



iiied's approach

The International Institute for Environment and Development (iiied) is working with country-based research teams in case study countries to pursue economic analysis using participatory methods. These will bring representatives of major stakeholder groups together and provide a forum for different interests to be considered and balanced. This approach is being termed stakeholder-based Cost Benefit Analysis.

It is hoped that such an approach will support the creation of relevant data sets and allow analysis that takes into account the distribution of costs and benefits in a variety of climate change affected water systems. This should result in better and more equitable adaptation planning with widespread acceptance by affected communities and other stakeholders.

For further general information about this project please email [Muyeye Chambwera](mailto:Muyeye.Chambwera@iiied.org) at [iiied muyeye.chambwera@iiied.org](mailto:Muyeye.Chambwera@iiied.org)

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Economics of adaptation in the water sector

a stakeholder-focused approach



It is widely recognised that climate change will impact upon the water sector of virtually every country in the world. The nature of these impacts are wide-ranging including floods, droughts, saline intrusion and the loss of glaciers. All of these affect the availability of water to households, agriculture, industry and the environment. Adapting to climate change in the water sector is going to be urgently needed in affected countries.

Funding for adaptation has been promised by the international community. There are, however, multiple ways these resources could be used. Complex decisions will have to be made that ensure that resources are used efficiently, but also that the benefits of adaptation measures are equitably distributed between different stakeholder groups.

Furthermore, effective adaptation requires action by multiple stakeholder groups and at different scales. Available actions by householders, for example, are facilitated both by local economic conditions and government policy. Different groups have different priorities and incentives for action. Methods to facilitate effective communication and negotiation between groups will be necessary to avoid the non-engagement of key groups preventing the adaptation of vulnerable groups.

It is inevitable that there will need to be a degree of economic assessment and accountability for adaptation funds from national, bi-lateral and multi-lateral sources. To date, however, the extent of assessment generally demanded by donors has been beyond the capability of most developing countries to fulfil. As such, very little adaptation funding has been successfully transferred to developing countries.

There is an urgent need for new approaches to economic assessment that:

- Balance the need for thoroughness with practicality and speed of assessment.
- Allow the interests of different stakeholders, and especially the poor, to be taken into account.
- Recognise the reality of economic assessment in data sparse regions.
- Recognise the systematic and uncertain nature of assessment of climate change effects.

Project case studies

Project objective

To apply stakeholder-focused economic analyses to selected water adaptation settings of developing countries. Typical stakeholders could be government, private sector, small and large farms, environmental interest groups and sub-categories of those.

Approach

A combination of stakeholder engagement and economic analysis.

Malawi

Lake Chilwa is the 12th largest lake in Africa, lying 100km to the south of Lake Malawi. Rainfall in the catchment is highly variable and the lake expands or contracts with variation in precipitation. Climate change is expected to increase this variability. The lake and its tributaries provide water for agriculture and urban use. In addition the lake is a significant fishery providing livelihoods for up to 6,000 fishermen. The wide number of stakeholders extracting or using water in the catchment creates the potential for conflicts between stakeholder groups. Furthermore, adaptation to water variability often involves shifting between activities, for example agriculture to fishing. Adaptations, therefore, have different implications on costs, benefits and water use between different user groups.

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Bangladesh

Khulna is the third largest city in Bangladesh with a population of around 2 million which is growing at 2% per year. It is low-lying at only 2.5 metres and is vulnerable to floods, from increased rainfall in the river catchment and from tidal surges. Both of these are expected to be exacerbated by climate change through changed precipitation patterns and sea level rise. Drainage infrastructure for the city is currently inadequate to prevent waterlogging at certain times of year. Previous studies have predicted that 58% of the city's population will be vulnerable to flooding by 2050 without significant adaptation investment. Previous studies have not, however, investigated how different stakeholder groups are likely to be affected. Stakeholder-based Cost Benefit Analysis should provide greater understanding of the distributions of costs and benefits of different adaptation plans.

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Morocco

Agriculture is a key sector in Morocco contributing over 80% of rural employment. The majority of the agricultural area is rain-fed and is highly vulnerable to irregular rainfall. Irrigation is one solution to irregular rainfall, however available water resources are also decreasing on average meaning that irrigation systems have to become more efficient in the water that they use. Drip-fed irrigation systems are part of the Green Morocco Plan that could significantly improve water use efficiency compared to traditional surface channel irrigation. Scaling up drip irrigation systems requires action by farmers, government agencies, finance institutions and the private companies that supply the systems. This case study will look at how the interests and objectives of each group can be aligned to allow rapid and large-scale adoption of this technology.

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Bolivia

The cities of La Paz and El Alto are located in the La Paz Valley of the Andes Mountains. The cities also contains several different types of farms. The water supply both for the cities and for agriculture are partially dependent on meltwater from glaciers, which are effectively natural reservoirs. Higher temperatures are causing the glaciers to shrink, increasing the rate of water evaporation and lowering the levels of retained soil moisture. Furthermore, rainfall patterns in the valley are changing. All of these effects significantly change the hydrology of the region and the availability of water to different sectors. The case study will look at how the water system can be adapted to meet the competing needs of urban and rural users.

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Nepal

Rupa Lake is the third largest lake in the Pokhara valley of Nepal. It is situated at an elevation of 600m with an area of 32 km². The Nepal's National Adaptation Programme of Action (NAPA) shows the area is vulnerable to climate change, with landslides a particular concern. The region in general has experienced increased temperature, erratic and intense rainfall over the past 10 years. Livelihoods in the region are predominantly based on agriculture and fisheries. Rupa Lake and its watershed is also a popular tourist destination and has high potential for developing agro-ecotourism. Impacts of climate change are clearly observed in the lake ecosystem through increased siltation. Livelihoods are also affected by climate change as drought is prolonged and rainfall becomes erratic. This causes declined productivity. This case study will develop a stakeholder-focused cost-benefit analysis for Rupa Watershed which is likely to suffer from extreme weather conditions of heavy rainfall, landslide, and increased siltation due to climate change, affecting several water-dependent activities of social, economic and ecological value to a wide range of stakeholders.

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