knowledge. The two programmes together maintain a web portal, websites and e-newsletters, and a major climate change regional forum for the region</p>