

# Drip Irrigation Practices

## by Pastoralists in Miyo District, Ethiopia

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**Crop production based on seasonal rains is unevenly practiced in pastoralist and agro-pastoralist areas. In these areas the livelihood of most of the inhabitants is predominantly dependent on livestock rearing. However, the traditional pastoralist way of living is constantly hampered by recurrent drought and weather variation increasing community vulnerabilities to adverse climatic conditions. The net effect of all this is declining productivity of crops, exacerbating food insecurity, and death of livestock due to shortage of water and feed. Under such circumstances, the proper utilization of water obtained from rain, surface and underground supplies, and ponds is of utmost importance.**

As such, with the rising frequency, duration, and severity of drought in the Miyo district of Borana Zone in Ethiopia, it was difficult for communities to respond to the problem by resorting to ordinary irrigation schemes. It became imperative to recover water from ponds with the community's own skills and the available material and financial means.

The idea of using small-scale drip irrigation came up after the implementation of a Participatory Disaster Risk Assessment (PDRA), and was proposed as a solution to get alternative food sources and income.



## Description of drip irrigation experiences

In line with the PDRA findings, facilitated by the Agency for Co-operation and Research in Development (ACORD) and the Partners for Resilience Project (PfR), one of the response measures brought to the attention of communities was drip irrigation. This efficient water technology enables crop production under increasing water scarcity and erratic climatic changes. However, it was considered risky because it encouraged the production of vegetables in a situation where water is as scarce as gold. Therefore, the technology is believed to threaten the quantity of water consumption for human and livestock. However, the training and practices of water-efficient drip irrigation finally changed the attitude of the community.

<sup>1</sup> **Drip irrigation** works by distributing water directly to the soil at a very low rate (in gallons per hour) from a system of small diameter plastic tubing fitted with outlets called emitters or drippers. It is water highly efficient because the water soaks into the soil before it can evaporate or run-off. The water is also applied close to the plant root zone providing a high moisture level in the soil in which plants can thrive.

ACORD facilitated the formation of two drip irrigation<sup>1</sup> groups in 2013 in two PAs (Pastoralist Associations), with 20 members (13 men and seven women) in each. The communities selected members by setting criteria such as: jobless youth; low-income households; and goodwill to participate in group activities. The Miyo District Pastoralist Development Office (PDO) was instrumental in granting production land of 0.5 hectare to the groups at selected potential irrigation sites with technical support centering on operation and maintenance.

The production of vegetables was made possible by the group's establishment of drip irrigation systems fed by water captured in big ponds. The ponds have a capacity of holding more than 10.000 cubic meters. These ponds can help support the harvesting of vegetables at least twice a year, with low water requirements, thus producing fresh vegetables, especially during times when food shortages are high. These groups were initially supported with drip irrigation sets



of materials, vegetable seeds, working tools and a water tanker for operating the production. Simultaneously, a series of theoretical and on-site trainings were given to members, thus transferring knowledge and skills for operating and maintaining the drip irrigation system. Land and seedling preparation, watering, harvesting techniques, marketing and vegetable consumption were complementary trainings given by experts from the district government.

The drip irrigation is operated by gravity with a water tanker (5 cubic meters) installed at a one meter height to allow gravitational movement of water and water outlets at every vegetable's roots. Water is extracted from the pond by a motor pump supported by ACORD. The community members are required to fill the tanker from nearby water pond once a week, in rotation, an activity that takes up to thirty minutes. The group members also monitor the proper functioning of the drip daily.

Drip irrigation supporting vegetable production is playing a crucial role in changing the fundamental nutrition pattern and benefits of the communities of concern through creating access to income and food. In the past, vegetable and root crop production and consumption were not common in the locality. Most importantly, they had limited knowledge of cooking and consuming vegetables such as cabbage, onions, tomatoes and sugar beet and especially root crops such as beet roots. These seed sources can easily be purchased from district town, Hidilola, 17 kilometers away.

The produce is mainly sold to nearby villages and district town Hidilola. Annually, each of the two groups makes a total sale of ETB 80.000 (USD 4.000) per year after producing twice per year. Each group member gets, in addition to their own household consumption, an income approaching USD 100 per year. The incomes generated are used for supporting family needs such as medicines, school materials for children, and improving the housing condition.

Now, the trend of vegetable and root crop production, consumption and marketing has dramatically changed among the producers and the people in the surrounding areas. Finally, the people's skeptical notion about drip irrigation is changing.

The demand for vegetables from the nearby village community is growing, as there is a change in community attitude towards consuming vegetables. The woman purchasing, Qabale Dhiba from Miyo Arda Jila PA shared,

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*"I am proud to get fresh vegetables and root crops from my near with fair price. We used to see vegetables only at district town and previously not familiar to consume. But now, it becomes my family's favorite to consume so frequently and the production is not meeting the demand"*

The reflection of Qabale explicitly signifies the attitude change in regards to vegetable consumption has been towards increased consumption. This indicates the demand side of vegetable consumption has increased thus motivating producers to expand further.



## Results from PfR Miyo drip irrigation

Motivated by the benefits, other group members are operating drip irrigation. Twenty people in two groups, are expanding to support eighty members.

There have been attitudinal and practice changes in utilizing the opportunity of water. Labor efficient drip irrigation is creating income as well as a direct food source under conditions of growing water scarcity. There are skills transfer in operating the drip system, water application, agronomic practices, cooking and marketing of produce.

The project has attracted regional and district government officials contributing to the government Growth and Transformation Plan (GTP) of the district, which is in line with government emphasis on small scale irrigation adoption and expansion.

Optimizing water conservation and use in the environment of growing water scarcity, drip irrigation, has so far created jobs for at least 80 youths, supplied fresh vegetables, helped the generation of income, and saved labor and time in operation.

From practicing drip irrigation, the members are able to adapt to the changing climate through new livelihood activities and dietary changes. In addition, there is a reduction of soil erosion, contributing to a healthier ecosystem. Pastoralist communities, with scarce water could now produce and consume fresh vegetables and generate income. This initiative is linking climate change to disaster risk reduction measures through creating more resilient ecosystems.



## Lessons learned from Miyo drip irrigation

- Involving the government from the very beginning in the PfR project is a success factor assuring that the government remains motivated to continue to incorporate the scaling up of drip irrigation as part of their plan. A second lesson learned was that introducing new approaches requires strong understanding and confronting challenges to succeed. Communities initially tend to trust only when presented with visible success.