Assessment and research

The climate variability of the past can no longer be regarded as reliable information for designing water infrastructure. For this reason, IUCN Water and Nature Initiative has been actively contributing to finding and developing methodologies for carrying out vulnerability assessment and adaptation practices that help improve understanding of water-related impacts and resilience to climate change.

For instance, the “Coping with change: Watersheds, seasonal rivers and livelihoods in the Indian Himalayas” project has been instrumental in collecting secondary data on climatic information. These data were gathered from a variety of sources including the Uttarakhand Space Application Centre, the watershed’s Directorate, and the Uttarakhand Forest Department. Also in 2010, all relevant stakeholders were mapped and a database developed for Uttarakhand State and other governmental agencies to use for increasing resilience of local populations. The project has a strong climate change adaptation component in the creation of both a knowledge base on risks to and vulnerability of micro-watersheds in the Himalayas and a trans-Himalayan space for enhanced learning, information sharing and action.

Another instance of collective action stemming from climate change research is the “Water management adaptation in the river Santa watershed: capacity development to cope with climate change” project in Peru. A water situation analysis of the Santa River Basin has been developed in the proposal phase of this project whereas a hydrological and water balance studies will be undertaken during the first quarter of 2011. As a result, both the Mountain Institute in Huarez and other local partners have expressed interest in participating in climate change impact and vulnerability assessments at the subnational level (Ancas region) and will thus support the initiative.

A third study worth mentioning was completed in 2010 for the “Local water governance: catching Nile Water in a Systemic Way” project in Egypt. A preliminary investigation of the climate change impacts on major crops in this area, with the aim to specifically look at the impacts on people’s livelihoods. As part of the study, a survey was carried out to assess the effects of climate change on the cropping patterns especially of small farmers. The data collected show how the climate changes - basically raising temperatures - have in turn led to changes in the crop growth and cultivation time, thus affecting crop yields.

Policy support

Climate change adaptation is a broad societal process that goes beyond transfer of technology. Making water central to any climate change adaptation policies, planning and action is key. At the same time, factoring climate change into water management is a catalyst for innovation and can reinforce reform in the water sector. In order to do so, a blend of strategies that draws on existing approaches should be developed, starting with reconciling water supply and demand and ending with water users that take up an adaptive style of management. IUCN Water and Nature Initiative (WANI) has been active in demonstrating this approach to policy-makers through a number of projects.
In the first phase of WANI IUCN developed the Pangani River Basin Management Project (PRBMP) with the aim of generating technical information and developing participatory forums to strengthen IWRM in the Pangani Basin, including mainstreaming of climate change. A number of scenarios generated from the environmental flows assessment component of the project have been shared to the Pangani River Water Board to guide their decision on development path choices. Following this technical work already completed in the project, focus now switches to stakeholders and government to internalize the concept through wider awareness of the process and deliverables. If decision-makers could select a preferred scenario, then the next sequence of technical work could begin. This would be to help lay out a basin water management plan, which would guide future decisions on water allocations, and a monitoring programme, which would check if the environmental flows are being maintained in the river, and the agreed desired river state is being achieved. These are the steps that are being taken strategically in order to implement the policy and legislative requirements.

With the Pangani example in mind, it is also interesting to look at how IUCN policy work has been progressing in the Huasco River Basin in Chile. This initiative also started as a water dialogue focusing on previous environmental flows experiences, in this case from the broader region of South America. The problem was first identified in 2001 with the privatization of water rights in Chile. In 2005, the water law was slightly modified to include environmental flows requirements. As a consequence, Huasco was selected as the pilot river basin for an environmental flows assessment and a scoping seminar was organized there in 2009. The point of arrival is to mainstream environmental flows assessment in water management practices. This will in turn help improve the water rights system in Chile and thus increase the resilience of other river basins throughout the country.

**Adaptive actions on ground**

Portfolios of measures need to be determined based on their cost-effectiveness in terms of short-term benefits and long-term resilience. Investment in the environment that accompanies development of adaptive institutions is integral to climate change adaptation. Ensuring that production of ecosystem good and services is uninterrupted to protect people and assets from climate extremes and reducing vulnerabilities while creating buffers that target the most vulnerable has been the focus of the.

As for WANI work in Central America, some follow-up actions have been identified as a way forward to further building of resilience in the Tacana watersheds of Guatemala and Mexico. A first step will be engagement of different level institutions to activate the top-down technical support between agencies that has been lacking as well as facilitate bilateral cooperation between the Guatemalan and Mexican sector of the catchment. Other areas of work that have been recognized as shortfalls are media relations and communications, adoption of an integrated approach to landscape management, and reaching out to higher level natural resources managers. There is now an understanding that, if high-profile officials do not make the connection between resource management and ecosystem services, real action towards systemic change is hardly taken. The project area was too small and limited to few areas for increased resilience to be experienced on a significant scale. In addition, the scope of the project could have been wider in terms of stakeholder partnerships. The private sector was included in payments for watershed services schemes in the middle part of the catchment but only for smaller scale holders so
far. In the lower part, large palm and banana tree growers from Guatemala use large amounts of water with no compensation for water retention services upstream. The design of a payment scheme for larger farming is currently under development that implies establishing area-specific payments for environmental services. These are regarded as an important measure to mitigate water risk.

In the Komadugu-Yobe River of North-West Nigeria, two pilot ecosystem and livelihood interventions were conducted in 2010 in the area of river restoration and weed control. The invasion of aquatic weeds, notably *Typha domingensis*, was having a number of consequences for the ecosystem services of one of the sub-basins. Due to the weed and silt blockages flow contributions from tributaries had been practically nil since at least the early 1990s. The use of surface water bodies for fishing and navigation had been hindered and biodiversity decreasing. Instead, the environment was favoring multiplication of vectors of waterborne diseases had been created. Involving about 450 km of the length of the river course, these actions are intended to demonstrate that best IWRM practices had been undertaken to sustain ecosystem services and enhance the livelihoods of the benefiting communities. Owing to this pilot restoration by the IUCN WANI project and other partners such as the Hadejia-Jama’are-Komadugu-Yobe Basin (HJKYB) Trust Fund, a reasonable measure of flow is now reaching Lake Chad as used to be the case in the recent past.

**Awareness and capacity building**

Knowledge, skills and participation in decision-making create the capacity to adapt. Make climate decisions based on public participation and consensus to generate political support. Improve connections between scientists, policy-makers and practitioners at local and global scales to enable better and more rapid sharing of good practices on climate change adaptation.

Another objective of the Pangani River Basin Management Project was to build capacity that enables the District Council and Basin staff to act as a nucleus of expertise for related work in other areas of the country. Implementation of the project has helped mentor Tanzanian experts of environmental flow studies in different institutions including the Ministry of Water and Irrigation, University of Dar es Salaam and PBWB. The process for which PRBMP and other projects such as the Climate Change and Development Project (CCDP) and the Global Water Initiative (GWI) – Tanzania have been exchanging experiences on issues of climate change and water governance has significantly enhanced facilitation skills of partner organizations, basin and local government authority staff. Through the second phase of WANI under way, IUCN is facilitating exchange and learning on experience of Water Users Associations formation nationally and communication of effective strategies to key decision makers at national level to support scaling-up of water governance reform in the Pangani basin to the country-wide level in Tanzania.

As for awareness raising, a public bus, painted with images and messages to encourage water conservation and recycling, is now travelling Fiji’s busiest route, following its launch on World Wetlands Day 2011. In an effort to raise public awareness on environmental issues for Fiji’s main west coast cities Nadi and Lautoka, Fiji’s Department of Environment in partnership with the Land and Water Resources Management (LWRM) launched the bus idea in the city of Lautoka. This is the second painted bus of an
awareness campaign, which also includes billboard signs and stems from the project deliverables of the Nadi Demonstration Project currently being executed by IUCN, Fiji’s Department of Environment, LWRM and SOPAC’s Pacific GEF Integrated Water Resources Management Project. Advocacy is a critical component for the project and the people of Nadi and Lautoka must be made aware of current environmental issues and what they can do to address the issues. Nadi town has experienced flooding events on an average of once every two years with the most recent catastrophic event occurring in January 2009 that caused an estimated FJD100 million in damages. It has been described as the worst flood that the country has ever seen with major impacts on the agriculture and tourism sectors.