Case Title: Supporting a second annual crop with seepage wells (Mkwaira, Malawi)

What is the general context in which the story takes place?

In recent years, India has seen a transformation in its agricultural capacity, driven to some extent by 'frugal innovation': inventive, low-cost solutions to improve agricultural performance and tackle the constraints faced by small-scale producers. These often originate outside of traditional research and development settings; incorporate traditional techniques, methods and materials; and are designed to meet the needs of smallholder farmers at scale.

As part of the Feed the Future (FtF) India-Africa Agriculture and Natural Resource Management (NRM) Innovation Sharing Platform program, USAID/India is supporting TechnoServe, together with partners GRAVIS and Catholic Relief Services, Malawi (CRS), the local African Innovation Adopter (AIA), to transfer one such frugal innovation – seepage wells. The overall goal of the Innovation Sharing Platform is to improve productivity in target value chains, increase resilience to climate change, and improve nutrition for target households.

Using this integrated and community-driven model of water conservation and NRM in agriculture, the well updates traditional Indian techniques with modern technology – targeting FtF zones of Malawi. Mkwaira was the first village targeted for this innovation transfer. This village is located in Dedza district, and the land is mainly used for agricultural purposes.

The Mkwaira village was established in 1928, when people from Mozambique migrated and settled down in the area due to famine. The community suffered natural disasters such as storms and floods, as well as diseases such as chicodola and cholera. The first bore-hole was built in the 1970's and the introduction of irrigation farming happened in 2008.

What was the main challenge/opportunity you were addressing with this CLA approach or activity?

Challenge: Limited prior exposure to / awareness of techniques to manage ground-water, and limited capacity to manage this resource. This constraint had trapped agriculture in the community at a subsistence level, as it remained completely dependent on rains. This largely mono-cropped area hardly provided sufficient inputs to feed the local community, and hence families believe that their main problems are (i) food insecurity and (ii) lack of water for irrigation.

Average landholding was approximately a tenth of a hectare per household, which when entirely rain-fed yielded barely enough food for the household, and did not generate enough surplus to encourage the building of sustainable longer-term water-utilization structures. The community grows only one crop a year, timed for sowing in the local rainy season.

Opportunity: The village is located near the confluence of three rivers, and even though water is not immediately visible at the surface in the immediate area, a very significant, relatively easily accessible body of ground-water is available. Ground-water has been struck at depths of no more than around 5 to 15 feet, which would be considered shallow and relatively easy to access in many other environments. Hence, a number of affordable interventions are possible, which can help address the challenges identified.

Describe the CLA approach or activity employed

Before our intervention, the Mkwaira community had tried to use underground water by digging small water structures; however their size and depth were not sufficient to add significantly to water availability. They had also tried to divert water from the nearby river, but this effort was also unsuccessful.

By using a demand-led approach, driven by the needs the community, the consortium was able to pair challenges with cost-efficient Indian innovations, to provide a solution with a high chance of success.

After the initial visits and discussions with the community, a consensus was developed that promoting more systematic use of ground water, through low-cost structures built using largely natural materials (to help keep costs, as well as environmental impact, low), would help to develop irrigation in Mkwaira. Although the community was already using underground water, this had been done in an ad hoc manner that had not necessarily been

effective or efficient in leveraging available water, or in developing long-lasting water-usage structures.

Several village meetings were conducted under the chairmanship of the Traditional Leader in the village. In these meetings, TechnoServe explored the main sources of irrigation, as well as their size, and proposed some improvements that were endorsed: primarily, to build a number of seepage wells up to 15 feet deep, sited for easy access throughout the community. In the following meeting, all community members participated and agreed to the number and location of the structures to be built. It was estimated that 10 seepage wells would be required to ensure proper irrigation to all community members' land. This measure increases the total irrigated area in the village from zero to 26 hectares.

In order to provide knowledge and prior experience to this project, an Indian Knowledge Partner (IKP), GRAVIS, visited Malawi to survey the land. GRAVIS is a development organisation with a long track record of developing water structures in India, based on the Gandhian philosophy of self-reliance that works toward the rehabilitation of drought-affected and marginalised rural communities, enabling village ownership and control over its environment, institutions, and relations.

GRAVIS visited Mkwaira, confirmed the initial diagnosis, and provided on-site training to the community, including guidance on how to construct the wells, what materials to use, and how to maintain them once built. This training was critical in order for the village community to have all structures completed by the end of October (in time for the rainy season).

In addition, each planned well was mapped to a well group, representing the households that would benefit from that well.

During the construction of the first seepage well, a Participatory Rural Appraisal (PRA) was conducted by CRS staff and government extension workers in the area. Government employees, as well as the staff of local and foreign NGOs, spent a week living with the community, during the PRA. The main objective of this PRA was to help the Mkwaira community articulate and prioritize their challenges and opportunities, and generate locally-owned solutions to their problems. The tools used in the process included: social and resource mapping, Venn diagrams, wealth ranking, the seasonal calendar, historical profiles, focus group discussions, objective trees, transect walks, problem trees, preference and pair wise ranking, and a planning matrix. As a result, the community saw their challenges in a different light, and understood how simple water conservation structures could help address their challenges.

Were there any special considerations during implementation (e.g., necessary resources or enabling factors)?

The village community faced some particular challenges, which were overcome while constructing the seepage wells:

- During the initial digging process, water recharge from the ground-water was so high that the wells started to flood, even before they were complete. It was difficult to remove the water manually, and construction had to be suspended temporarily. This problem was solved when the USAID/India AOR sanctioned a pump to evacuate water during the construction process. This pump will be used by the 10 seepage well groups which have been established in the community, who will pay the operation and maintenance charges of each well.
- The lack of stones for lining the wells, and lack of experienced artisans: Although the construction materials used for the wells were largely natural and local, materials such as stone for the lining, and manpower skilled at using such material, were not easily available. The project with difficulty sourced one semi-trained mason during the initial stage of construction, and that fact that there was only one delayed the completion of the first structure. The desired amount of gravel needed for the construction was difficult to arrange as most gravel is still collected manually, resulting in high cost and low availability. The unavailability of semi-polished stone near the construction site was also a constraint.
- Finally, in a relatively minor challenge, the pump procured did not work properly during the first days because a pipe was slightly cracked, and had to be replaced.

What have been the outcomes, results, or impacts of the activity or approach to date?

TARGET OUTCOMES

The main goal for this project is to ensure 0.1 hectare for each household will be adequately irrigated for the planting and harvesting of a second crop each year. (It may be relevant that much of the success of the Green Revolution in India, from both food security as well as nutritional points of view, has been attributed to the development of the practice of planting and harvesting multiple crops in the year.) The crops will be chosen in a participatory manner, and a complete package of best practices for the second crop will be provided to the community by CRS and TechnoServe. This will start the practice of second crop within the village and the cultivation area should increase.

The seepage wells will be used to provide irrigation to crops after the rains. Crop production is currently entirely dependent on the rains. The seepage wells will mitigate this dependency, and help alleviate challenges that farmers currently face.

IMPACT TODAY

Although well construction is still in progress, the project has already made some impact upon the community.

The PRA activity, which was a first for the community, helped its members to improve their own self-awareness of their constraints and opportunities, and also helped local government and NGOs develop their understanding of the community. The village has prepared its first social map, which locates all houses, rivers, plantations, and other community assets, as well as a resources map, a wealth ranking and a historical profile where all important events in the community since it was created were reflected. The PRA

also helped Mkwaira to discuss their main problems and possible solutions in an open and transparent way.

What were the most important lessons learned? `

Learning is never a one-way process.

The trade-off between different factors of production can sometimes be very different, between Africa and India - at the most basic level Africa has more land, fewer people per capita; Indian solutions sometimes need to be modified to take into account the availability of much larger tracts of land, and more constrained availability of labor.

No matter how important an external facilitator believes its intervention is for the community, it is imperative to maintain flexibility to work with village communities – particularly considering scheduling.

Even a highly positively-inclined community has to be continuously monitored while construction is taking place, for conformance to schedules.

At the time of on-site training, most of the community members were present, and did not seem to worry much about lost wages. This suggests that they see value in the knowledge that was being imparted as part of the process.

Finally, the project has generated was a degree of community harmony and joy, visible particularly when USAID AOR visited the area. The entire village followed her from the road to the meeting venue, dancing and singing songs. This reinforces the development view, that whenever selected interventions are in line with the communities' needs, they participate fully in the process.

Excavation of soil to form the well.

Laying the stone to form the interior structure of the well.

The pipes allow for seepage water to enter the well from the sides.