

Innovative Financial Instruments for Climate Change Adaptation: The Case Study of Kenya Microfinance for Water Service project

Version 4

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LIST OF ABBREVIATIONS AND ACRONYMS

GPOBA	Global Partnership on Output based Aid
FGD	Focus group discussion
OBA	Output based aid
IFC	International Finance corporation
IPCC	Intergovernmental Panel on Climate Change
AFDB	African Development Bank
DFID	Department for International Development
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
WSRB	Water Services Regulatory Board
DCA	Development Credit Authority

FOREWORD

This case study was prepared by the African Centre for Technology Studies (ACTS) as an input to the “Mobilizing Development Finance of Strategic and Scaled-up Investment in Climate Adaptation” research project, which was implemented by the International Institute for Sustainable Development (IISD) in partnership with ACTS in Kenya, Libélula in Peru, and Prakriti Resources Centre in Nepal. Funding for the project was provided by Canada’s International Development Research Centre (IDRC).

The research project explored challenges to scaling up finance for adaptation across different contexts and opportunities to overcome these constraints. One area of focus was innovative financial instruments for adaptation, thus this case study provided detailed insights on how the Kenya Microfinance for Water Service project could be used as a mechanism to channel resources (economic, financial and non-financial) toward adaptation measures. It is one of three case studies that informed an IISD research paper that explored the challenges and opportunities related to the use of innovative financial instruments to scale up financing for adaptation.

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Case Study Summary

This case study is part of a bigger research project - Mobilizing Development Finance for Strategic and Scaled-up Investment in Climate Adaptation implemented by African Centre for Technology Studies (ACTS) and International Institute for Sustainable Development (IISD) with funding from Canada's International Research and Development Centre (IDRC). The three-year (2019-2021) research project aims to address the substantial gap between the amount of financing required by developing countries to meet their adaptation needs and current levels of international investment. The project is being implemented through three workstreams – (a) mainstreaming adaptation in development finance; (b) strengthening national strategies for financing adaptation, and (c) promoting innovative financing instruments for adaptation.

This case study which is aligned to the third workstream on promoting innovative financing instruments for adaptation is based on the Kenya Microfinance for Water service (*'Maji ni Maisha'*) project.

Purpose and objectives

The overall objective of this workstream study was to improve the knowledge of developing countries regarding innovative financial instruments and how they can be used to scale-up investments in adaptation. This was done through a case study titled, "Kenya Microfinance for water service '*Maji ni Maisha'* (water is life) project". The case study selection was informed by the innovative financial structure employed in the project, the availability of data and its wider coverage in terms of the scope.

Methodology

The case study adopted a mixed-methods approach involving a review of secondary data comprising of both published and grey literature as well as primary data collected through key informant interviews with K-rep Bank official, Rural Focus Ltd. and focus group discussions with the project beneficiaries.

Key Findings

The key findings of the study are:

- a) Availability of technical assistance and credit risk mitigation strategies such as credit guarantees can increase the interest of commercial banks to finance adaptation activities or investments, which are normally considered to be pro-poor.
- b) The main success factors for sustainable adaptation projects include having bankable proposals, willingness and the ability of the consumers to pay, affordability, post implementation project management, availability of technical assistance and enabling policies.

- c) The use of Output-Based Aid (OBA) subsidies, combined with other sources of finance, can be leveraged to secure co-financing from the private sector.
- d) The main challenges experienced included implementation delays, capacity to develop bankable proposals, limited capacity of the local commercial banks to manage adaptation project financing, difficulties in tracking adaptation benefits, business model barriers, and context barriers due to gaps in either policy and regulatory frameworks.
- e) This project was rated as highly successful by the K-rep Bank official interviewed. The project supported 35 water projects, mobilised US\$ 1.2 million community equity, loaned US\$ 3.4 million to the projects and granted output-based aid of US\$ 2.8 million. Out of the 35 projects financed, only three defaulted. In addition, the projects yielded a positive rate of return of US\$ 2-10 for every US\$ 1 invested.

Recommendations

The recommendations of this study are:

- a) Adequate capacity building is needed for local commercial banks to handle projects with the nature of project finance.
- b) To enhance sustainability of adaptation projects, there is need to have a dedicated financing facility oriented towards monitoring and evaluation.
- c) Provision of technical assistance to community-based organization is critical to build their capacity to develop bankable proposals that attract financing from the private sector.
- d) There is need to enhance community awareness and interest in adaptation business models.
- e) The lessons learned from this case study can be used for replication and scaling up of the community water projects as well as financing other adaptation projects in other countries.

1.0 INTRODUCTION

1.1 Background to The Case Study

Climate change is one of the major challenges for global sustainable development with experts warning that the most vulnerable populations in the developing countries will face severe threats and suffer disproportionately.

In Kenya, like in most African countries, the impacts of climate change have far-reaching implications across all sectors of the economy due to the dependence of these economies on climate-sensitive activities (GoK, 2010). Low adaptive capacity coupled with high poverty levels increases the vulnerability of the population to adverse effects of climate change.

Kenya faces a number of risks from climate change and extreme weather events such as droughts, floods and storms which have in the past imposed heavy costs on Kenya's economy. Climate projections indicate that this situation will continue in the future and will take a toll on the country's development agenda. In fact, studies estimate the direct costs of climate damage, if left unabated, could potentially amount to between 1 and 2 billion US dollars annually by the year 2030 (Kebede *et al.*, 2012), and considerably greater if indirect costs are included. To address these risks, Kenya has put in place policies, legislation and strategic climate adaptation and mitigation plans: the National Climate Change Response Strategy (2010); the Climate Change Act (2016); the National Climate Change Framework Policy (2018); the Green Economy Strategy and Implementation Plan (2016-2030); the National Climate Finance Policy (2018); the Disaster Risk Management Policy (2017); the National Climate Change Action Plan (2018- 2022); and the Disaster Risk Financing Strategy (2018 – 2022). These policies seek to enhance the country's ability to respond to climate change effectively. A crucial element in climate change response mechanisms to achieve Kenya's vision for low carbon emission and a climate-resilient economy is climate finance for both adaptation and mitigation. The scarcity of domestic public and private resources presents the need for developing countries to have in place strategies for mobilizing resources to adequately address adaptation needs.

1.2 Problem Statement

Adaptation is one of the society's primary options for dealing with climate change. However, significant resources and coordinated efforts among different stakeholders including the private sector are required to finance adaptation actions.

Although adaptation is prioritized in many African countries, financing adaptation actions in Kenya face more challenges compared to financing mitigation actions. For example, in 2018, only 11.7 % of climate finance in Kenya was channeled towards climate adaptation actions, which is quite a contrast considering adaptation is a priority in Kenya's NDC (Odhengo *et al.*, 2021).

Public finance is considered crucial in implementation of adaptation efforts, while private sector sources of funding are required to supplement and close the adaptation funding gap in light of the limited public resources (CIF, 2016). However, participation of the private sector in adaptation financing is still relatively low for a variety of reasons due to concerns on bankability, limited experience in project finance, high risks of investments and lack of awareness (Druce, *et al.*, 2019). Other risks include limited institutional capacities to develop bankable proposals for projects; and

limited participation by both domestic banks and institutional investors in the necessary infrastructure, green or otherwise (GoK, 2019). Specifically, some of the barriers affecting adaptation financing in the Kenyan water sector include:

- i) Market-specific barriers: the free-rider problem limits investment in water resources management;
- ii) Investment barriers: characterized by bureaucracy, corruption and sometimes political instability;
- iii) Large upfront costs associated with water infrastructure projects; and
- iv) High incidences of non-revenue water, which affects the profitability of the water services sector hence making it less attractive for the potential private investors.

Limited participation of the private sector in financing adaptation due to the aforementioned issues presents the need to create awareness on the existing opportunities on the use of innovative financial instruments beyond the traditional financing approaches.

Innovative financing can be explored with the aim of overcoming common risks, closing market gaps and addressing aspects that hinder the private sector from financing adaptation actions.

1.3 Selection of the case study

The following five projects were evaluated based on the guidelines outlined in the project research protocol:

- i. Qwetu student housing;
- ii. Improved water economics in sub-catchments of Kenya (IWESK);
- iii. Kenya Microfinance for Water Service *Maji ni Maisha'* (water is life) Project;
- iv. Adaptation benefit mechanism;
- v. Potential contribution of geothermal energy to climate change adaptation-a case study of the arid and semi-arid eastern Baringo lowlands, Kenya.

After a scoping review of the above, the Kenya Microfinance Water Service *'Maji ni Maisha'* (water is life) project was selected for the case study because of its innovative financial structure which involved blending of commercial financing, community equity and output based aid subsidies, availability of data and its wider coverage in terms of the scope.

1.4 Rationale of the Case study

Water plays a key role in attaining the country's development goals as it is a vital component in various economic activities such as agriculture, energy, industrialisation and tourism (Ondingo *et al.*, 2018). According to previous research, only about 56% of Kenya's population have access to safe and clean supply of water (Ondingo *et al.*, 2018).

Domestic water demand as well as industrial and agricultural uses of water have been on the rise due to the rapid population growth, urbanization, water pollution and climate change, all which pose a risk to the limited water resources.

Water scarcity in Kenya is more pronounced in the rural areas, more so in the arid and semi-arid areas which make up 80% of the land. Reports indicate that residents in the rural areas have to travel upto 12 km to access water that is sometimes not even fit for human consumption (Ondingo *et al.*, 2018). The insufficient coverage of water services in rural areas is linked to financial and administration challenges in the water sector unlike urban water supply schemes which are aided by large economies of scale and are therefore able to cover their operation and maintenance costs (Chepyegon *et al.*, 2018).

Community based water service providers (GoK, 2008) are quite significant in enhancing accessibility of water supply in the rural and peri-urban areas to meet the demand. However, these water providers encounter challenges in their attempt to increase accessibility of water due to limited management capacity, low revenues, as well as poor water infrastructure within the community-based facilities mainly due to underinvestment in maintenance and rehabilitation. Historically, the rural water sector has often received limited funding, with the available funding primarily focused on providing water to the poor or construction of new piped systems with no funds left to improve existing water infrastructure systems (Virjee, 2009). Furthermore, local banks also tend to shy away from such investments due to the long-term nature of infrastructure projects, difficulty in translating any 'climate-proofing' benefits into the cash-flows and limited experience and information gaps (UNEP,2014).

The Kenya microfinance water service pilot project was identified to address some of the aforementioned challenges to lending of water projects. The pilot project, targeting 21 community water sub-projects, began in 2006 -2010 with the aim of building the capacity of local communities to develop or improve their water infrastructure through community equity contributions, commercial financing and output-based aid in form of subsidies. The national scaling up of the project later began from 2011-2013(GPOBA, 2015). The target group was low-income earners as well as those residing in the ASAL regions who also tend to be the most vulnerable to the impacts of climate change such as drought. The poor water-related infrastructure in the project areas of the case study compounded the vulnerability of the communities to droughts (World Bank, n.d.).

Although the project document does not reference the project as climate change adaptation, the project was geared towards improving resilience and enhancing the adaptive capacity of communities against the impacts of climate change by improving and developing water infrastructure to enhance water supply within the communities.

1.5 Objective of the Study

The overall objective of this study was to improve knowledge on the use of innovative financial instruments as a strategy for enhancing mobilisation of the private sector to finance adaptation projects in developing countries. Specifically, the study set out to:

- a. Document the financing structure of the case study project;
- b. Analyse and document the successes and challenges of the project;
- c. Make appropriate recommendations for replication and upscaling.

The study objectives sought to answer the following research questions:

- i. Which innovative financial instruments have the greatest potential to scale up financing for adaptation, including by crowding in private sector investment?
- ii. What are the conditions of the specific innovative financial instruments?
- iii. What were the success factors, challenges and opportunities associated with use of specific innovative financial instruments suitable for financing adaptation?

1.6 Methodology

The study draws from both primary qualitative data and secondary data. Primary data was collected through interviews and focus group discussions with key stakeholders under the 'Maji ni Maisha' (water is life) project. Online interviews were undertaken with 2 officials from K-rep Bank and Rural Focus Ltd who were involved in the implementation of the project. Reference to contributions by the bank official is denoted by the label BIR (Bank Interview Respondent) while references to contributions by Rural Focus Official is denoted as SOR (Support Organisation Respondent). Focus group discussions on the other hand were undertaken with the management and water users of Mt. Kenya Buuri water project and Kiamumbi water project. (See Figures 1)

Secondary data on the other hand, was obtained from published and grey literature as well as from online archives of the World Bank¹ and K-rep bank.²

1.7 Adaptation context of the project

Kenya has a tropical climate with a bimodal rainfall season. Climate variability in Kenya is influenced by the Inter-Tropical convergence zone (ITCZ) and the El Nino Southern Oscillation. Monsoon winds, subtropical high-pressure systems; easterly/westerly waves, tropical cyclones are other factors that influence inter annual, seasonal and monthly variability of rainfall in Kenya (Ogwang *et al.*, 2014).

Africa has been experiencing a warming trend since the 1960s (IPCC, 2014). Kenya's climate has been no exception to this and past studies (Funk *et al.*, 2010; GoK, 2010) indicate that the observed and projected temperature in the country has continued to rise. Kenya's meteorological department has projected a rise of the mean annual temperature by 0.5°C - 1.5°C by 2030. Fluctuations in precipitation has been observed with less rainfall observed in the March-April-May (MAM) season while the

Figure 1: Focus group discussions for the two water projects studied



¹ https://www.gpoba.org/sites/gpoba/files/Docs/CompletionReport_Kenya_Microfinance.pdf

² http://www.wsp.org/sites/wsp.org/files/publications/Maji_ni_Maisha_HandBook.pdf.9-

October-November-December (OND) season has continued to experience enhanced rainfall patterns (Ayugi et al.,2016).

The variability in precipitation patterns and the increased warming will increase the variability of the natural flow of water in space and time thus affecting supply of water to vulnerable households in most parts of the country. According to Water Resource Management Authority (WARMA), Kenya is classified as a water scarce country with 650m³ per capita water availability per annum which is in fact below the global benchmark of 1000m³ (GoK,2008).

Specifically, climate change is expected to exacerbate the water scarcity in the country of which 80% of the total land area are classified as arid and semi-arid lands (ASALs). The annual rainfall varies between 150 mm and 550 mm in arid areas and between 550 mm and 850 mm per year in semi-arid areas. Throughout the year, temperatures are high, with high evapo-transpiration rates (Ministry of Devolution and ASALs, n.d.). Figure 2 shows the rainfall distribution map of Kenya.

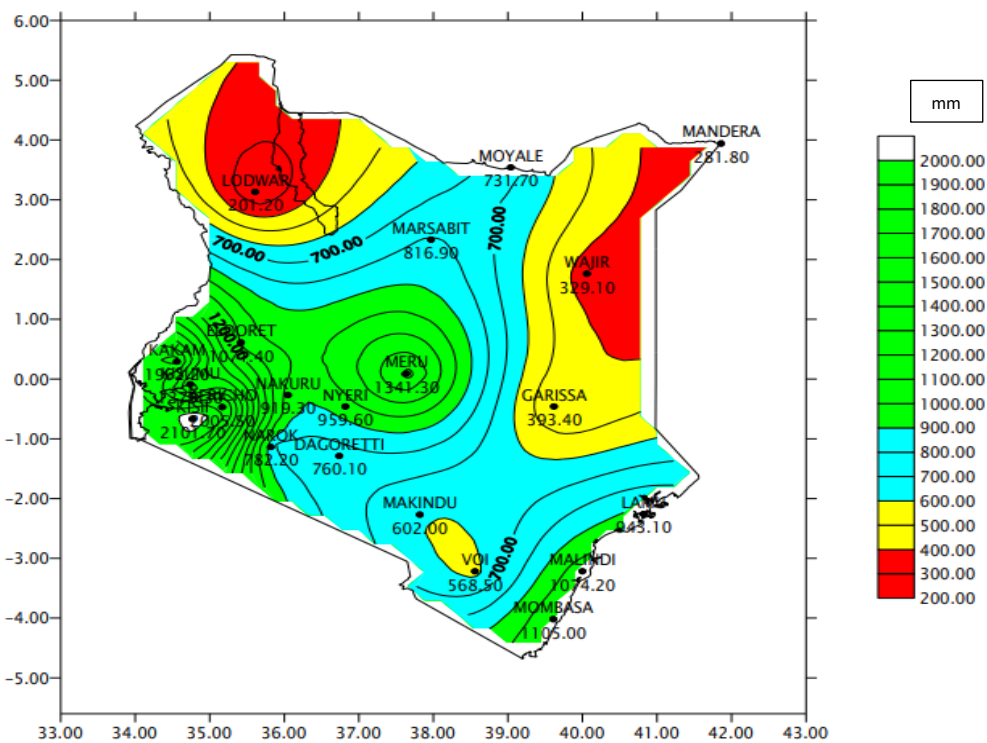


Figure 2: Rainfall Distribution Map of Kenya

Source: Kenya Meteorological Department (2017), Climate Change Risks.

Half of the project sites are located in arid and semi-arid regions of the country as shown in figure 3 below. These regions tend to receive low amounts of precipitation and the frequency and severity of climate events such as drought is likely to worsen. This situation, coupled with high poverty levels, is likely to limit the adaptive capacity of the population living in these areas.

In view of the above, enhancing the adaptive capacity of the vulnerable population in these project sites by improving access to water for household use is critical to increase their resilience to the impacts of climate change such as droughts.

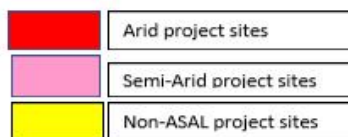
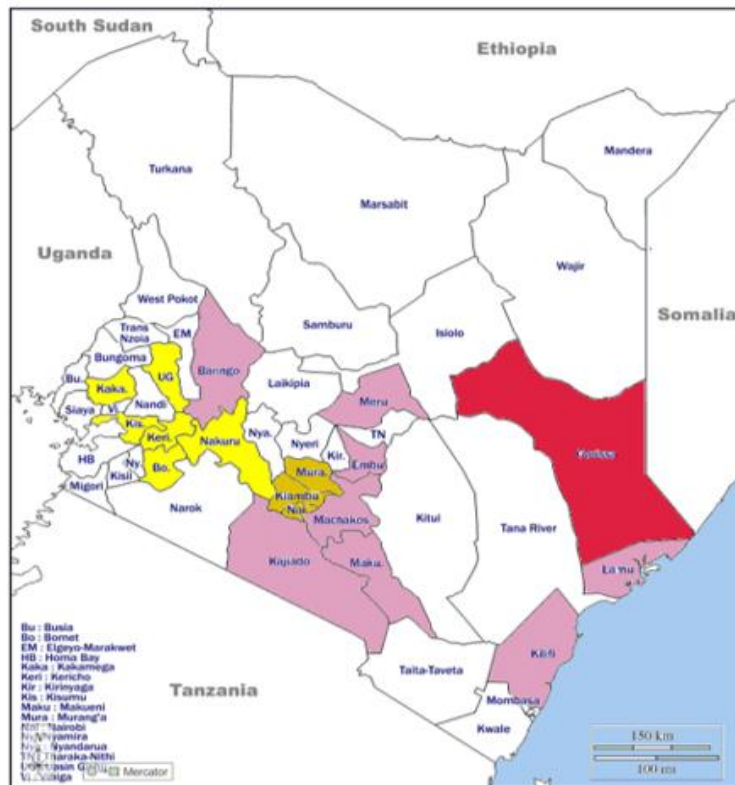


Figure 3: Project sites for the Kenya Microfinance Water Service Project

Source: Authors based on The World Bank Group. (2014)

2.0 PROJECT DESCRIPTION

2.1 Fundraising and Financial design

2.1.1 Project Planning

A Country Assistance Strategy (CAS) for Kenya was issued by World Bank in 2004 to mobilise private sector investment in infrastructure and build capacity of microfinance institutions to expand their services. The CAS is an important country-level document of the World Bank as it sets out the indicative level and type of assistance that will be provided to a country by the World Bank Group, usually for a period of four years. The CAS links the development priorities of a country with selected support from the World Bank Group (GPOBA,2015).

To align to the goals of the Country Assistance Strategy (2004) the World Bank in collaboration with the Ministry of Water and Irrigation, the Nairobi Water Services Board and K-Rep Bank piloted the

Water and Sanitation programme to fund community managed water schemes. The goal of the programme was to explore structures under which a commercial financier would be interested in providing loans to community-owned water providers. Several limitations were identified during this time. These included limited collateral, capacity limitations, and affordability of capital investments. This then stimulated the launch of a pilot project under the *Maji ni Maisha* (water is life) programme in 2006 to address the above limitations and facilitate access to finance by community water providers to aid in enhancing access to water and managing water schemes. Before the approval of the project, substantial planning work was carried out, notably: (a) creation of credit evaluation and appraisal tools for community-managed piping systems; (b) industry evaluation of the funding demand for such schemes in Kenya; (c) an evaluation of the capacity of firms to provide specific schemes with business support services; and (d) assessment of sub-projects for appraisal and loan approval. The project was implemented between 2007 and 2013.

2.1.2 Financial Structure and Governance

The following is a brief description of the roles of the institutions which were involved in the project:

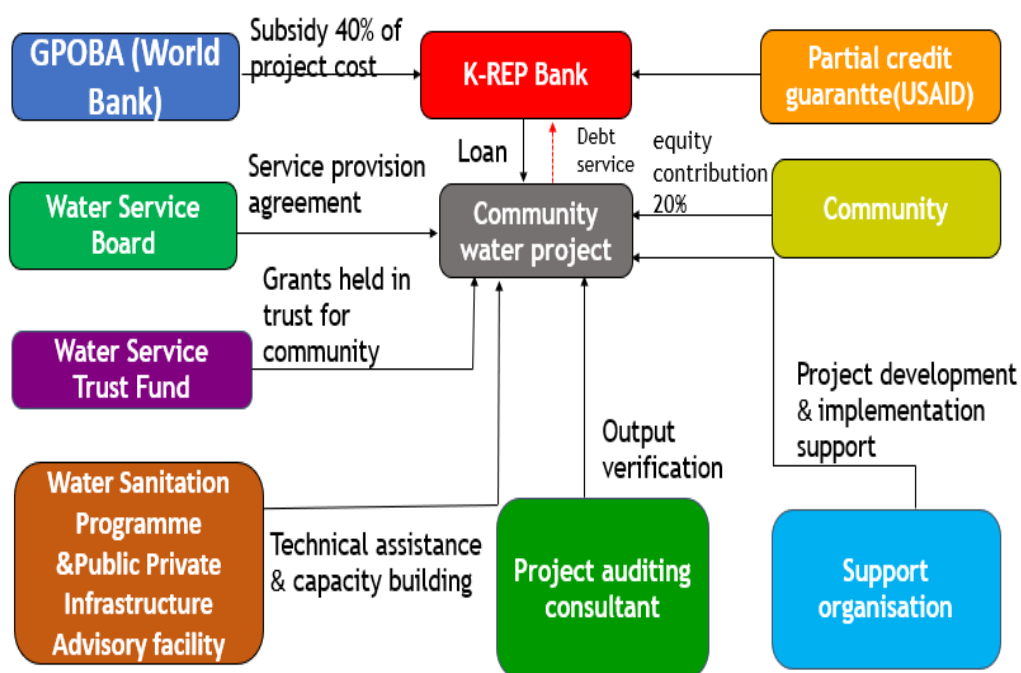


Figure 4: Financial Structure of the Kenya Microfinance for Water Service Project

Source: (Adapted from Advani, 2011)

- 1. Global Partnership on Output Based Aid (GPOBA)** The Global Partnership on Output Based Aid (GPOBA), now known as Global Partnership for Results-Based Approaches (GPRBA) designs and funds result-based financing project to improve access to basic services such as water in developing nations. GPOBA is a multi-donor facility hosted by the World Bank. GPOBA's role in the project was provision of output-based aid (OBA) subsidies to support the project implementation. The organisations that contributed to the subsidy programme through the GPOBA include: The International Finance Corporation (IFC), United Kingdom's Department for International

Development (UK FCDO) and the Netherlands's Directorate General for International Cooperation. Additional funds were administered by the European Union in 2010 to support the scaling up of the project.

- 2. K-rep Bank:** Kenya Rural Enterprise Programme (K-rep Bank), now known as Sidian Bank, is a microfinance institution in Kenya that is registered as a commercial bank. Involvement of K-rep was solicited by a team at the World Bank who participated in designing the OBA programme to attract the private sector toward project financing³. K-rep Bank found the project attractive due to its alignment with the kind of programmes it was supporting within the community and also due to the fact that

Investments funded under the program included:

- The installation or rehabilitation of small piped water systems;
- The development of water sources such as boreholes;
- The construction of water treatment and storage facilities;
- Installation of water metering and billing facilities to enhance the efficiency of water supply services

community-based organisations form a significant part of its customer base (Advani *et al.*, 2011). K-rep Bank accommodated the programme on condition that there would be internal capacity building to facilitate such kinds of financing as its own institutional structure was not able to handle project financing³.³ above As an implementing agency and a grant recipient of the Kenya Microfinance for Water Service project under the 'Maji ni Maisha' program, the bank's goal was to offer water infrastructure loans to communities where customers were willing and able to pay for clean and safe water. The bank's role was to approve and disburse loans to community water projects and recover the loans upon project completion.

- 3. Community water service providers:** The community water service providers provide water services within the community and were charged with the responsibility of developing and managing water assets.
- 4. Water and Sanitation Program (WSP):** The WSP is a World Bank Global Partnership Programme and its role in the project was to provide technical support to the community water projects.
- 5. Public Private Infrastructure Advisory facility (PPIAF):** The PPIAF provided grants to the Water Service Trust Fund that were channelled to the project development facility to aid in technical assistance in the development of bankable loan applications by the communities⁴.
- 6. Development Credit Authority (DCA):** The USAID mission in Kenya established a DCA facility guarantee to assist local banks in lending to the water sector, which is perceived to be high risk. A partial 50% credit guarantee was provided to K-rep Bank by the USAID Development facility during the implementation phase of the project. Once the community water projects

³ (BIR, 23rd April 2021).

⁴ The Public-Private Infrastructure Advisory Facility (PPIAF) was established in 1999 to act as a catalyst to increase private sector participation in emerging markets

receive the OBA subsidies, it was no longer covered by the partial credit guarantee and the credit risk is then passed on to K-rep Bank. (Advani *et al.*, 2011)

7. Other organizations: Other organisations that were involved in the project as per the Global Partnership Output based aid completion report (GPOBA, 2015) include:

- a) National Environmental Managing Authority (NEMA) which ensured that the projects complied with the environmental regulations.
- b) Water Service Trust Fund charged with the responsibility of vetting and monitoring community water providers.
- c) Project auditing consultants who were in charge of output verification and recommendation on the issuing of subsidies.
- d) Water Service Board was in charge with issuing of permits to water service providers to supply water within demarcated areas.
- e) Water Resource Management Authority who provided permits to water service providers to obtain maximum water volume in a day from the source chosen.

2.1.3. Description of OBA subsidy as a financial instrument

Output-based aid (OBA) is an innovative approach aimed at enhancing access to basic services explicitly targeting the poor who are usually unable to afford the full cost of user

Terms and Conditions of the OBA Subsidy as outlined in GPOBA report (GPOBA, 2015):

- a) The OBA target outputs for each subproject were clearly stated in the K-Rep loan agreement.
- b) Assessment of the baseline conditions relative to the specific outputs achieved by the subprojects was done by the project auditing consultant.
- c) An outputs report was submitted by the community water project to K-Rep Bank upon completion of construction.
- d) The project auditing consultant then had to revisit the projects to verify the outputs against the pre-set targets and recommend OBA subsidy payment based on the percentage of the outputs achieved. The OBA subsidy goes into settling outstanding principal loan amount
- e) In circumstances in which the outputs achieved were less than the required 100 percent, an additional field visit was conducted in less than six months of commissioning the project. After achievement of all outputs, then the remaining subsidies would be disbursed.

fees to access basic services⁵. The OBA in the project was provided by the Global Partnership on Output Based Aid (GPOBA) programme. The GPOBA programme was established in 2003 by the UK (FCDO) and the World Bank (GPOBA, 2009). In the OBA financial scheme, delivery of service is provided by a private implementing agency that receives a subsidy as a part of the user fees. The implementing agency pre-finances the project until specific outputs are delivered, then the output-based aid subsidy is released.

The community was eligible for additional finances issued in the form of grants by the Water Sanitation Program and the Public Private Infrastructure Advisory Facility (PPIAF) to pay project implementation consultants as well as the project auditing consultants. Upon completion of the project, community groups then contracted an operator to manage the project after implementation.

2.1.4. Characteristics of the loan programme

The loan programme had the following features as outlined in Table 1

Table 1: Characteristics of the loan programme

Borrower	Community water projects that are registered
Purpose	Finance new or existing water projects
Loan amount	Loan value ranged between 5 to 10 million Kenya shillings (US\$ 50,000-100,000)
Maximum financing amount	80% of the total project cost
Interest rates	Interest charged was fixed at market rates, ranging between 16% and 18% per annum.
Loan tenor	1-year grace period + 5-year loan term
Loan appraisal fee	Charged at 1.5% which would be payable upon first disbursement.
Greenfield projects	Interest was capitalized during the grace period.
Community equity	The community contributed 20% of the cost of the project.
Subsidy	Subsidies of 40% of the total capital expenditure were available upon completion of set targets based on the number of water connections and the monthly revenue realised. Revenue was then used to offset a part of the loan.
Loan repayment	The outstanding loan amount, after subsidies were applied, was repaid using the revenue earned from the water sales. The repayment was due monthly after end of the grace period and was completed over a 5-year period.
Risk mitigation strategy	K-Rep purchased a partial credit guarantee from USAID's Development Credit Authority for 50 percent of the loan principal.

⁵ International Development Association. (2009). *A Review of the Use of Output-Based Aid Approaches*. November, 52.

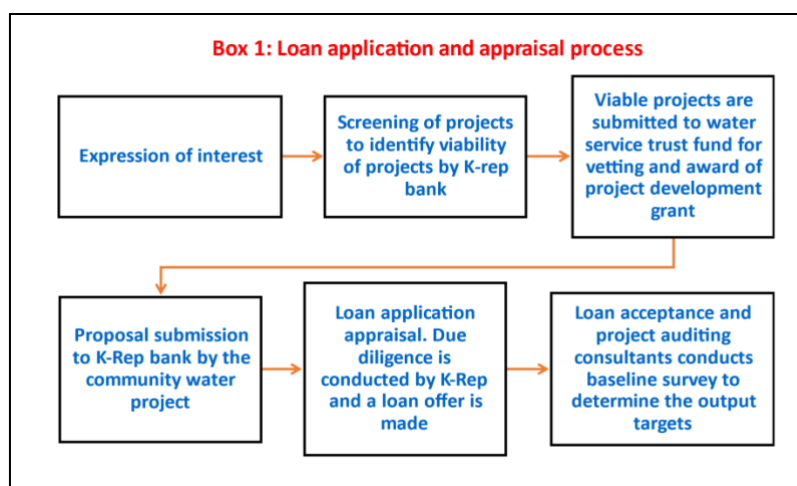
	Upon the community water project receiving the OBA subsidies, the partial credit guarantee ceased and the whole credit risk was then passed on to K-rep bank.
Loan Security	Registered charge on fixed assets owned by the borrower
Contractual savings	All projects were required to deposit an additional 15 percent of debt service payment in the form of contractual savings for maintenance. After repayment of the loan, projects also needed to continue savings to build its equity for future borrowing.
New projects (Greenfield)	Cash collateral was provided where there was limited availability of collateral.

Source: (K-rep Bank,2011)

2.1.5. The Loan Application and Appraisal Process

The following steps outline the loan application and appraisal process outlined by K-rep Bank:

1. Registered community water projects expressed interest to participate in the programme and issued supporting documents to the bank to verify its eligibility.



2. Screening of the expression of interest was done by K-rep Bank to identify viable projects to finance. The screening process involved both a desk review and a field review.

3. Upon identification of viable projects, they were forwarded to the Water Service Trust Fund for vetting.

4. The community water project then submitted a detailed proposal to K-rep bank. Technical assistance was provided to the community water projects through a support organisation from project development to the project implementation phase. The support organisation assisted the community in developing bankable loan applications and supervised the implementation of the project.

5. Due diligence is then conducted by the bank and upon approval a loan offer is made.

6. On acceptance of the loan offer, a baseline survey is then conducted by the bank through a project auditing consultant to establish the outputs based on the performance indicators to be achieved at the end of the project.

7. Upon approval of a loan application, the bank implementation phase begins, and the project is financed by 20 per cent cash equity from the community and a loan of a maximum of 80 percent of the total project cost is provided by K-Rep Bank. Loan disbursements were issued

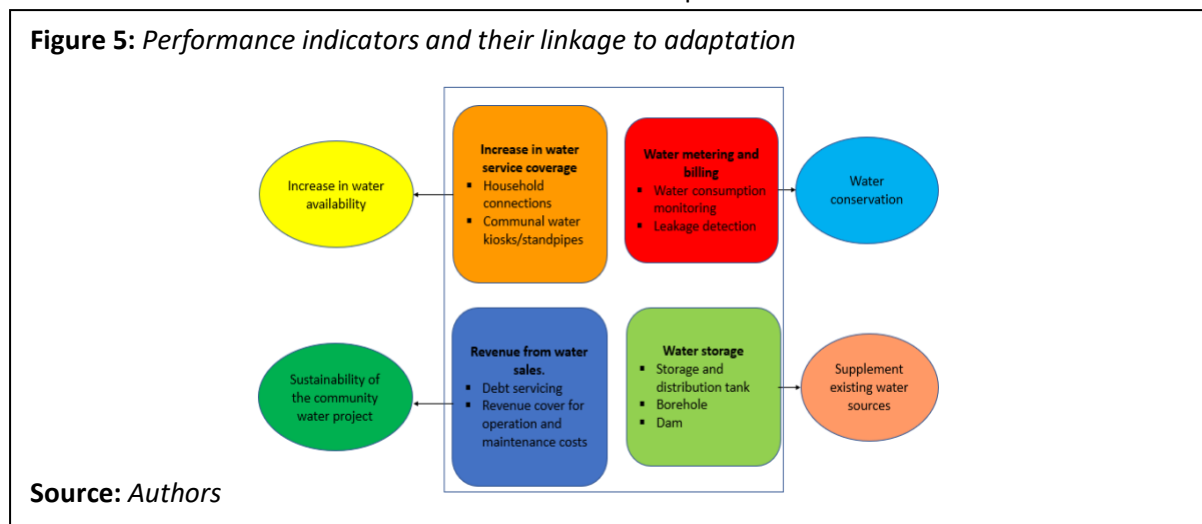
in tranches and on a pro-rata basis (Advani, 2011). Sources of community equity included retained profits specifically for projects that were already existing, and advance water connection fees. **In total, the projects supported 35 water projects, mobilised 1.2 million USD of community equity, loaned 3.4 million USD and granted output-based aid of 2.8 USD** (Advani, 2016).

8. Project implementation: Implementation of the project was completed within one year after disbursement of loan.

The community was eligible for additional finances issued in the form of grants by the Water Sanitation Program and the Public Private Infrastructure Advisory Facility (PPIAF) to pay project implementation consultants as well as the project auditing consultants. Upon completion of the project, community groups then contracted an operator to manage the project after implementation.

2.2. Performance indicators and their linkage to adaptation

The key performance indicators for the community water projects include: increased water service coverage; increased water metering, increased revenue, and water storage. These indicators helped boost the resilience of communities. More details on the performance indicators are discussed below.



2.2.1. Increase in water service coverage

Increased water service was achieved through the establishment of a piped water distribution networks that provided connections to individual households as well as at the community level through the communal water kiosks/standpipes. For example, 760 households were connected to the water supply system after the completion of the Kiamumbi water project (GPOBA, 2015) and currently approximately over 1500 households are connected to the water supply systems⁶ due to the growing population in the area.

Increasing water service coverage led to increased water supply which aligns with IPCC sectoral adaptation option in the water sector which highlights supply-side management as a measure to

⁶ FGD, 23rd July 2021

enhance adaptive capacity (IPCC,2001). New water sources such as boreholes were also constructed in some of the subprojects like in Karweti water scheme, to supplement existing water supply systems (Advani, 2011). Drilling of borehole is a conventional approach to improving access to groundwater sources in the occurrence of drought conditions.

Agricultural water connections were also established. An example of this is in Mt. Kenya Buri, where pipes were laid on plots mainly for irrigation although households also used the water scheme for domestic purposes (GPOBA, 2015). Irrigation as an adaptation measure ensures availability of water to the agricultural fields even during dry conditions hence, promoting food security.

2.2.2. Water metering

The project also sought to improve efficiency of water provision to both the existing and new water consumers (GPOBA, 2015). K-rep Bank provided the condition to the community water providers to install meters for each of the water consumers. Water meters enabled the mapping of distribution network, provided reliable data for billing purposes, and helped in detection of water leakages through comparing water produced to amount of water metered at the end user level. Leakage detection increased efficiency of water services in reducing loss of water and increasing water conservation. Apart from contribution to climate resilience, leakage detection and prevention contributed towards climate change mitigation through energy savings in the treatment, transportation and distribution of water (USEPA, 2010).

2.2.3. Revenue from water sales

Community-managed water systems are highly vulnerable to severe weather events and have a lower capability to achieve sustainability than other utility-managed systems (Elliot *et al.*, 2011). This therefore presents the need of post-implementation support. Studies indicate that presence of post construction support in terms of assisting the community in management of projects increases the sustainability and success of community-based water systems (Bakalian *et al.*, 2009; Elliot *et al.*, 2011). During the operational phase of the Kenya microfinance for the water project, revenue was generated and this was channelled to servicing the debt and also to cover the operation and maintenance costs of the water system. Additionally, the community water projects were required to hire a contractor who would manage the project in its post-implementation phase. These factors enabled the communities to have sustainable access to water supply even in the wake of climate change impacts such as drought.

2.2.4. Water storage

Communal water kiosks often have storage tanks that ensure that water is stored and can be available even in cases when there are water shortages. Additionally, some of the community water projects example in the Karweti water scheme (Advani *et al.*,2010), Kiamumbi and Mt Kenya Buuri water project established water storage tanks to store water and release the resource when it is needed.

3.0 Findings

3.1 The Fit of the financing strategy

This type of financing strategy was ideal for this specific project as opposed to the traditional financing method due to the following reasons:

- a) The project involved both the installation of new and rehabilitation of the already existing community water infrastructure. Traditional financing tends to focus more on greenfield projects and not brownfield projects (GPOBA, 2015). Adaptation in the water sector requires an innovative way of providing support to the community water projects especially because the sector has been relying on grants in the past and more focus was on the establishment of new infrastructure (Mehta, 2008). The innovative financial structure within the project was used to finance both new and rehabilitation of the existing water infrastructure within the communities.
- b) This approach provided immediate finances to the communities to support the water projects. Small community projects tend to rely on government grants in most cases which are scarce and sometimes costly for the government to carry out the project solely (GPOBA, 2015).

3.2 Innovativeness of the financing strategy

The financing strategy was innovative due to the following reasons:

- a) The use of output-based aid subsidies created a link between microfinance institutions and the poor (the vulnerable group) in the rural and peri-urban areas (GPOBA,2015).
- b) The use of output-based aid subsidies made the water interest rates affordable to the water consumers while it also reduced the risk to K-rep Bank who provided the loans. The subsidies were channelled towards loan repayment and therefore also served as risk mitigation in addition to the partial credit guarantee offered by the USAID DCA facility.
- c) Blending of finances and use of OBA subsidies, and additional risk mitigation strategy in form of a partial credit guarantee played a pivotal role in enhancing the project success.
- d) The financing of both greenfield and brown-field projects created a significant impact in the community.

The following table outline benefits of the financial structure and of the innovative financial instruments used.

Table 2: Benefits of the financial structure and innovative financial instruments used

	Benefits of the financial structure and of the innovative financial instruments used	How benefits of innovative financial instruments were realized in the Water Service Projects
1.	Generated additional development funds by tapping new sources of funding.	The use of subsidies attracted commercial financing as it reduced the risk of the lender.

2.	Result-based financial approach with linkage to measurable performance on the ground	The result-based approach was realised due to the use of OBA subsidy which ensured that the intended beneficiaries benefit from the project (Advani, 2011). The OBA Subsidy was disbursed upon the realisation of the set performance indicators prior to the commencement of the project. See figure 5.
3.	Encouraged support and technical assistance towards the projects	Grants were provided to cater for the cost of provision of technical assistance to the community water project throughout the project cycle right from development of bankable proposals until the implementation of the project. (Advani,2011).
4.	Risk Mitigation strategy	The partial credit guarantee from USAID's Development Credit Authority facility mitigated the risks of implementation failure (Advani, 2011) and therefore provided a certain level of comfort to the lender to engage in financing the community water projects.
5.	Enhanced project ownership by the community	The community participated actively in the project through community equity contribution. This strengthened community ownership and responsibility which was key for sustainability of the project

3.3 Success Factors for Financing the Project

The project realised a high impact and also service provision. ²Some of the factors that enhanced the success of the project include:

1. Bankable water schemes:

- a. The project insisted on bankable proposals that would yield positive returns. Bankable projects attracted the limited private finance resources for adaptation as the projects addressed the private sector's main concern of commercial returns on their investments ³. As a result, the projects yielded positive economic rates of return of US\$2-US\$10 for every US\$1 invested. Economic rate of return ranged between 64 percent to as high as 392 percent in the subprojects (GPOBA,2015). Out of the 35 community water projects only 3

³(BIR, 23rd April 2021)

went into default. According to K-rep, this was a much better performance of the portfolio compared to normal commercial loans⁸.

b. The use of subsidies allowed leveraging of commercial financing and increased the viability of investments linked to the poor.

- 2. Willingness and ability to pay by the consumers:** The willingness and ability to pay enabled the selection of viable projects that could sustain themselves in the long run. For communities who were unable to pay, water was provided through point sources such as kiosks (GPOBA,2015).

The payment for water services enabled successful repayment of the loan and ensured availability of funds to cover the operation and maintenance costs⁸. The ability to pay for services is an important aspect in adaptation to ensure that the operation and maintenance of adaptation investments are covered, thus ensuring the sustainability of such projects. All the financed projects had meters installed and billing in accordance with the water volume consumption tariffs ensuring revenue generation to cover the operation and maintenance costs of the water schemes

- 3. Blended financial approach:** Adaptation projects mostly rely on grants due to adaptation being framed as a public good. This was confirmed by AfDB official who indicated: *it's really hard to convince people that there can be a private sector case for adaptation. Because for the longest time, we have framed adaptation as a public good, as development, pure development grant based small scale, non-scalable and limited business commercial viability and those are the inherent challenges*⁹. The financial structure within the project utilised multiple sources of funds including community equity, loans, and OBA subsidies. The use of subsidies encouraged the mobilization of domestic financing hence a reduction in the demand for grant finance. The blended finance approach, improved the risk-return profile of private sector investment in water projects
- 4. Post-implementation project management:** The provision of a management contract in the post-implementation phase introduced the aspect of sustainability. The community water scheme hired contractors who ensured the projects continued to operate and run smoothly because of revenue earned from the water sales even after the completion of the project.
- 5. Affordability of the Water schemes:** The average water tariff rates ranged from US\$0.45 to US\$1 per cubic meter (GPOBA, 2015). The use of subsidies made the water interest tariff rates affordable. Upon the establishment of water connections as per the set target, the OBA subsidy was disbursed to pay down part of the loan, hence reducing the expense burden on the communities.
- 6. Financial risk mitigation:** The bank felt that providing credit without collateral was quite a risk and, hence, was the reason for the K-Rep Bank negotiating a partial credit guarantee arrangement with USAID³. This partial guarantee meant K-Rep Bank did not bear all the losses in cases of implementation failure and that the loss was also not loaded on the community³.

⁸ (SOR, 14th April 2021).

⁹ (BIR-1, 17th February 2021).

The use of subsidy was also an efficient risk management option for the lender(K-rep) as it was credited to the loan account of the community water project.

7. Availability of technical assistance:

- a. The community water schemes lacked the capacity to develop feasible project proposals and even to manage the water projects. To increase the viability of community water projects, K-rep Bank offered technical assistance and even provided a small grant of US\$9,000 to cover for the cost of the hired consultants who were assisting the communities to develop a feasible project proposal. Upon approval of projects, K-Rep provided a subsequent grant of US\$12,600 to cater for consultancy, project construction supervision, and set up of management systems (GPOBA, 2015). The grant and technical support was provided by the Public Private Infrastructure Advisory facility as well as the Water and Sanitation Program. The availability of technical assistance provided for decision support tools and it also built on the capacity of the community managed water projects.
- b. One of the organisations that provided technical assistance to the community water project was Rural Focus Ltd who were charged with the responsibility of developing a business plan, assessing community water projects which included assessing the community in terms of the hydrology, the water demand, water resources and other environmental aspects ⁸.

- 8. Enabling policies:** Policies and regulatory frameworks can play a crucial role in encouraging private sector investment in adaptation (Fayolle *et al.*,2019). The existence of *Water Act 2002* in Kenya assisted in shaping finance access in relation to water projects. Through the Act, the role of independent regulation was established and also the Act brought about the transformation of the operation and efficiency of the water service providers through introduction of tariffs. These actions promoted financial sustainability of water service producers.

3.4. Challenges encountered in financing the project

Despite the success factors there were also challenges during the project implementation phase. These included;

- 1. Implementation delays:** Implementation delays were experienced by the project (GPOBA, 2015). Ten of the originally planned 21 sub-projects in the pilot phase of the project were completed by November 2010; two years after the original project closing date (Advani,2011). A common challenge in adaptation projects is a lack of access to adequate information to support the adaptation finance actions; especially where there is a unique financial structure within the projects. Some of the delays could have been resolved if minor adjustments were made in the project preparation and design phase. These include: defining a loan disbursement window that is at least 1 year before the project closure and enhance timely completion of project outputs; evaluation of capacity and time needed by the relevant actors and implementing agency to complete all processes before loan appraisal; allocating more time to the relevant stakeholders to secure ownership of the project processes. (GPOBA, 2015)
- 2. Limited bankable community water projects:** There were limited community-managed schemes with effective management that had the ability to present bankable loan applications.

Key aspects of bankability considered by the private sector is the potential financial returns of a project after evaluation of the cost and benefits of a project³. However, in the context of climate change, bankability involves encompassing socio-economic impacts such as enhancing the resilience of communities (Ellis et al., 2017). Some of the sub-projects received less subsidies than the intended project due to failure to meet their revenue targets (GPOBA, 2015).

- 3. Limited Private Sector Capacity:** Limited private sector capacity in terms of skills and tools to manage project financing by the commercial banks was a challenge and K-rep Bank had to build capacity internally to accommodate such kind of financing³. Community water projects also lacked the experience and financial capacity to manage these specific projects and significant funds had to be channelled towards providing technical assistance. This is a common challenge in adaptation particularly in developing countries where barriers to adaptation are linked to constraints in the capacity of institutions. Most projects therefore require technical assistance and project development support needs to be provided (Junghans *et al.*, 2016).
- 4. Tracking of adaptation:** Benefits from the project were calculated based on the approximate number of household connections, agricultural connections, communal water kiosks and standpipes. Despite the connections of institutions to water services, no counting was done because of lack of sufficient information to calculate the number of people served through this type of connection as well as the potential of double counting (GPOBA, 2015). The issue of double counting is a common challenge in climate finance (Watson et al., 2012) as well as the lack of a universal standard metric for measuring adaptation outcomes.
- 5. Challenges with the irrigation projects:** K-rep Bank tried to channel money into irrigation projects to see if this model would work but these were more problematic, primarily because the basis of repayment was based on agricultural revenue from the produce. Agricultural productivity was sometimes affected by other factors such as pests and diseases which in turn affected the revenue of the farmers hence limiting their ability to repay the loan⁸.

4. CONCLUSIONS AND RECOMMENDATIONS FOR REPLICATION AND SCALE UP

4.1 Conclusions drawn from the case study

- 1. Mobilising private sector participation is important for financing adaptation projects:** Climate change adaptation requires coordinated efforts among different stakeholders ranging from public to the private sector. The private sector can play a crucial role in closing the adaptation financing gap in developing countries. However, in order to crowd in the private sector to invest in adaptation action, there is need to address positive externalities to improve the risk-return profile of adaptation investments
- 2. Innovative financing mechanisms can make adaptation projects viable:** The findings of this study prove that investing in projects geared towards enhancing the adaptive capacity within communities in developing countries can be viable for commercial banks. The blending of the various financial instruments helps to leverage the private sector to invest in adaptation activities through addressing some of the concerns hindering private investment. Non-bankable projects can be made bankable through use of innovative financial instruments that leverage on positive externalities of the project. Technical support is critical to help in the packaging of such projects.

- 3. Capacity building and technical assistance is key for the success of financing and implementation of adaptation projects:** Provision of technical assistance to support development and management of adaptation projects is critical especially in cases where there is limited capacity, skills and experience to handle certain projects.
- 4. Risk mitigation instruments are critical to mobilise the private sector into financing adaptation:**
 - a. Credit risk mitigation instruments such as credit guarantee schemes can increase the interest of commercial banks to finance adaptation activities or pro-poor investments.
 - b. The use of output-based aid (OBA) subsidies can be leveraged to secure co-financing from the private sector as they provide better risk mitigation for the lender; ensures that the debt service is affordable to the intended beneficiaries.
- 5. Community participation is critical in enhancing the success of adaptation projects.** The community should be involved fully into the project to enhance community ownership. In the case study the community made equity contribution, and this enabled them to have a sense of ownership and responsibility.
- 6. Success Factors:** The main success factors for sustainable adaptation project include bankable proposals, willingness and the ability of the consumers to pay, affordability of schemes through OBA subsidies, post implementation project management, availability of technical assistance and enabling policies and institutional framework.
- 7. Key Challenges:** The main challenges that hinder the investment of adaptation practices and technologies in developing countries include: business model barriers, internal capacity gaps and context barriers due to gaps in either policy and regulatory frameworks.

To address some of the challenges to enhance replicability and scalability of adaptation projects the following actions need to be undertaken: de-risking of adaptation investments, aligning the policy frameworks with adaptation investments, internal capacity building of institutions where there exist gaps, better coordination among the actors involved, increasing community awareness and interest in adaptation business models and continuous monitoring and evaluation of the projects.

4.2 Recommendations for upscaling and replications

There is need to replicate and scale up successful climate finance projects towards achieving climate resilience as public funds are limited and the demand for adaptation finance is high.

Although the idea of project financing was new for K-rep Bank, the 'Maji ni Maisha' project changed the perception of the bank, and it further expanded the model in sanitation and energy sector projects³. The output-based aid model has been adopted in quite a number of projects such as the Kenya integrated water sanitation and hygiene (KIWASH) project and the Dutch Wash Alliance (GPOBA,2015). Some other banks have also begun to adopt a similar model for their projects³. This type of financing strategy can be replicated to other projects and in other countries as long as favourable factors are present. As per GPOBA report, approximately 11 million people are beneficiaries from the OBA schemes in 33 countries.¹⁰

¹⁰ <https://www.gprba.org/>

After completion of the pilot project, the project was scaled up with additional subsidy support of 2.2 million USD from the European Union and credit facility of 3.2 million USD from K-Rep Bank. (Advani et al., 2016). Some of the lessons that can be recommended for scaling up and replication are:

- a) **Establishment of a credit rating database of adaptation projects.** This can assist both the lenders and the borrowers to have an objective opinion on the issue of risk and credit worthiness. investment-grade ratings. During the scale up phase of the project, a partnership between the Water Services Regulatory Board (WASREB) and the World Bank was established to assess creditworthiness of utilities. Credit ratings of 43 Kenyan utilities were published as of 2011. (A or BBB)¹¹ was issued to 13 utilities and another 16 utilities were issued with a near-investment grade rating (BB)¹² (Advani,2016).
- b) **Capacity building:** Adequate capacity building for local commercial banks is needed to handle projects with the nature of project finance. The lender, K-rep Bank conducted internal capacity building to the project teams to enhance their credit appraisal skills that are commonly used in project finance (Advani *et al.*,2011).
- c) **Establishing local business development service providers:** Business development services to support community managed water schemes is critical. According to the findings of the pilot project, communities had limited skills and experience to efficiently implement and manage water projects. Under the scale up programme business development support service was established through shortlisting of 3 companies. These companies were trained to build on their capacity to support community projects. Capacity building and technical support is an essential component of climate change adaptation actions to overcome the challenge of limited skills and experience within the community.
- d) **Monitoring and Evaluation:** To enhance sustainability of projects, there is need to have a dedicated financing facility channelled towards monitoring and evaluation. The aspect of monitoring and evaluation is key in adaptation to support informed decision making and enhance transparency and accountability.
- e) **Technical support to develop bankable Proposals:** Provision of technical assistance to develop bankable loan application is critical as the private sector is keen on the bankability aspect of projects

¹¹ A ratings indicate a low likelihood of default while BBB rating indicate that the danger of default is minimal,

¹² BB ratings indicate a high risk of default, especially upon occurrence of adverse changes in business or economic conditions

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