



# 1 SMALL-SCALE IRRIGATION

**SMALL-SCALE IRRIGATION IS A CLIMATE-SMART AGRICULTURE PRACTICE THAT ENABLES FARMERS TO INCREASE THEIR INCOMES AND IMPROVE THEIR RESILIENCE. THE DEVELOPMENT OF SMALL-SCALE IRRIGATION SYSTEMS (COVERING LESS THAN 200 HECTARES) IS A POLICY PRIORITY IN ETHIOPIA FOR RURAL POVERTY ALLEVIATION AND GROWTH (MOFED, 2006), AS WELL AS CLIMATE ADAPTATION (GOE, 2007).**

## **RATIONALE FOR IMPLEMENTING SMALL-SCALE IRRIGATION**

The project area has been severely affected by recurring climate shocks, which have negatively affected the livelihoods of farmers who are dependent on rainfall for agricultural productivity. The project aimed to build the resilience of farmers to climate shocks and changing weather patterns by enabling them to switch from subsistence rain-fed farming to commercialised smallholder farming.

The project enabled smallholder farmers in the arid target woredas of Meskan, Sodo and Mareko, Arba Minch Zuria, and mid-temperate woredas of Hadero Tunto Zuria and Boloso Bombe to increase the productivity of high-value crops throughout the year and increase their families' food security through a series of interventions including support for irrigated vegetable farming.

The project introduced small-scale irrigation systems, which allowed smallholder farmers to start producing crops year-round and harvest two to three times a year. This supports the first and second Sustainable Development Goals (SDG 1 and SDG 2), focused on ending poverty and hunger respectively, which aim to move communities from reliance on safety net programmes to becoming food-secure.

The irrigation schemes are diversion canals on surface water and use motorised pumps for groundwater. As well as covering the costs of the initial investment and infrastructure of the schemes, the project trained farmers and Development Agents (DAs) in irrigation agronomy and multi-cropping, and offered technical support and support in organising irrigation groups and cooperatives.

## **CLIMATE-SMART AGRICULTURE**

The five-year Improving Smallholder Livelihoods through Climate-Smart Agricultural Economic Development project aimed to alleviate poverty and build resilient, sustainable livelihoods in Ethiopia's SNNP and Oromia regions.

Funded by Irish Aid, a consortium of SOS Sahel Ethiopia, Self Help Africa, Vita and Farm Africa worked with more than 50,000 households, with a particular focus on poor farmers, women, children and landless youth. This booklet is one of a series of seven focusing on each of the project's key components:

1. Small-scale irrigation
2. Cooperative-based seed multiplication systems
3. Mango value chain development
4. Ecosystem-based adaptation to climate change
5. Engaging women in entrepreneurial farming businesses
6. Promoting CSA through revitalising Farmer Training Centres
7. Promoting fuel-saving stoves

## RESULTS

The project helped 5,386 (28% female) households produce vegetables using small-scale irrigation systems in semi-arid agro-ecology Woredas of Meskan, Mareko, Sodo, Gumer, Abeshige, Hawasa Zuria, Wondo Genet, Wondo, Boloso Bombe, Arba Minch Zuria and Mirab Abaya as well as in mid-temperate agro-ecology of Hadero Tunto Woreda. In total, these farmers irrigated 2,084 hectares of farmland to grow tomatoes, onions, cabbages and sweet potatoes.

The total production and profitability of the irrigated farms was much higher than rain-fed production, mainly due to the production of high-value crops and application of improved production techniques on the irrigated farms (see Tables 1 and 2).

## PRODUCTIVITY OF RAIN-FED VS IRRIGATION-FED FARMS

**Table 1: Production costs, productivity and profitability of producing major rain-fed crops in Meskan, Sodo and Mareko woredas between 2017 and 2018.**

Rain-fed major crops	Average harvest on 0.5 hectares of land (Quintals)	Production cost (Birr)	Average market price per quintal (Birr)	Total price (Birr)	Net profit (Birr)
Maize	30	4,218	500	15,000	10,782
Teff	9	4,000	1,500	13,000	9,500

**Table 2: The production costs, productivity and profitability of producing vegetables using small-scale irrigation systems in Meskan and Sodo woredas between 2017 and 2018.**

Irrigation-fed vegetables	Average harvest on 0.5 hectares of land (Quintals)	Production cost (Birr)	Average market price per quintal (Birr)	Total price (Birr)	Net profit (Birr)
Tomato	280	70,000	700	196,000	126,000
Onion	120	20,000	600	72,000	52,000

## POVERTY REDUCTION

In the above woredas, 71% of farmers (non-safety net farmers in the PSNP) engaged in small-scale irrigation earn between €983 and 5,563 per season and the remaining 29% of the farmers (safety-net PSNP farmers) earn €55-836 per season from 0.5 hectare of irrigated land. This income is considerable in the context of Ethiopian farmers. Increased incomes have enabled smallholders to strengthen their asset base, build their resilience to climate shocks, invest in their children and decrease animal mortality. Farmers engaged in the schemes were able to increase their savings in the bank, and construct houses in nearby cities.

## EMPLOYMENT OPPORTUNITIES

Producing vegetables using small-scale irrigation systems is more labour-intensive than rain-fed cereal farming. Every hectare of irrigated land has created an average of 150 man days' work per season for casual labourers, including women, young people and landless youth.

In the sample area, the going day rate for labour, for men and women is ETB 70 (€3). Women also increased their incomes by selling high-quality vegetables to traders and selling lower quality crops locally.

In addition to day labourers, most farmers hired skilled irrigation technicians from other areas, paying up to ETB 1,000 (€33) a month, plus food, for their services. In total, the participant farmers created employment opportunities that injected ETB 16.7 million into the local economy.

## BENEFITS TO FAMILIES' DIETS

The small-scale irrigation schemes contributed to the significant diversification of household diets in the localities by enabling communities to consume vegetables such as Irish sweet-fleshed potatoes, which are high in protein and carbohydrates. Linked to the project's cookstove initiative, cooking demonstrations focused on diversified food intake contributed towards increasing households' food security.

## SCALING UP OF THE IRRIGATION PRACTICE BY OTHER ACTORS

The project's small-scale irrigation scheme has been scaled up by the government, other NGOs, individual farmers and private land owners in Meskan, Mareko and Sodo woredas. To date, more than 27,000 hectares of land have been transformed from rain-fed to irrigation, increasing households' food security.

## SETTING UP AND SUPPORTING FARMERS' COOPERATIVES

The project organised farmers in 15 woredas into 17 primary vegetable producers' cooperatives and supported them to access water-lifting technologies, vegetable seeds and extension services in irrigation agronomy. They are also linked to two cooperative unions to get access to credit and other markets. The project:

- Targeted food secure farmers with the capacity to diversify and increase production, as well as poor farmers who jointly purchased a water pump using a smart subsidy received from the project. The selection process was made in collaboration with kebele-level and woreda-level government organisations.
- Organised selected farmers into vegetable producing groups to make technology sharing easier. The groups consisted of five to ten neighbouring farmers. Working with local technical colleges, the project also organised landless young people into groups. Once established, these groups were then incorporated into existing agricultural cooperatives, or given support to establish new cooperatives. The project supported this transition by helping producers join cooperatives or paying the registration fee necessary to form a new cooperative.
- Cooperatives provide farmers with credit to purchase agricultural inputs, labour and equipment, such as water pumps. Cooperatives are attached to unions who purchase seeds, fertilisers, herbicides and other agricultural inputs in bulk. Unions issue these inputs to cooperatives who then distribute them among their members on credit. This project worked with relevant unions to set up a revolving fund to finance the purchase of agricultural inputs.
- Over the course of the project, 153 subsidised water pumps were distributed to farmer groups at 50% of market price in the first year of the project, and 40% in the second and third years. Group members split the cost of one jointly-owned water pump. In total, 977 households received subsidised water pumps on a group basis.

When project staff first met Adamo Awano, he was in a difficult position, **“My income and yields were very low. I wasn't earning enough to feed my family. So I migrated to other areas in search of work, but I still struggled to earn enough to provide for my family.”**

After encouragement from Farm Africa, Adamo decided to stay with his family and joined a training course on irrigation, vegetable production and soil and water conservation. Equipped with new skills and access to a water pump, he started producing cabbages, tomatoes, carrots, onions and ginger. Adamo employed crop disease management techniques to protect his crops from disease and pests.

From just one harvest, Adamo earned ETB 10,354. He plans to build upon this success by investing in improved seed and fertilisers. Adamo no longer worries about feeding his family: he now provides them with a balanced, diverse and nutritious diet.

**“Since my income has increased”, Adamo reports, “I am able to repay my loans and my acceptance in the community has improved. I will continue investing in irrigation. I don't have to leave my family any more in order to find a job.”**





## KEY LESSONS

- ▶ Integrating small-scale irrigation interventions with value chain development and marketing concepts is essential as the products are perishable and relatively high cost.
- ▶ Working in partnership with stakeholders such as Development Agents (DAs), other government departments, research centres and the private sector has helped to scale up the technology to more farmers. Involving multiple stakeholders across multiple activities has shown faster results.
- ▶ Frequent follow-ups and support services are vital in terms of controlling diseases, introducing improved technologies, such as solar pumps and drip irrigation, and solving second generation problems like groundwater augmentation.