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## Poverty-Environment Action *for Sustainable Development Goals*



# POLICY BRIEF

A COST-BENEFIT ANALYSIS OF CLIMATE ADAPTATION  
OPTIONS SUPPORTED BY THE ADAPT PLAN PROJECT



## INTRODUCTION

### Background

The environment plays a very significant role in influencing social and economic development of Malawi. Approximately 80% of Malawians depend on environmental and natural resources (ENR) for their subsistence and household incomes (GoM, 2014). These resources are degraded on account of unsustainable use largely arising from agricultural expansion, inappropriate management practices and low capacity to implement policies. Unsustainable resource use costs Malawi an estimate of US\$191 million, or 5.3% of GDP every year (Yaron et al., 2011).

Poor households with a poverty rate, estimated at 51.5% (World Bank, 2016), depend on ENR for their livelihoods thereby contributing to natural resource degradation. However, sustainable management of natural resources such as land, soil nutrients, forests, water and fisheries could contribute to poverty reduction and building resilience among the rural vulnerable communities. In addition, a sustainably managed and clean environment is essential for human health.

Furthermore, 90% of the Malawi population is dependent on rain-fed agriculture, 60% of whom are food insecure on a year-round basis. Climate sensitive rain-fed agriculture contributes to the national gross domestic and foreign exchange earnings. Climate extremes and weather events severely erode the resilience and adaptive capacity of individuals and communities through declining yields and food insecurity. Apart from inclement changes in temperature and precipitation, the trend in Malawi has also been an increase in weather-related disasters

## KEY MESSAGES

- Interventions that are financially and economically viable have low capital investment and operating costs while producing relatively high returns. However, local communities rarely have access to sufficient financial resources to invest in such enterprises.
- Interventions that are financially not viable but economically efficient have significantly high investment costs compared to their financial returns. However, these interventions have huge social and economic benefits that make them economically efficient.
- Interventions that are neither financially viable nor economically efficient have some input barriers (water scarcity, low quality feed and fingerlings) which make them economically inefficient. Nevertheless, once these barriers are removed, the interventions have the potential to reduce smallholder farmers' vulnerability to climate shocks and stresses.
- The general challenges affecting the performance of interventions are associated with limited access to reliable markets, low prices of produce, lack of storage and processing of produce, and inadequate training in business management, marketing and record keeping.
- The participation of women in community-based interventions provides leverage in closing the gender and productivity gap within the local communities. Consequently, this contributes significantly to the improvement of women's economic status as well as food and nutrition security.



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such as floods and droughts. It is estimated that Malawi loses on average 4.6% of the maize production each year due to droughts and in the southern region where about one-third of the maize is grown, 12% is lost due to flooding (Pauw et al., 2010).

Increased climate variations characterized by dry spells, droughts, floods, and temperature variability, have compounded the stress on the natural resource base. This, in turn, has negative effects on water and irrigation, agriculture, natural resources and energy, thereby aggravating poverty, food insecurity and malnutrition, especially for the already vulnerable populations.

Against this backdrop, the Government of Malawi, with support from Global Environment Facility (GEF)-Least Developed Countries Fund (LDCF) and United Nations Development Programme (UNDP) implemented the Implementing Urgent Adaptation Priorities Through Strengthened Decentralized and National Development Plans (ADAPT-PLAN) project. The project was implemented by the Environmental Affairs Department (EAD) from 2014 to 2019 with the aim of establishing and demonstrating the institutional framework required to mainstream adaptation into development planning at national and local levels in the agriculture, water and forestry sectors in three districts of Nkhata Bay, Ntcheu and Zomba. Its main objective was to reduce the vulnerability of rural communities to the adverse impacts of climate variability and change.

In this regard, the ADAPT PLAN implemented the following interventions: irrigation, fish farming, beekeeping,

livestock production, village savings and loans, fruit production (banana), community bakery, tailoring, water supply, catchment conservation and energy efficient stoves. Realizing that community level interventions supported by government, development partners and NGOs, rarely conduct cost benefit analysis (CBA) to help planners minimize risks and maximize gains for intended beneficiaries, the Ministry of Economic Planning, Development and Public Reforms in collaboration with EAD engaged a consultant to undertake a CBA of ADAPT-PLAN project to assess its impact on livelihoods of intended beneficiaries in a gender disaggregated manner. This brief provides recommendations for effective planning and implementation of community-based Environment and Natural Resources Management (ENRM) projects to ensure the improvement of livelihoods.

A cost benefit analysis (CBA) was carried out to assess the efficiency and impact on community livelihoods of climate adaptation interventions supported by ADAPT- PLAN project in the three project districts. In carrying out the analysis, consultations were made at national, district and community levels. At national level, consultative meetings were held with key stakeholders involved in the design and implementation of the project. At district level, consultations were held with implementing partners and those responsible for project monitoring, while at community level, discussions were held with members of project implementation committee and beneficiaries of the selected interventions. In addition, in-depth interviews were held with some direct project beneficiaries.



**TABLE 1: Disaggregation of interventions based on financial and economic viability**

<b>Financially and economically viable</b>	<b>Financially not viable but economically viable</b>	<b>Financially and economically not viable</b>
Community bakery (Nkhata Bay)	Tailoring (Nkhata Bay)	Solar-powered integrated irrigation scheme (Ntcheu)
Gravity-fed irrigation scheme (Nkhata Bay)	Fish farming (Nkhata Bay, Zomba)	Fish farming (Ntcheu)
Solar-powered irrigation scheme (Zomba)	Catchment conservation (Ntcheu, Zomba)	
Livestock production (Nkhata Bay, Ntcheu and Zomba)	Water supply (boreholes) (Nkhata Bay)	
Beekeeping groups (Nkhata Bay, Ntcheu and Zomba)	Energy efficient cookstoves (Zomba)	
Village savings and loan groups (Nkhata Bay, Ntcheu and Zomba)		
Fruit production (Nkhata Bay)		

## FINDINGS

### Financial and economic viability of interventions

The interventions were aggregated according to their financial and economic performance (Table 1). Some interventions were both financially and economically viable, others were only economically efficient yet some were both financially and economically inefficient.

All interventions that were financially and economically viable had low capital investment and operating costs but produced relatively high returns. Even if interventions are financially viable, they are not sufficiently profitable to motivate community members to invest in the interventions. One challenge is that local communities often do not have

access to sufficient financial resources to make the initial investment. Another is that their personal discount rate may be very high due to, for example, their financial vulnerability. This justifies government and development partners' support for such projects.

The interventions that were financially not viable but economically viable had significantly high investment costs compared to their financial returns. However, these interventions had huge social and economic benefits that made them economically viable. For instance, catchment conservation did not provide immediate financial benefit to members of this intervention. Implementation of interventions that were financially not viable but economically efficient was justified by their social and environmental contributions to communities.



Solar-powered integrated irrigation scheme and fish farming interventions were neither financially nor economically viable. These interventions had some barriers (water scarcity, low quality feed and fingerlings) which made them economically inefficient. However, these interventions have the potential to reduce smallholder farmers' vulnerability to climate change and enhance their livelihoods once their associated barriers are dealt with. These interventions should be supported along with their improvements in design and implementation.

### **Women's participation in interventions**

It was observed that the number of women participating in most of the interventions was higher (59% of the 538 members) than their male counterparts. The participation of women was key to the success of most interventions. This enabled women to have increased access to inputs, time-saving technologies and services thereby closing the gender and productivity gap within the local communities. Consequently, this contributed significantly to the improvement of women's economic status as well as food and nutrition security. Most of the women were also involved in planning and decision-making roles for the interventions.

### **Success factors and limitations influencing the interventions**

The interventions were positively influenced by initial capacity building, commitment of beneficiaries to participate in the intervention, availability of adequate and suitable land, incorporation of the pass on approach, integration of VSL into group interventions, and women and youth involvement. The general challenges affecting the performance

of interventions were associated with limited access to reliable markets, low prices of produce, high cost of inputs, low quality of equipment, lack of storage and processing of produce, inadequate water supply for irrigation and fish farming, and inadequate training in business management, marketing and record keeping. Notwithstanding the challenges, the interventions were successful; and represented good use of public funds in supporting diversified and strengthened livelihoods of vulnerable communities in the project area.

## **POLICY IMPLICATIONS AND RECOMMENDATIONS**

The following policy recommendations are made based on key findings of the analysis:

### **Promoting production related interventions**

All interventions that were financially and economically viable were production related ones except VSLs which were service oriented (Table 1). These interventions had low capital investment and operating costs while producing relatively high returns. However, local communities rarely have access to sufficient financial resources to invest in these enterprises. In improving resilience and livelihoods from a financial and economic perspective, there is, therefore, a need to scale up production related interventions through government and development partners' support for such projects.

### **Supporting catchment conservation interventions**

Catchment conservation interventions were financially not viable but economically



efficient. Catchment conservation does not provide immediate financial benefit to the communities implementing the intervention. Moreover, the environmental benefits are for the general public. Therefore, there is need to provide public financing and incentives to support the implementation of catchment conservation initiatives.

### **Improving yield from fish farming**

Fish farming has high potential to improve community resilience from climate stresses and shocks. Yield from fishponds in Malawi is generally low largely due to the use of recycled fingerlings or fingerling brood stock because they are not able to access affordable and high-quality fingerlings. Similarly, most of the farmers have no access to affordable formulated feed and resort to use of locally sourced manure, rice or maize bran. There is, therefore, a need to incorporate production and use of high-quality fingerlings and fish feed to ensure profitability of the interventions.

### **Improving siting of irrigation water supply systems**

The integrated irrigation scheme was financially and economically not viable, largely due to water scarcity. Siting of the irrigation scheme did not match with aquifer levels and water demand shared among irrigation farming, fish farming and domestic use. Thus, there is need to improve integrated irrigation systems through appropriate siting to match with aquifer and utilisation levels.

### **Promoting value addition and transportation of produce**

Most of the interventions produce perishable products and hence they are sold at highly discounted prices due to

lack of processing, storage, packaging and transportation facilities. There is need to incorporate processing, storage, packaging and transportation facilities in production interventions.

### **Improving access to reliable markets**

Beneficiaries faced challenges in accessing markets for their products. Often, these beneficiaries sold their produce at the farm gate or within the local markets where prices were generally low. The following policy recommendations are made to improve access to reliable market:

Conduct market research at the design and planning stage of the intervention in order to identify reliable markets for the beneficiaries.

Improve road network in hard-to-reach project areas to open up to favourable markets.

Promote certification of produce in order to increase the market access, share and penetration by engaging appropriate institutions such as Malawi Bureau of Standards and Ministry of Trade during the design and implementation phases of the interventions.

### **Enhancing capacity building**

Capacity building was one of the major components that supported the effective implementation of the interventions. However, capacity building largely focused on imparting skills in the implementation of the various interventions. As such some gaps in governance of natural resources management and utilization were noted. In addition, there was no continuity for further training after project completion. The following policy prescriptions are proposed to enhance capacity building:

Promote the continuity of capacity



building to induct new members, refresh and keep members up to date on current practices to ensure effective and sustainable implementation of the interventions.

Conduct training in community-based natural resources management with particular emphasis on sustainable resource utilization and management, benefit sharing processes, and conflict resolution mechanisms to improve natural resources management and governance.

### Linking women's participation to gender gap reduction in agricultural productivity

Most interventions had more women than men. Inclusion of more women provided a dedicated workforce, guaranteed sustainability of the interventions and ensured that a large share of the benefits accrued to women. Mainstreaming women's participation in projects' interventions, particularly those that enhance income, food and social security is critical to the reduction of gender inequalities in agricultural productivity. It also ensures increased share of economic and social gains including worth creation for women.

### Increasing yield through irrigation systems

Although irrigation technologies are generally associated with high capital and operating costs, they significantly increase crop yields. There is a need to:

- Implement irrigation interventions concurrently with improved crop management through the use of fertilizers, early maturing varieties and increased cropping cycles for irrigation farming.
- Provide government and/or development partners' support to irrigation farming due to high establishment costs.

- Promote lower cost irrigation systems such as gravity-fed and solar technologies to decrease the cost of production.

### Provision of incentives to households engaged in catchment conservation

Catchment conservation does not provide immediate financial benefit to communities. Moreover, the environmental benefits are for the general public. Therefore, provide incentives to households that implement catchment conservation to ensure sustainability of the intervention and the general benefit of the community.

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