

# 2 FRUIT AND VEGETABLE PRODUCTION

## INCREASED ACCESS TO WATER HAS ENABLED FARMERS TO GROW A VARIETY OF FRUITS AND VEGETABLES AT HIGHER PROFIT MARGINS AND WITH HIGHER NUTRITIONAL VALUE.

Central to Farm Africa's work in Tigray was the aim of restoring the region-wide watershed, to support efforts to reduce poverty and improve food security. Our work included integrated watershed management and small-scale irrigation (covered in papers 1 and 6 respectively), which helped poor families to increase fruit and vegetable production. This paper focuses on tomatoes, onions and mangoes, that were the basis of an intensive value chain assessment undertaken in the final year of the project.

Our support given to vegetable production was closely linked to our support to farmers to put in place small-scale irrigation. A total of 73kg of vegetable seeds were distributed to 658 households, and 200 households received an average of six hand tools each. A number of fruit seedlings were given out: 2,260 grafted mango seedlings, 886 avocado seedlings and 4,000 papaya seedlings were given to 301 households. However, it could be some time (in the case of mangoes at least three years) before these fruit trees start to produce at a high enough scale to generate sufficient income. The seeds, tools and seedlings were accompanied by intensive agronomy training given to 851 farmers, in conjunction with the local extension officers (Development Agents).

A survey of participating farmers indicated that farmers earned a gross margin per year of ETB 9,666 (c £348) per quarter of a hectare of tomatoes grown and sold, and ETB 3,880 (c £140) per quarter of a hectare of onions produced and sold. All the farmers growing tomatoes and onions do so on plots of less than one hectare, and on average, tomatoes and/or onions generated approximately 35% of total household income.

The local tomato and onion markets are both strong and despite seasonal variations in prices, it is always possible for margins to be generated. However, the extent of post-harvest loss and wastage indicates that significantly higher prices could be achieved if quality was better managed and if farmers aggregated their produce and sold it together in bulk.

## SUSTAINABLE AGRICULTURE FOR IMPROVED FOOD SECURITY IN TIGRAY, ETHIOPIA

Land in Tigray's rugged mountains is scarce, and many farm sizes are very small. Many women, especially widows, and young people who have little access to land struggle to produce enough to feed their families. With funding from Irish Aid and the UK Department for International Development, Farm Africa worked directly with nearly 6,400 women and landless young people in Tigray's Ahferom woreda, providing them with the knowledge and skills to successfully bolster their food security and incomes through farming and rearing livestock.

This booklet is one of a series of six focusing on each of the project's key components:

1. Integrated watershed management
2. Fruit and vegetable production
3. Poultry production
4. Goat and sheep rearing
5. Honey production and marketing
6. Small-scale irrigation



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# LESSONS LEARNT: TOMATOES AND ONIONS

Very real constraints to productivity exist for the farmers we worked with in Tigray. Low yields are constraining the growth of onion and tomato markets and hindering households' ability to grow and consume more, adding to their food security.

When surveyed, on average 63% of tomato and onion farmers complained that their principal challenge was diseases or pests, closely followed by a lack of appropriate technology and limited land. Overall, land availability is a constraint beyond the control of any one development organisation, and therefore the critical challenge is to improve productivity. Irrigation and soil fertility management was one major input of the programme to this, but the following gaps remain:

Crop	Average yield in Ahferom, Tigray in 2016 (a drought year)	Optimal yield
Tomatoes	6,500 kg / hectare	18,000 kg / hectare
Onions	4,080 kg / hectare	18,000 kg / hectare

## LACK OF ACCESS TO HIGH-QUALITY SEED

A value chain study conducted by the project noted that seed provision by the Regional Bureau of Agriculture and Rural Development is insufficient, and collaboration with the private sector to import and distribute seeds is at a nascent stage. Many farmers already buy from the private sector, but are demanding a stronger regulatory function by the Bureau. In particular, many tomato farmers buy 'gelira' seeds from Sudan, which have a poor germination rate, necessitating farmers to buy double the volumes.

## LOW ADOPTION OF TECHNOLOGIES

Despite the best efforts of the National Research Institute for Tigray, and Mekelle University, there is limited action research or outreach to farmers on adoption of technologies, either for better productivity or better post-harvest handling. Some farmers in Ahferom lose up to 20% of their total onion crop due to wastage. Nor do these institutions have strong capacity in variety testing and adoption. Simple technologies that are ripe for testing and adoption include simple low-cost greenhouses, shade nets for drying, charcoal refrigeration, and plastic field crates, as well as field level tools for production purposes. There is also more work to be done on maximising the effectiveness and cost-efficiency of small-scale irrigation programmes.

## KNOWLEDGE GAP

Field-level extension workers (Development Agents) do not have adequate knowledge about the agronomy of vegetable growing, which the programme could only partially address. Also, there is limited outreach by local extension agents to women farmers, which constrains productivity further.





**“My father and my mother are often sick and too old to work and feed a family of eight. There was little to eat and going to school was unthinkable for me as our parents became older. My father had about 0.4 hectares of land near a pond the regional government’s Water Resources Development Office had built for local people to harvest rainwater. I planted vegetables and tried to use the water from the pond to water the vegetables, but that was too time-consuming and laborious.”**

**“Things changed dramatically when Farm Africa provided a water lifting motor pipe for us ten farmers who have plots of land suitable for irrigation. Farm Africa gave us training on how to grow vegetables using irrigation and how to operate the motor pump. I started growing varieties of vegetables including garlic, onion, tomatoes, cabbage, spinach, beetroots, carrot and peppercorns. I have sold vegetables for over ETB 10,000 in one year alone and still have vegetables worth ETB 15,000 at home. I’m now supporting one of my brothers to continue his education.”**

**“Our life has improved a lot in the past year. Our food has become more delicious and more nutritious as we consume varieties of vegetables. We also now eat three times a day.”**

**– Aregawi Gebremeskel, Tahitay Megari Tsemri Kebele, Liham, Tigray (pictured left)**

## **LESSONS LEARNT: MANGOES**

The mango industry in Ethiopia is still in a nascent state, even more so in Tigray, where the area devoted to mango cultivation is just 3% of that in Oromia and SNNPR. That said, the prospects look good for mango production and sales in Ahferom, given significant local demand (currently being met by farmers closer to Makelle and beyond), and given the multiple options for adding value (drying, juicing and pulping). The vast majority of mango farmers in Ahferom have planted the apple variety of mango, which is the most suitable for juicing.

Authorities and communities in Ahferom now need to plan for the upcoming supply of mangoes that will come onto the market in the next two to three years. Support to establish SMEs for mango processing in Enticho will generate a steady stream of demand, and encourage other farmers to make the long-term investment in growing mango trees. The government nursery at Enticho has limited capacity for seedling production, and needs to be supplemented with the establishment of additional nurseries, ideally with the right support to groups of landless young people. Technical knowledge needs to be built on the agronomy of mango, at farmer, Development Agent, and private sector level, working with the Farmer Training Centres.

# BRINGING FARMERS CLOSER TO MARKETS

We found that the tomato, onion and mango markets are buoyant, and are likely to grow, although they could function better. The key constraints to the growth of these crops as viable income generation options are productivity, input supply and the strength of support to farmers. Mango represents a significant opportunity for value chain development, as well as job creation in processing.

Across all value chains in the project area, there are two major trends that need to be addressed by future investments. One is the relatively low level of farmer cooperation for the market. We observed a tendency for tomato and onion farmers to take their produce to market individually and sell to individual consumers (as much as 80% of their yield can be sold this way). This incurs direct and indirect costs to these farmers, and eliminates their bargaining capacity. It also makes collaboration on post-harvest storage and transport non-existent. Future food security interventions should support farmers achieve economies of scale by aggregating their produce and selling it collectively.

However, work is needed to build the effectiveness and transparency of operation of primary and secondary aggregators, as well as other market actors such as input providers. Lastly, investment is needed in market infrastructure at local level in Enticho, to avoid further wastage and spoilage.



## RECOMMENDATIONS FOR FUTURE INTERVENTIONS

- Work more closely with National Research Institute and Makelle University on improving farmers' adoption of technology and access to seed, liaising closely with the private sector.
- Work with Regional Bureau of Agriculture and Rural Development to better regulate private sector seed suppliers, and build the capacity of the seed suppliers.
- Tailor better focused crop extension services to women farmers, and include women more in irrigation endeavours.
- Help build farmer organisation and strengthen linkages with primary and secondary level aggregators.
- Address post-harvest losses and wastage, helping farmers to generate higher yields and achieve higher prices.

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