Strengthening Irrigation Schemes
Through Investment in Irrigator Organisations

Summary
Tanzania has only 589,245 (or 2%) of a possible 29.4 million hectares of irrigable land under irrigation\(^1\) and productivity of most of the rainfed agriculture is low. The potential to improve agricultural yields, resilience to climate change and income of smallholder farmers through improved farming practices, if combined with access to water and access to markets, is therefore huge. That is why in 2009, the Aga Khan Foundation (AKF) started the Coastal Rural Support Programme Tanzania (CRSPT) in Lindi and Mtwara Regions (LMRs) of southern Tanzania and began to work with smallholder farmers, local government and private sector to not only improve farming practices but also address the core issue of irrigation and market linkages. To date, AKF has worked directly with over 52,000 farmers, contributing to significant increases in yields, income and economic opportunities.

CRSPT employed ‘push’ strategies to enhance local agricultural productivity, efficient product aggregation, and accessible and relevant extension systems, alongside ‘pull’ strategies to encourage lead firms (end-market actors, input suppliers, and support service providers) to enter and expand in the two regions. CRSPT supported the establishment of demand-driven formal and informal groups for the delivery of training on good agricultural practices and for communal learning, linkages to markets and management of small-scale irrigation schemes. CRSPT’s intervention in community-based water management

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\(^1\) Tanzania: New Nationwide Irrigation Schemes in the Offing (2014, June 26). From AllAfrica.com

Coastal Rural Support Programme Tanzania
AKF’s Coastal Rural Support Programme Tanzania (CRSPT) was started in 2009 in collaboration with the Government of Tanzania with the long-term goal of improving the quality of life in Lindi and Mtwara Regions (LMR) through multi-sectoral interventions in the economic and social sectors. CRSPT started with a programme to increase financial inclusion for rural poor through the formation of community-based savings groups (CBSGs) and to support smallholder farmers to sustainably increase productivity of rice and sesame – adding horticulture in 2014, poultry and legumes in 2016 and sunflower in 2017 – and to facilitate the integration of smallholder farmers into market systems. In 2013, education and health programmes were introduced within CRSPT, as part of a growing multi-input area development (MIAD) approach across the two regions. CRSPT was designed and implemented in partnership with the Government of Tanzania and is funded by the Department for International Development (DFID), the European Commission, Global Affairs Canada (GAC), GIZ, Financial Sector Deepening Trust (FSDT), Gates Foundation, Johnson and Johnson Trust and the Agriculture Market Development Trust (AMDT). Under its economic development initiative, the programme has directly benefitted over 60,000 farmers and value chain actors and organised 178,000 people (66 per cent of them women) in savings groups.
is part of its climate-smart agriculture approach that includes promotion of good agricultural practices including conservation agriculture, efficient use of quality inputs especially seeds, and improved post-harvest management.

To enhance sustainability of irrigation schemes, AKF adopted a Public-Private Partnership (PPP) model under which the Local Government Authorities (LGAs) invested in major hard infrastructure (main canals and weir) while AKF focused on rehabilitation of existing structures and developing the capacity of local Irrigator Organizations (IOs). The IOs are responsible for and trained to effectively operate, manage, and sustain irrigation systems. Overall, AKF collaborated with LGAs on 7 (of an estimated 62 constructed and traditional) irrigation schemes, covering over 810 hectares of land of a total estimated irrigated area of 6110 ha in Lindi and Mtwara Regions.\(^2\)

Based on these efforts, AKF has brought to the fore several important lessons for future programming on irrigation which are summarised in this brief. AKF believes there is substantial potential for further improving agricultural productivity if access to water and water management are improved through a holistic and sustainable approach centred on enabling and empowering smallholder farmers to benefit from and manage their water resources.

**Rationale**

Rain-fed agriculture in Tanzania, which accounts for most of the country’s cultivated land, is prone to climate variability, increasing the vulnerability of smallholder farmers and potentially weakening the national economy. In the approved National Irrigation Act of 2013, the government of Tanzania ‘commit(s) to tap every single drop of water for productive irrigation purposes’. As part of the Agriculture Sector Development Programme (ASDP), Tanzania adopted a ‘decentralised’, ‘bottom-up’ approach where Zonal Irrigation Units (ZIU) with technical capacity, local government authorities with irrigation scheme management skills, and communities through their IOs, would develop and manage the schemes sustainably. However, these efforts faced a number of constraints identified in a study commissioned by AKF in LMR:

- Many IOs were hurriedly formed with insufficient awareness of their roles and thus members neither engaged with local government nor participated actively in scheme activities, such as meetings, trainings and collective actions. As a result, the development of the schemes was not owned and driven by the IO leadership and members;
- There was low farmer participation because farmers either did not join the local IOs or become full members, and lacked the evidence of gains from the schemes (partly because adverse weather conditions affected harvests while semi-functional schemes compromised access and farmer interests);
- There were, and still remain, large funding shortfalls due to competing priorities of LGAs for limited resources. This resulted in critical delays in scheme development, incomplete schemes, and infrastructure with relatively short lifespans;
- There was inadequate maintenance of infrastructure since the IOs lacked the skills to organise and perform maintenance activities. Also, local authorities lacked funds to support maintenance and although a number of schemes had technical staff allocated to them, staff turnover within the district councils exacerbated the situation.

\(^2\) pers. comms Zonal Irrigation Unit
The above findings are consistent with the Irrigation Thematic Working Group of the 8th Joint Implementation Review of ASDP (June 2013).

Programme interventions and impact

Initially, AKF directed its irrigation investments into rehabilitating existing infrastructure and construction of additional structures in 6 selected river- and stream-fed schemes to make them operational. These schemes were selected in collaboration with the Zonal Irrigation Unit (ZIU), LGAs and IOs and aimed to benefit farmers in growing rice and vegetables. The schemes targeted were Utimbe in Lindi Rural, Ndanda and Mkungu in Masasi, Chikoko in Ruangwa, and Liperengenye and Chikwedu in Newala. However, in order to promote the long-term sustainability of the schemes, it was critical to build both effective 'hardware' in the form of irrigation infrastructure, and 'software' through capacity building of LGAs and IOs. In collaboration with the LGAs, AKF went on to implement a number of interventions to address the deficits in both 'hardware' and 'software'. Project outcomes include:

a) Irrigation 'hardware' development:

In collaboration with the ZIU and District authorities, AKF conducted land surveys to determine the land coverage of each scheme and identify where further irrigation structures needed to be built in order to increase irrigated land under cultivation. Each scheme varied in terms of need: a total of 4 weirs (intake structures) were rehabilitated in Ndanda, Mkungu, Chikoko and Liperengenye, 2 new weirs constructed in Utimbe, and a total of 10 gates fixed at Utimbe, Chikoko and Mkungu schemes. In Ndanda, 2 major challenges existed: silting


COMMUNITY-BASED MANAGEMENT OF SMALL SCALE IRRIGATION SCHEMES

SOFTWARE DEVELOPMENT

- Formation of the ISTT*
- Needs assessment, development of capacity building plan and training manual for IOs
- Training of ISTT (by AKF)
- Maturity assessment of IOs
- Training of the IOs by the ISTT in parallel with development of operations and maintenance tools
- On-going support by the ISTT to IOs
- Maturity assessment of IOs (annual)

HARDWARE DEVELOPMENT

- Infrastructure needs assessment and survey of schemes
- Contracting of and implementation of civil works for infrastructure development
- Oversight of civil works by District Irrigation Engineers and IOs
- Completion of civil works and handover to IOs

* key stakeholders include ZIU, LGA, IO/ Community, and AKF

ISTT members include Community Development Officers of LGA, District Irrigation Technicians/Engineers, and Government Agricultural Extension Officers and AKF field staff. AKF facilitates the ISTT.
resulting from upstream activity and land ownership. The project invested in desilting Ndanda river, training the river course and, in Ndanda and Mkungu schemes, facilitated scheme plot layout and plot distribution to IO members. Desilting covering 2.15 kilometres of the main canal was also carried out in Liperengenye, with over 3,500 cubic metres of wet sand removed. 149 canal-related structures (distribution boxes, check drops with stoplogs, and aqueducts) were constructed in the six schemes. The total length of constructed, rehabilitated, and excavated unlined and lined drainage canals is approximately 10,000 metres. These investments built on the initial irrigation structures established by the LGAs prior to this project. In each district, a Memorandum of Understanding was signed between AKF and the District Agriculture, Irrigation and Cooperative Officer (DAICO), and IOs were responsible for mobilising local materials and labour to contribute to the construction and rehabilitation efforts. IOs also formed project committees to monitor the implementation of civil works by the contractor.

b) Irrigation ‘software’ development:

Although ‘hardware’ development was only undertaken in 6 schemes, AKF invested in IO capacity building in 7 schemes because members of an additional IO in Lipalwe demonstrated commitment and interest for such support. Overall, membership of the 7 IOs exceeded 1600, with a minimum of 68 and a maximum of 536 members per IO. 36% of members were women and all IO boards comprised both men and women. In order for the IOs to proactively engage in the management of their schemes, it was necessary to facilitate interventions in collaboration with the government. The process was initiated with a capacity assessment of each IO, which identified critical gaps in the competencies required to manage, operate, and maintain the schemes. In order to measure change against the initial assessment results, the project designed a tool to conduct follow-ups on IO’s maturity after capacity building. AKF developed a comprehensive IO training manual in collaboration with the IOs, the ZIUs and the DAICOs to complement irrigation training guides developed by the Japanese International Cooperation Agency (JICA), which was also working in collaboration with the government to construct schemes. Multi-sectoral Irrigation Scheme Training Teams (ISTTs), comprising of LGA Community Development Officers, Irrigation Technicians/Engineers, and Agricultural Extension Officers and Agronomists, were then formed and trained in all 7 schemes and the associated districts. The ISTTs delivered 7 training modules to each IO. In collaboration with the LGA, AKF mobilised members in the 7 schemes and trained and mentored them over a 2-year period. As a result, all 7 schemes have in place functional management committees and operations and maintenance tools such as annual work plans, constitutions, scheme calendars, water distribution plans, meeting schedules, scheme registers, and receipt books; 4 of the schemes now have bank accounts. Further, AKF facilitated the registration of 2 cooperatives as IOs and supported other IOs which were registered but inactive to revitalise their operations. In parallel, AKF continued to train farmers in the scheme area on good agricultural practice, especially on integrated rice management, and supported them to link with buyers through formation of producer marketing groups.

Capacity building is a dynamic process and requires varied mechanisms. Following training sessions of IOs, there was continued follow up, mentoring and ongoing support as well as facilitation of exposure visits to irrigation schemes within and outside LMR for farmers, LGA staff, ward and village agricultural extension officers, scheme managers, and ISTTs. As a result some IOs, on returning to their bases, set out to improve on their collective actions on canal maintenance, while others took steps to ensure increased usage of uncultivated land in their schemes. AKF also worked through and strengthened the capacity of irrigation scheme managers in order to ensure continued support to the IOs in conjunction with the DAICOs. These concerted efforts have seen the IOs promote collective actions on land and water management in their schemes. Over 500 collective actions, with an average of 40 percent member participation, were conducted and recorded in the 7 schemes over 5 years.

AKF interventions in this regard have resulted in the rehabilitation and extension of water-related infrastructure serving an estimated 877 hectares. A number of farmers that were members of IOs reported 2 to 3-fold increases in rice yields. Additionally, the intervention has enlightened the IO members on their roles and opportunities to engage with different stakeholders
for influencing, problem solving and resource mobilisation. For example, two IOs successfully influenced government to grant them substantial funds from the District Irrigation Development Fund administered by the Ministry of Water and Irrigation (TSh 400 million to one and TSh 200 million to the other), leveraging on AKF’s investment. The fact that all schemes now have functional management committees and operational management tools, which they did not have 2 years ago, is a major score. However, AKF’s global irrigation experience from Afghanistan, India, and Kenya has shown that building the capacity of such civil society organisations to function independently is a long-term process requiring over 10 years of ongoing support.

Lessons learned

Sustainable and inclusive water management is fundamental to increasing agricultural productivity and reducing smallholders’ vulnerability to climate change effects. AKF applied a community-based water management approach that focused on building the capacity of IOs and LGAs to sustainably manage the schemes. Community-based water management is based on the recognition that water is primarily a community resource and it is therefore critical to give local water users the opportunity and means to engage in its management. These community-based institutions will complement broader water resource management frameworks and play an important role, through collective actions, in the maintenance of physical water supply infrastructure and monitoring of water supply and its usage. In this context, AKF has learnt that investment in the ‘software’ development is as important as investing in good ‘hardware’ development. For future schemes, it would be useful to integrate the capacity building of IOs in plans for irrigation scheme development from the beginning so that IOs are fully involved in the design, construction and operation phases.

A holistic approach to water access and management that combines community-based water management, promotion of good agriculture practices and links to markets has the potential to yield higher returns on investments in irrigation. This ensures that access to water is effectively utilised by farmers to improve agricultural productivity and incomes – which in turn increases the ownership and value of irrigation schemes among farmers as well as enhances their financial ability to maintain the schemes, contributing to a ‘push’ effect for agriculture production. Further, the linkage to buyers and a market complements with a ‘pull’ effect to match demand to supply and increase economic opportunity.

As the long term sustainability of irrigation schemes also requires managing upstream and downstream issues, water catchment and watershed management is critical for IOs. This is evident from AKF’s work as rehabilitation of several schemes was exclusively aimed at addressing the silting resulting from upstream activities. Deforestation and inadequate maintenance of water sources upstream massively erodes the life of schemes and undermines investments made. However, the challenge lies in how to operationalise the management of water catchment areas for sustainability of the schemes as this goes beyond the physical location of the scheme and the remit of IO members. As well, such issues often surface over a longer time frame. Addressing such upstream and downstream issues may require the support of the local government and the ZIUs and guidelines to address the issues. The National Irrigation Act 2013 (Part VI, section 28.1 f & g) includes actions such as ‘Creating awareness on integrated water resource management’, and ‘formation of apex forums of IOs to enable them to have effective representation of scheme management into the river basin management sub-system as provided for in the Water Resource Management Act’. As noted earlier, AKF’s experience of 25 years in irrigation from Afghanistan, India and Kenya suggests that irrigation interventions are long-term endeavours, requiring at least 10 to 15 years to complete necessary infrastructure and to build the capacity of IOs to effectively fund and manage their schemes.

AKF’s global experience in irrigation suggests that capacity building of the community to effectively manage water resources requires targeted training of community-based organisations over a longer period of time as well as connecting these organisations to relevant government actors and platforms to access resources. This involves
mobilising the community, engaging and upskilling IOs based on need assessment, rolling out comprehensive maintenance education programmes and supporting IO’s when they are interacting with local and national governments.

An effective and functioning scheme requires heavy investment and is, therefore, expensive and complex for a single agency to implement. It will require strategic partnerships, bringing expertise and resources in varied fields to achieve success, and AKF’s expertise sits in the ‘software’ development area. PPPs, catalysed by the National Irrigation Commission (NIC) perhaps through PPP guiding frameworks specifically for partnerships at scheme level, could contribute to the successful planning, completion and sustained functioning of schemes. AKF’s model of establishing multi-sectoral ISTTs can be adapted to promote effective PPPs in the irrigation sector at the district level and below.

There is room for further institutionalised coordination and collaboration at the district level, among non-governmental organisations, LGAs, NIC, the Ministry of Agriculture, Livestock and Fisheries, Ministry of Water and Irrigation, and development partners. Coordinating mechanisms at the district level can enable investments in irrigation infrastructure to be complemented by effective capacity building of IOs, resulting in optimal utilisation of resources.

The Aga Khan Foundation, an agency of the Aga Khan Development Network, is a private, not-for-profit, non-denominational, international development agency established in 1967 by His Highness the Aga Khan. Working in 19 countries, with special emphasis on the needs of rural communities in mountainous, coastal and other resource-poor areas, AKF seeks to provide sustainable solutions to long-term problems of poverty, hunger, illiteracy and ill health in the poorest parts of South and Central Asia, Eastern and Western Africa, and the Middle East. Its activities are coordinated not only with those of other AKDN agencies but also with local, national and international partners in order to bring cumulative impact that can spark a long-term process of positive change. The Food Security and Incomes project referred to in this brief was implemented in strategic partnership with the UK Department for International Development (DFID) to positively impact the food security and income of households in southern Tanzania.

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