IRRIGATION SYSTEMS AND COMMUNITY DEVELOPMENT IN ZAMBIA

Agricultural production serves as the economic backbone of Zambia’s working population, with nearly half of the country’s working population employed in the agricultural sector.¹ This is also the case in Chingola District, where people rely heavily on subsistence and limited commercial farming to provide food security for their households.² Little to no access to proper irrigation, however, severely limits farmers’ outputs, and by implication, how they can support their families.

Chingola District also happens to be where Outreach International’s Zambian Program Partner, Outreach Zambia Participation Program (OZPDP) has formally supported local communities since 1996. Similar to OI’s other international locations, such support includes the establishment and development of local community-based organizations (CBOs) and strong leadership. It is through such CBOs, their leaders, and the application of participatory and community-led development that sustainable development can take place.

Alongside community members, one of the very first things OZPDP facilitators do is to identify issues affecting families social and economic wellbeing. Since most CBO members are also farmers, it came as no surprise that issues of low crop yields and food insecurity surfaced as their most pressing concern. Community members also recognized how low yields and food shortages are linked to other challenges. For example, families often pull their children from school to help fetch water to irrigate the crops. Not only is this bucket system very labor intensive, but it also disrupts children’s school attendance, which in turn, impacts their education.

¹ (World Bank, 2020)
² (Chingola District Investment Profile, 2016)
MOVING FROM ISSUE TO SOLUTION:

Treadle Pumps

To identify their issues is only the first step in communities’ quest to address their poverty-related challenges. The next step is identifying appropriate solutions and in the case of OZPDP supported CBOs such solutions reside with an affordable, effective, and durable irrigation system. In this case, treadle pumps presented a unique solution. Treadle pumps are not only inexpensive, but also easy to install, operate, and maintain. They function by using a manual suction pump atop a well to draw groundwater to the surface. Additionally these pumps are not only cheaper than usual pumping mechanisms, such as diesel and electric options, but also easy to repair. Since local communities can manage and fix their treadle pumps, they no longer depend on external organizations to respond to maintenance issues.

With such information in hand, and with OZPDP’s assistance four CBOs decided to develop proposals to request funding for treadle pumps. They finalized these proposals, including well developed implementation and management plans and submitted these to relevant funding institutions. Since the first successful proposal and subsequent funding in 2014, the CBOs continued with their funding requests. Up-to-date they have successfully accessed 50 treadle pumps for farmers in the communities of Chamata, Kapisha, Tuilange, and Tunfwane.

Most importantly, however, is the step-by-step process the CBOs from these communities followed in accessing their treadle pumps. This included a close analysis of their most pressing issues, identifying most suitable solutions for these issues, and developing corresponding implementation and management plans to oversee the ongoing success of such solutions. It is because of this process and their use of continuing management plans that the four communities continue to see increases in their annual crop yield. Whereas they never had fields under irrigation, they now have the infrastructure capacity to irrigate a total of 24.6 Ha (60.8 acres), which has resulted in annual crop yield increases of 63%. Such increases not only result in higher household income but also greater food security. Moreover, five years after the first installations, the pumps continue to provide families with the much needed irrigation to sustain their

3 (International Development Enterprises, n.d.)
101 families who use treadle pump irrigation

50 Treadle pumps installed

24.6 Ha under irrigation

101 families who use treadle pump irrigation

63% increase in annual crop yield

CBOs in focus:
Muchinshi Organized Group, Kapisha Organized Group, Tuilange Irrigation Group, Tunfwane Organized Group
MORE THAN IRRIGATION:

Four Ways Treadle Pumps are Positively Impacting People’s Quality of Life

Similar to other projects managed by the Zambia-based CBOs, the treadle pump projects bring more value than just reaching its primary objective, i.e., increasing crop yield. In this case, there are at least four additional ways treadle pumps have improved CBO members’ quality of life.

1 | Treadle Pumps Save Time

The treadle pumps’ implementation revealed just how much time goes into gardeners’ usual watering methods. Previously, farmers would carry water to their field in 20-liter containers, which requires a great deal of time. The time and labor costs of manual irrigation often prevent people from spending time on other income-generating activities, household management tasks, community gatherings, or enjoying much-needed rest. Additionally, parents often keep their children from school so they can help fetch water, which means they lose out on their education. In Tuilange, for example, treadle pumps are giving people their time back and making a drastic difference in their everyday activities. As Mercy Mpashi, a leader from Tulange Irrigation Group, shared:

“I would wake up early in the morning to go and water the garden with the use of buckets. It took me 6 hours to finish watering the garden. But with the use of treadle pumps things have greatly changed as it takes me less than 2 hours to water my garden.”

The pumps have reduced what used to be the full-time job of at least two people, to the part-time job of only one. What once seemed like a distant hope - to have irrigation that requires less time and strenuous labor - is now within reach.

2 | Treadle Pumps Save Labor

Watering gardens can be back-breaking work. Before accessing treadle pumps, households commonly used 20-liter buckets to carry water from nearby streams to their gardens. The intensity of such action would, of course, depend on how far the closest water source is. In the case of Kapisha, the community’s main source of water for gardening is the Luano stream. Depending on how many people help, it can take Kapisha gardeners between two to three days to carry water from the stream to their gardening lots. During dry seasons it takes even longer because people would have to either walk further up or downstream to look for water pools. Bucket irrigation is therefore both a time-consuming and labor-intensive job.
Treadle pumps have however significantly lessened gardeners’ labor load. The pumps come with a simple pipe system that connects the gardens with nearby streams. By simply treading the pump, water now comes to their gardens, instead of gardeners having to go to the source. Gardeners are very well aware of the ease and convenience of the pumps. “Since we received this treadle pump, watering has been easy,” a Muchinshi gardener shared. “It takes us about 90 minutes to water an area which took us two days previously. This machine is so good and easy to use, even my grand-children are able to use it.”

In turn, the pumps also save gardeners time but also alleviates them from the physical burden of carrying water buckets to and from their gardens. As Mr. Sinkala of Kapisha shared: “I never used to sleep without using pain killers because of the pain of using 20-liter buckets when watering, but now [because of the treadle pumps] I sleep as if I have not even worked during the day!”

### Yield Increases, Food Security & Additional Income

Since the CBOs in Kapisha, Muchinshi, Tuilange, and Tunfwane accessed treadle pumps, their gardening practices have changed in three ways: First, they no longer depend only on rain cycles for growing crops. With readily available treadle pumps they can now irrigate during dry seasons. While year-round cultivation is, of course, dependent on the levels of nearby streams these hardly run completely dry. Second, access to more efficient and time-saving irrigation means bigger gardeners. Because of the time and labor constraint previously going into watering their gardens, gardeners had to keep their lots to a manageable size. However, with access to easier and more effective irrigation gardeners can consider expanding their gardens. Last, with irrigation no longer being so time and labor-intensive, gardeners have more time to tend to their bigger gardens and thus the capacity to consider a more diverse range of crops, including those with higher market value. For example, all 30 Kapisha households who use treadle pumps have grown higher quantities of tomato, a crop of high value in local markets. With access to better irrigation, expanding their lots, and investing in more diverse crops, it is no surprise that gardeners have seen better yields.

For local families, better crop yields mean two things:

1. **Greater access to quality food**

   Before malnourishment and stunted growth were common amongst children in the four communities. Irrigated gardens are changing this with more families now enjoying three meals per day. Additionally, increases in diverse crops mean a greater range of vegetables and thus even more nutritious meals.
2 | Household Incomes

Better crop yields mean that households not only have enough food for their families but now also have vegetables to sell. As one community member shared:

“I can simply say things are changing in my life. I never knew that this will come to reality but it has happened; now I have been given a source of income...Today marks the day of my new life through the use of this treadle pump.”

Access to additional income means that households can spend more on things like immediate household needs and their children’s education. But extra income also increases households’ purchasing power which stimulates local small businesses and encourages the emergence of new entrepreneurs.

4 | Community-led Development means Sustained Irrigation

Gardeners in Muchinshi, Kapisha, Tuilange, & Tunfwane would probably not have gained access to treadle pumps if not for the actions of their CBOs and leaders. Even more important, without their local organizations, who would have taken ownership of the management and maintenance of the treadle pumps? Who would have decided over the sharing of the pumps between gardens and whether the pumps are not mismanaged? With the support of OZPDP facilitators, the four CBOs who accessed treadle pumps developed systems and policies to manage their treadle pumps. This includes criteria on who can use the pumps, who takes care of the pumps, and what will happen if the pumps need repairing. Similar to other community-led initiatives, organizational structure and management are essential to the sustainability of projects and by implication, the continuous alleviation of poverty-related issues. While one might see the pumps’ benefits in the gardeners’ crops, their increases in food security and also household income, the true change resides with the CBOs and their leadership. By successfully implementing and sustaining an irrigation system, these CBOs and their leaders now have the capacity and courage to take on new projects in their respective communities. Since the implementation of the treadle pumps the CBOs in Muchinshi, Kapisha, Tuilange, and Tunfwane have built latrines, constructed hand washing stations, supported upcoming tailoring businesses, engaged in organic farming and started feeding programs. A total number of 52 households in Muchinshi, 66 in Kapisha, 71 in Tuilange and 55 in Tunfwane regularly attend community meetings during which they elect their leaders, discuss challenges facing their respective communities. Most importantly they collectively seek solutions for such challenges that are not only appropriate but also specific to their respective contexts. Such collective thinking and doing is central to the progress the CBOs in Muchinshi, Kapisha, Tuilange and Tunfwane make toward improving the lives of those in their communities.