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TRANSFORMATION TOWARDS SUSTAINABLE
AND RESILIENT WASH SERVICES

Building community WASH resilience: the case study of a rock catchment system in Marsabit County, Kenya

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Implementing a rock catchment project entails a myriad of approaches and technological measures. The choice of approaches and technologies are a product of processes driven by the organisational culture, capacity and strategic priorities of the implementing development organisation. The approaches and technologies employed by the development agencies with the objective of improving water services are expected to align to the sector regulations. This expectation has not been entirely realised. At a time when climate risks have markedly increased, Caritas Switzerland in its effort to achieve sustainable water services at the community level, has employed technologies and approaches with impressive results. This has been possible through consolidating lessons learnt incrementally. This paper examines success features observed during and after the implementation of a drought resilience project by Caritas Switzerland in partnership with Ndikir community in Marsabit County, Kenya in 2014/15.

Background

75% of Kenya's land mass is classified as arid and semi-arid lands (ASAL). This means that a large part of the country struggles with rainfall deficits and variability. It´s rangelands remain prone to degradation from increased pressure resulting from overstocking, frequently failed or insufficient rainy seasons, and it's rapidly increasing population. Climate variability remains the main threat to social and economic development in the ASAL (Kenya National Climate Change Action Plan). Droughts and floods are both increasing in frequency and severity. Droughts have become so frequent that full recovery hardly happens before another episode sets in. As a result pastoralist livelihoods are projected to decline (Macmillan, 2011). The situation in the ASAL is compounded by poor access to basic services such as health centres, schools, roads and water among others.

Despite many challenges and increasing climate risks, the Kenya´s economy has remained relatively resilient in the last decade. However, the country continues to struggle with unprecedented social and regional inequalities (KNBS, 2013). Development progress has been achieved disproportionately favouring the high potential areas and major urban centres. Large parts of the ASAL continue to lag behind.

Development organisations have implemented programmes and projects, using different approaches and technologies with usually mixed results. Approaches, practices and technologies applied by the development organisations continue to attract debate – whether they are working or not. For instance, the sustainability of water trucking has been questioned as it rather undermines community resilience (Wekesa and Karani, 2009). The practice is still widely carried out often under the veneer of emergency response.

Introduction

Rock catchment

The rock catchment technology has existed in Kenya since the 1950s with early construction done by the government in Kitui. Some of these systems are functional to-date with little maintenance required. The designs for rock catchments have evolved with time. Caritas Switzerland is using the so called land development board (ALDEV) rock catchment design which is simple and easy to maintain.

As outline in another paper developed by Caritas Switzerland (Leclert et al, 2014) in principle a rock catchment system is simple: The run-off water from a rock surface is channelled by gutters to the weir(s) from where it passes a filtration box (sand filter principle) before it is piped into closed storage tanks. With this system, water can be stored under safe conditions and is protected from contamination and evaporation. Ideally, the weir is connected to a sufficiently large storage to avoid water remaining in the open weir for long periods of time. The storage tanks must always be situated at lower level than the weir in order to facilitate run off water to be gravitated to the reservoir. The tank(s) is (are) connected to water kiosks or tap stands from where water can be fetched. The storage tanks are made of reinforced rubble stone masonry and have a volume of 100 to 150 m^3. The provided storage capacity depends on the yield of each catchment.

Based on Caritas Switzerland's experience in Kenya and South Sudan, a rock catchment system that can harvest and store water to a capacity of 1.5 million litres per year costs between USD 100,000 and 200,000. Comparably, this is a huge investment initially. However, the benefits in the long run far outweigh the initial cost. A rock catchment system has relatively low maintenance cost estimated at about USD 500 per year (Leclert et al., 2014). There are no recurrent costs in contrast to borehole water systems common in the ASAL. Only basic operational skills are required to run a rock catchment system. A rock catchment system provides better quality water, compared to prevalent saline water from boreholes. Technologies to desalinate water from boreholes and shallow wells remain unavailable and its cost would be unaffordable. Rock catchments have one main limitation though: the technology can only be used where naturally occurring large, open and gently sloping rocks are part of the landscape.

Caritas Switzerland

In Kenya, Caritas Switzerland´s work has grown from basic humanitarian response in the 1990s to expanded programming guided by the commitment to link relief, rehabilitation and development (LRRD) since 2013 when Caritas Switzerland rolled out recovery projects in the two ASAL counties Marsabit and Wajir. The projects were in response to the 2011 disastrous drought which affected the entire Horn of Africa. In one of those projects, Caritas Switzerland successfully implemented rock catchment systems in the three communities of Ndikir, Manyatta Lengima and Mpangas of Laisamis sub-county, Marsabit.

Conceptual Framework

Policy to practice continuum

Successful implementation of a rock catchment requires a set of conditions. Organisational capacity is at the core in the quest to achieve quality projects and the performance level needed (Fowler, 2002). Different organisations employ diverse measures towards growing their internal capacity while applying different assessment tools (Gubbels et al., 2000). Staff training while fostering a culture of organisational learning is central in instilling the organisational qualities needed to deliver quality projects. In implementing a project with a big infrastructure component like a rock catchment, an organisation may have a bias to paying more attention to the physical infrastructure at the expense of sufficient 'soft' processes needed. The processes should link well with different stakeholders, considering the mandates of different players to engage - the beneficiary community, county and national government and non-government organisations. The Kenya Water Act 2016 provides the institutional and legal framework for management of water resources and services provision in the country, setting up key institutions for the implementation of the policy. A rock catchment system constructed with the aim of providing water services should not function in isolation. This is mostly not the case. The implementation of Water Act 2002 was characterised with significant gaps. Development agencies have implemented water projects falling short of compliance measures as laid down by the water sector policies (Leclert et al, 2015).

In practice, a project combines multiple approaches to achieve the intended purpose. Similarly, and in most cases, a technology or a combination of technologies are used to address the needs as defined in a project. The World Overview of Approaches and Technologies (WOCAT) defines technologies as physical and mechanical measures that aim to promote conservational land use and may include structural measures among others. The physical measures could include constructed structures such as dams, terraces, and channels among many others. Further, WOCAT defines approaches as ways and means that are used to implement a technology. Approaches are described as technical and material support, involvement, and roles of different stakeholders. In a WASH project for example, an approach would entail the government, community and other NGOs engagement processes. Usually this is done to enhance the buy-in of the concerned stakeholders. Approaches are activities aimed at creating the needed social and political capital

for effective project implementation. The aim is to have in place working community institutions and structures, building and/or strengthening the needed capacity to manage the project's assets and creating greater ownership of the project activities and outcomes. Technologies aim to create the physical assets. This could include the constructed water systems, agricultural structures such as the cattle dips, stores etc.

The selection and implementation of approaches and technologies should be done while keeping in mind the existing legal and policy frameworks of a country. For example, a WASH project should ensure that the technologies and approaches selected are in line with the national regulatory framework, and the standard guidelines and designs. In Kenya, for instance, there are design guidelines for latrines in schools and regulations for exploiting water resources. Similarly, the technology selected and implemented should meet the requirements of the existing conventional standards that define the operations of each sector. More importantly the approach and technology selected need to be locally appropriate and adaptable. Organisational leadership is an enabling factor that ensures the correct application of approaches and technologies. A good project would therefore be evaluated on the basis that it is cognisant to, and complies with the relevant regulatory and legal frameworks.

The figure below illustrates the relationships of policies, implementing organisations and the approaches and technologies practiced:

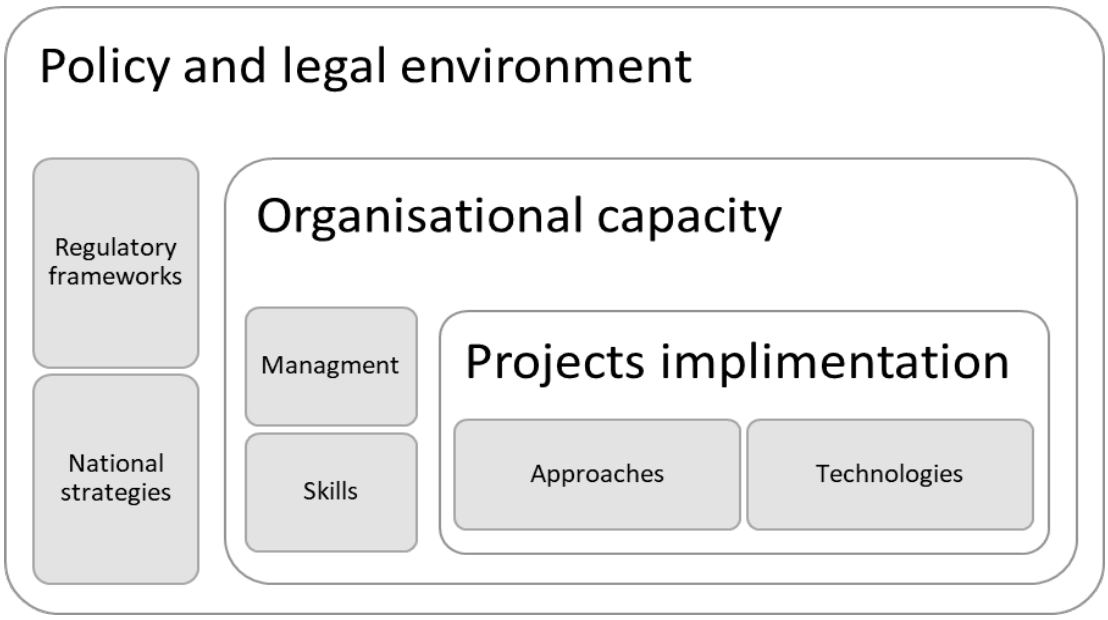

Figure 1: Illustration of policy to practice continuum

Source: Fredrick Ochieng

Case study Ndikir community

Access to reliable and safe water is one of the most important livelihood factor among the pastoralists in the ASAL. Livestock keeping is the primary economic activity in the region, in addition to derived social and cultural values. At the peak of now frequent droughts, water scarcity impacts every facet of the livelihood systems. Livestock body conditions deteriorate and in severe cases of drought, significant mortalities are recorded. Livestock prices in the market dip due over supply and poor body conditions. External buyers shy away or offer to buy at throw away prices.

Photograph 1. The completed rock catchment system Manyatta Lengima

Photograph 2. A almost completed weir of the rock catchment system in Ndikir

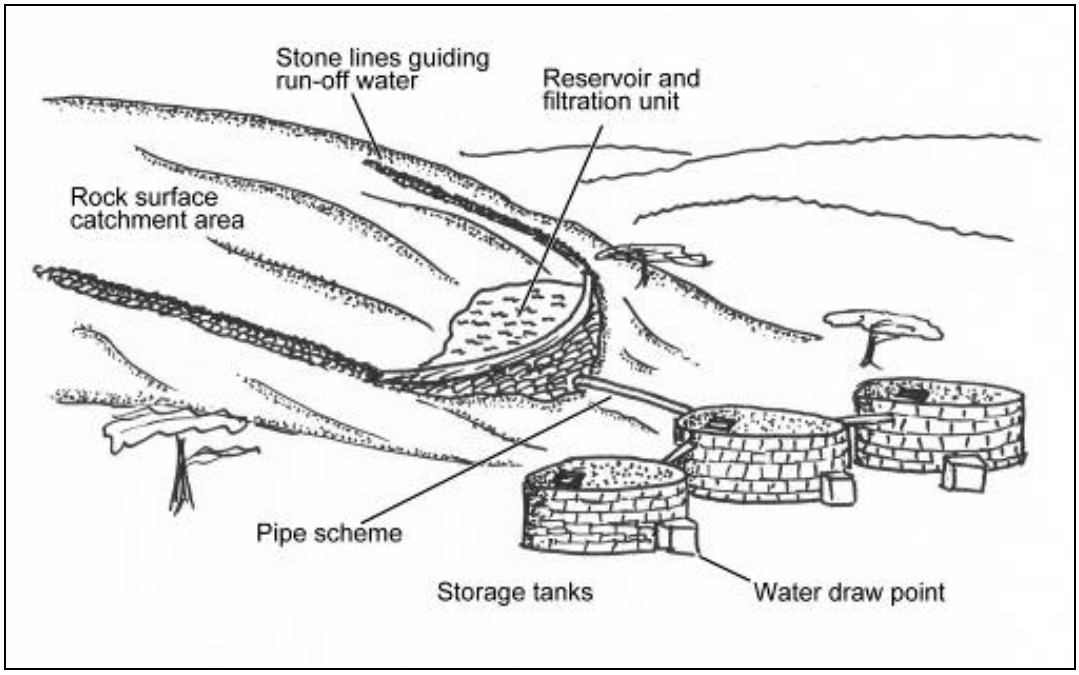

Figure 2: Schematic representation of a rock catchment system

Source: Caritas Switzerland

Ndikir community in Marsabit County partnered with Caritas Switzerland and the county government for the implementation of a rock catchment project between 2014 and 2015. Discussions with the parties led to the signing of a memorandum of understanding (MoU). The MoU spelt out the scope of partnership and roles and responsibilities of each party. The system was completed within two years. Currently it is still the main source of water for the community.

The Ndikir community was highly vulnerable to droughts due to water scarcity. Each dry season warrants external intervention through water trucking by the government and humanitarian organisations. Water trucking is one of the most unsustainable methods of providing water for stressed communities. It was expensive and highly prone to contamination putting lives into high risk of disease outbreaks.

During the most recent drought season spanning from mid-2016 to 2017, the Ndikir community did not need water emergency unlike several communities in the region. The management group has done well to regulate water use with the aim to have enough water to supply the community throughout the dry season. In one single rainfall season, which could last for between one to two weeks, the system has the capacity to harvest 1.6 million litres of water each year. This translates to each household accessing about 20 to 30 litres of water per day throughout the year. Each household pays 1 USD per month for maintenance purposes. The committee formed and trained during the construction is active and ensures the system is operational and by-laws are followed by all the users.

Lessons learnt

- Technology choice – community water systems should critically consider the capacity of the users in terms of technical skills and financial capacity for operating the system. More technically sophisticated systems have shown less sustainable. This has been evident with boreholes systems that are generator-run. Maintenance require skilled personnel and parts which often are not available locally. These systems have continued to rely on external support to function. A rock catchment system is simple to run and requires minimal routine maintenance;
- Community leadership – leadership fosters community cohesion and consistency in project implementation and the overall measures put in place to manage the water system. Ndikir community has stood out as very successful. The leadership by the council of elders has been supportive to the management committee. Rules guiding water use are easily followed and enforced. The leadership has therefore remained integral element in sustainability;
- Partnership with community – the approach of partnership with community rather than working with community as mere beneficiaries strengthens community ownership of a community water system. Caritas Switzerland engages with communities at the project inception with the aim to promote understanding the project components, scope and roles and responsibilities for each partner. The agreement on roles and responsibilities are documented and signed by the parties implementing. The rock catchment communities provided significant material and in-kind contribution during the construction of the rock catchments. In Ndikir community, this approach has created greater sense of ownership and better organisation. However, this approach may require more time to ensure that its purpose is achieved;
- Benefits of initial investment for the best technology – the initial cost of constructing a rock catchment system could be higher than a borehole. Choice of the Technology and the Approach should not only be based on absolute cost of initial investment. Rather, the longer term cost-benefit analysis is key and should always guide the decision;
- Use of skilled artisans for water system construction – Caritas Switzerland has embraced this practice as a quality and cost effectiveness measure. Instead of the common practice of contracting a construction contractor, skilled artisans are hired, oriented on the design and implementation of works. Caritas Switzerland procure all construction materials. Technical staff supervise the artisans for quality control. This approach has allowed Caritas Switzerland to ensure construction quality measures. This practice leads to significant reduction of construction costs.

Conclusion

Dozens of community managed water systems collapse soon after they are completed by the supporting agency. A study by Kwena and Moronge (2015) revealed that 30% of the community managed systems do not tarry to the third year of their completion. Factors that would make these systems succeed or fail are either the choice of the Technology and/or Approach applied during project implementation. Organisational culture that prioritise learning sets the right path to identifying the appropriate approaches and technologies. Getting it right with approaches and technologies could be seen as an aspect of organisational capacity. Measures by the community and the supporting agencies should fit well with the country's policies and regulations.

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syndrome' is a real challenge when working with communities. We also want to extent our gratitude to all colleagues from Caritas Switzerland Kenya Programme. In particular, we want to thank Manja Graham, Country Director for Caritas Switzerland in Kenya for promoting a learning culture in the organisation and encouraging project team to constantly review the way they work, with the aim to always do better.

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