



Adapting to climate change in the water sector

This summary is based on a forthcoming RiPPLE Working Paper: [Adapting to climate change in the water sector: Assessing the effectiveness of planned adaptation interventions in reducing local level vulnerability](http://www.rippleethiopia.org) soon to be available for download from: www.rippleethiopia.org

This study has assessed the role of planned adaptation interventions in reducing vulnerability to climate change (CC) amongst water based livelihoods.

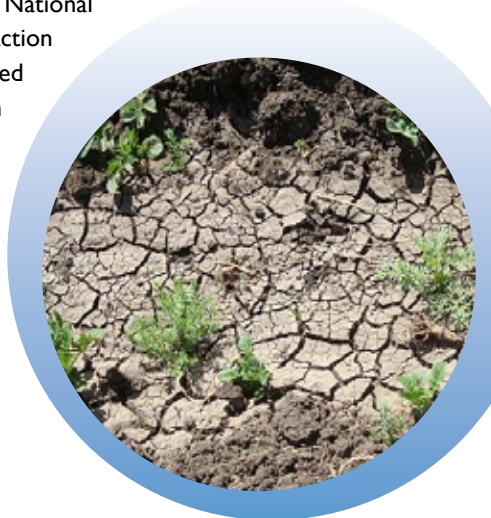
The study team carried out an impact and adaptation assessment. The impact assessment documented local perceptions of climate change and collated secondary data on weather patterns and the impact of climate variability (CV) and CC on the economic and domestic use of water. The adaptation assessment documented local coping strategies to deal with the impact of CV/CC and assessed the effectiveness of planned adaptation interventions in strengthening local coping strategies.

The study was carried out in 4 study sites in the Oromia region, Eastern Ethiopia. Each study site was purposively selected to represent a proxy adaptation intervention, a specific livelihood zone and different wealth groups.

The proxy adaptation interventions studied include:

1. Small scale irrigation schemes;
2. Rangeland Management;
3. Multiple Use Services (MUS); and
4. the Productive Safety Net Programme (PSNP).

The first two have been prioritised as adaptation interventions in the National Adaptation Programme of Action (NAPA), MUS has been identified as climate change adaptation (CCA) intervention for the water sector and PSNP, an example of social protection, is also seen as an effective way to enhance the coping capacity of vulnerable communities under the broader adaptation literature.



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Climate Change Adaptation Highlights

Climate Change Impacts

Local perceptions and secondary data indicate that CC, which includes climate variability and extreme weather events, is and will have the potential to negatively impact water based livelihoods. Livelihoods that do not have a diversified asset base are the most vulnerable to the impacts of climate change; these include poor wealth groups and women.

Perceptions related to CC

Farmers identified rainfall, temperature, soil moisture content, humidity and river runoff as indicators to assess CC. Farmers have perceived a gradual increase in temperature and decrease in soil moisture content, humidity and river runoff. Indicators cited include a shift in wind direction, increase in dust storms, shift in agro-climatic zones, and changes in river flow and depth. Farmers also indicated a shift in rainfall patterns, indicating increased variability (in timing, frequency and amount of rainfall) and the failure of the *belg* (short rainy season) rainfall.

Impacts of CC on the economic and domestic use of water

Economic use of water: Pastoral livelihoods are the most exposed to climate variability and change as they rely on rainfall for a productive rangeland and for watering their livestock. Study findings revealed that an increase in dry spells and temperature has led to the disappearance of key fodder species and to a deterioration in livestock, which in turn decreases their market value. Agro-pastoral livelihoods identified rainfall variability, increased temperatures and loss of soil moisture content as leading to early wilting of seedlings, loss of double cropping, and inability to produce export quality cash crops.

Domestic use of water: A decline in water availability during dry periods has resulted in changing priorities of water use. Women and children were assessed as the most vulnerable to the impacts of CC. Women need to invest more time in collecting water from distant sources and children are often not allowed into school in their dirty uniforms. A decline in the rainfall has also affected the flow of water leading to increased algal contamination of remaining water sources.

Autonomous and Planned Adaptation to Climate Change

Local communities use a range of supply and demand side strategies to cope with climate variability:

Supply Side Coping Strategies: These strategies aim at increasing the supply of water during times of water stress. The study found that richer wealth groups are more able to rely

on supply side interventions as compared to middle and poor income groups. The study also found that a number of supply side interventions, like using donkeys to carry water and shallow well irrigation may increase the capacity to cope with the impacts of CC in the short term, but do not necessarily reduce exposure to CC as they rely on surface water sources.



Demand Side Coping Strategies: These strategies aim at increasing the efficiency of water use during times of water stress. Examples from the study site include: land/soil moisture management practices and setting up water management committees that implement water rationing, cleaning and maintenance of water sources. At a household level, communities prioritise water use favouring cash crops over food crops and cooking over sanitation needs.

Strategies to cope with Extended Weather Events (EWE): Autonomous capacity to cope with EWE was assessed to be minimal. The study identified pastoral migration and asset diversification, which includes livestock and crop diversification and income generating activities, as effective coping mechanisms. Other practices, like sale of assets and distress labour migration were assessed as being negative adaptation strategies as they do not strengthen the asset base of communities. Local communities rely on a number of planned interventions to cope with EWE. These include food aid, cash for labour schemes under the PSNP and access to credit.

Effectiveness of Planned Adaptation Interventions

The study assessed the effectiveness of planned adaptation interventions in terms of their ability to strengthen and develop local coping capacity and their financial and political feasibility. The following recommendations have been highlighted.

Small scale irrigation schemes that are based on surface water sources do create assets for some wealth groups. These enhance the coping capacity but do not reduce exposure to CC impacts. Small scale irrigation schemes based on ground water sources (where it is available and accessible) create and enhance the asset base of communities, build capacity to cope with CC impacts and reduce exposure to CC. Small scale irrigation is a supply



side intervention that is location specific. Issues of equitable access must be taken into account when promoting this option.

Rangeland Management: The introduction of drought resistant fodder species under rangeland management will enhance adaptation amongst pastoral communities. Such measures should be coordinated with measures that enhance access to water resources and protect against extreme weather events.

Productive Safety Net Programme: Targeting of both beneficiary areas and individuals should be carefully undertaken to be able to reach the most vulnerable. Coordination and proper planning are essential so as to start activities on time and avoid overlap with the normal agricultural calendar. PSNP itself needs to be climate proofed.

Multiple Use Services: In order to reduce exposure to CC, MUS investments (as irrigation schemes) should as far as possible rely on groundwater, which does depend less on local recharge. MUS interventions and catchment protection used to be coordinated with overall natural resource management interventions. This requires sectoral coordination and integration while planning, and a well coordinated management system at local level. Hence, organisation and training of beneficiaries and stakeholders is crucial.

Researchers

The team of researchers for this project comprised:

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