



**A farm at Abraha we Atsbaha locality, Tigray Region, Ethiopia**  
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**Agroecology in Practice Program**  
**E-case: Hailemariam Farm at Abraha we Atsbaha locality, Tigray**  
**Region, Ethiopia**

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# I. ETHIOPIA

## 1.1 General information



Ethiopia is the ninth largest and the third populous country in Africa. It is located in East Africa. The population of Ethiopia in 2010 was about 79.4 million, with a density of 101.3 people per square kilometres. The climate is tropical. The farmland is about 65% of the total geographical area. Agriculture contributes 43% of GDP in 2008/09 as opposed to more than 80% few decades ago.

**Area:** 1.14 million km<sup>2</sup>

**Geographical location:** 3<sup>o</sup>15' N-15<sup>o</sup> N latitude & 33<sup>o</sup> E-48<sup>o</sup> E longitude

**Farm land area:** 11.8 million ha

**Highest elevation:** 4 620 m

**Population:** 79.4 million in 2010 (50.4% male & 49.6% female)

**Population density:** 101.3 per km<sup>2</sup>

**Climate:** Tropical

**GDP per capita (real):** 217 USD (2008/09)

**GDP growth rate:** 11.2% in 2008/09 & 6% for agriculture

**Rate of gross savings (as % of GDP):** 20% in 2008/09

**Rate of investment (as % of GDP):** 22% in 2008/09

**Macro-economic activities (sectors):** Agriculture-43%; Industry-13%; Service-45% in 2008/09

**Source:** Central Statistical Authority (CSA), *Ethiopia*

## 1.2 Tigray State

### 1.2.1 General information



Tigray National Regional State is one of the states in Ethiopia located at the Northern tip of the country. Tigray State's climate is tropical. It is the fourth populous state in Ethiopia, with a population of 4.66 million in 2010. The farmland is 22.8% of the total area, that is, 1.22 million ha & the average farm size is about 1.15 ha. The relative importance of the agriculture sector is declining from time to time.

**Area:** 53,638 km<sup>2</sup>

**Geographical location:** 12<sup>0</sup>15' N-14<sup>0</sup>57' N latitude & 36<sup>0</sup>27' E-39<sup>0</sup>59' E longitude

**Population:** 4.66 million in 2010 (49.2% male & 50.8% female)

**Population density:** 55.1 persons per km<sup>2</sup>

**Climate:** Tropical

**Major economic activities:** Agriculture-36.4%, followed by service & industry sectors

**Major agricultural products:** Cereals, pulses, oil seeds, and livestock products

**Source:** Central Statistical Authority (CSA), Ethiopia

### **1.3 Ethiopia's Agriculture**

In Ethiopia, agriculture, mainly rain-fed, provides the major source of the GDP (43%), export revenue (90%) and employment (85%). Being a predominantly agrarian economy underlines the country's heavier dependence on natural resources. Though the majority of the working force is engaged in agriculture, increasing food insecurity and hunger have been very common phenomena in Ethiopia until recently. The expected backward and forward linkages have been weak for agriculture to be the engine of growth in Ethiopia though there are promising changes in recent years. Low productivity and the drive for survival led to severe degradation of the environment and the resource base reinforcing negative environmental effects. Until recently, this has been contributing to the problem of a self-enforcing vicious circle of low productivity, land degradation and poverty. However, due to good government policies there are major improvements to these.

Pursuant to the global initiative to reduce poverty, the government has adopted a poverty reduction strategy that is primarily rural-centred. The goal is sustainable rise in agricultural productivity through promotion of green-revolution type technologies coupled with natural resources rehabilitation and conservation.

The economy of Ethiopia in general and Tigray in particular mainly depends on agriculture, which is very sensitive to climatic variations. The large part of the country and the region is arid and semiarid and is highly prone to desertification and drought. It has a fragile ecosystem, which is currently under stress due to shortage of water, population pressure and other factors. Forest, water and biodiversity resources are also climate sensitive. The country has experienced environmental problems such as recurring droughts,

high rates of deforestation, soil degradation and loss, overgrazing etc, which may be exacerbated by climate change.

Some of the causes contributing to the food insecurity included the long-term civil war, low land productivity, deforestation, soil erosion due to poor land management, population pressure and other natural calamities. Long drawn extensive agriculture in the northern highlands has led to deforestation and soil erosion. Environmental degradation in Ethiopia is also serious and the causes are largely human-induced in character. For a long time there has been widespread and indiscriminate clearing of forest and open woodlands.

The size of the farmland in Ethiopia is in the order of 11.81 million hectares in 2010, which stands at 65 percent of the total geographical area of the country. The contribution of agriculture to the Gross Domestic Product (GDP) was 43.2 percent in 2008/09. While its export share stood at 90 percent, with a total export value of 1.41 billion USD in 2009. On the other hand, the import of agricultural products was 10.9 percent of the total value of imports (7.22 billion USD) in 2009.

As to the geographical distribution of farm types, the smallholder farms, which cover majority of the land, are located everywhere. There are big farms in the Northwest, Southern, Eastern and Central Ethiopia. The major agricultural products of greater significance to the economy are coffee, cereals, pulses, oil seeds, fruits, vegetables, livestock and livestock products.

## 1.4 Tigray Region's Agriculture

Tigray Region, which covers about 53.6 thousand km<sup>2</sup>, has a population of over 4.6 million, which is predominantly rural and engaged in subsistence rain-fed agriculture. Agro-climatologically it is classified into *kola* (lowland) 53 per cent, *woina dega* (midland) 39 per cent and *dega* (high/upper land) 8 per cent where temperature ranges 4<sup>o</sup> to 40<sup>o</sup>c. The altitude range for the upper highlands is from 2300-3000 m.a.s.l (meters above sea level) and the majority of the lowland has an altitude range between 500 and 1500 m.a.s.l. Rainfall is erratic and is highly variable both temporally and spatially. Annual rainfall is about 450 to 900 mm at an average.

The region has a total arable land of 1.22 million hectares, which constitutes about 22.8 percent of its total geographical area. At present, about 0.92 million hectares of the total area (87.5%) is estimated to be under cultivation. The regional average size of holding is 1.15 hectare per household. So far the area under irrigation is estimated to be about 1.0 per cent of the arable land.

Agriculture is the main stay of the economy. It is largely small holder based characterized by mainly traditional use of hand tools and farm oxen. Total crop production as well as productivity per unit area has suffered from dwindling land holding size, fertility loss and traditional farming. It is noted that this sector contributes about 36 per cent of the Gross Regional Domestic Product (GRDP) although 83 per cent of the region's population are engaged in and dependent on this sector. Tigray is one of the regions, which experienced high frequency of manmade and natural calamities.

Tigray is one of the most drought prone and food insecure regions of Ethiopia. The climate of Tigray is mainly semi-arid and most of the region experiences scanty, erratic and inadequate rainfall that remains insufficient for crop production. Recurrent droughts and famine were recorded many



times in the past 30 years and drinking water for humans and livestock is a big problem. The effect of changing rainfall patterns is especially notable in the shortening of the growing season, up to the point that the risk of crop failure increases dramatically if no supplementary irrigation is available.

The region's agriculture, which is based on plough cultivation of predominantly cereal crops, has been overrun by various problems. The major problems and constraints in the sector include: erratic and unreliable rainfall; serious environmental degradation and natural resources depletion; low capital; land fragmentation; low crop and livestock productivity; and vulnerability to plant and livestock diseases. The sector has been excessively dependent on seasonal rainfall. But rainfall has, in many instances, been inadequate to sustain crop growth and animal husbandry.

With respect to the geographical distribution of farm types, the region so far has predominantly smallholder agriculture. But there are also big commercial farms in Western parts of the region. The major agricultural products from the region are cereals, pulses, oil seeds, livestock and livestock products.

## **1.5 Government (Agricultural) policy**

Government policy on agriculture encourages both smallholder agriculture and commercial farms. It gives due focus primarily to food security and poverty reduction while maintaining the natural resources base. It is mainly rural centred. The government of Ethiopia, among many others, has the following two policies and strategies:

### **a) Agriculture Development Led Industrialization (ADLI):**

The government of Ethiopia adopted ADLI policy in the early 1990s. The smallholder farmers were taken as the focus of economic development with massive agricultural extension and credit schemes

along with the expansion of primary education, primary health care, rural water supply and rural roads. Extension of credit to the smallholder farmer gains in importance with commercialization of agriculture. Industrialization is the other arm of ADLI strategy, which is interwoven with the development of the private sector. ADLI enhances export orientation. This leads to growth of income and foreign exchange: eventually the country is tuned to the global economy.

### **b) Rural Development Policies and Strategies:**

The second most important policy package, which goes hand in hand with the ADLI, is the policy and strategy package ardently pursued and referred to as Rural Development Policies and Strategies. The rural and agricultural development policy has eight major components. Some of the components are building the human capital and making extensive use of it; making appropriate use of agricultural land; agro-ecology based agricultural package; and market-led agricultural development.

Recognizing the strategic importance of achieving food security at regional and household levels, the regional government of Tigray has targeted on rural development, in general, and agriculture, in particular. Central to this strategy is enhancing the productivity of the small farmers who contribute almost the entire total agricultural output of the region.

### **Subsidies**

Regarding subsidies the government of Ethiopia and regional governments at times subsidize, for some time, while new technologies are introduced and subsidizes price and transportation of inputs in special cases only.

## **1.6 History and development of the organic sector**

The development of organic agriculture in Ethiopia is a recent phenomenon but there are no records to indicate the development history of the activity. Some studies though show that organic agriculture started in Ethiopia few decades ago. This portion will be updated as and when relevant data and information is collected.

## **1.7 Government support and control**

Generally the government, both at Federal and Regional levels, support the expansion and development of organic agriculture and it is also encouraging farmers, though different means, to convert their activities towards organic farming.

## **1.8 Facts and figures on the organic sector**

At present there are no compiled data on the organic sector. But efforts will be made to have some facts and figures of the organic sub-sector as it may give an insight into how it should be implemented, managed and evaluated.

## **1.9 Regional climate**

In most parts of the country rain falls in the main rainy season that spreads between June and mid September. Day and night have almost equal duration of 12 hours except in few months in which either day time or night exceeds by about 15 or so minutes.

## II. THE FARM

### 2.1 The farm at Abraha-we-Atsbaha, Tigray, Ethiopia

#### 2.1.1 Introduction:

<b>Farm name:</b>	-
<b>Farm size:</b>	1.5 hectares (0.5 hectares of this is leased-in)
<b>Farmer and family:</b>	Husband Hailemariam Alemayehu & wife, 3+2 children living with them
<b>Location:</b>	Mendae <i>kushet</i> , Abraha-we-Atsbaha locality, Kilte Awlaelo sub-district, Eastern zone, Tigray region, Ethiopia. <a href="#">Watch video of the region here.</a>
<b>Farm type:</b>	Organic farm (75%), non-organic farm (25%) crop production, animal husbandry
<b>Soil type</b>	Predominantly sandy
<b>Mean annual rainfall</b>	450-750 mm
<b>Mean annual temperature</b>	12- 27°C
<b>Livestock husbandry</b>	Cattle, poultry
<b>Plant production</b>	Maize, <i>teff</i> , finger millet, wheat, barley, vegetables and fruits
<b>Marketing</b>	Purchase inputs from nearby stores and selling produce in the local market; marketing facilities are improving
<b>Human activities on farm</b>	Farmer visits from other areas

## 2.1.2 History of the farm

### 2.1.2.1 *Owning the farm and farming*



Mr Hailemariam Alemayehu is the head of this particular household living in Mendae sub-locality, Abraha-we-Atsbaha locality, Tigray region, Ethiopia. He is 55 years of age, whose education level is grade two. His occupation is farming only and manages a family of 7 members. The total land holding of the farmer is 1.5 hectares out of which 1 hectare (67%) is owned by him and has land certificate to use it for life. The remaining 0.5 hectare is a leased-in one.

With respect to the land use, the farmer grows cereals such as maize, *teff*, finger millet, wheat and barley; fruits such as orange, mango, and lemon; vegetables such as onion, tomato, and pepper. He grows trees for sale to increase income. The combination and cropping pattern of these, change every time depending on season and availability of water. He also rears livestock in a very small scale. The household uses a family labour of 3 people, who are the household head, his wife and the eldest son. The farm does not hire labour. The major sources of energy for this household are fuel-

wood, charcoal and biogas. The main monetary source of the farmer is his 3 plots and the livestock and, his major expenses are consumables.

As indicated earlier, all of his 3 plots of land are located not far away from his home. The farthest plot is 5 minutes walk and has irrigation facilities, with vegetables and fruits dominating the fields. Using irrigation he is able to produce 2-3 times per year from the same field. The other two plots are close to his homestead.

#### *2.1.2.2 Converting to organic farming:*

Mr Hailemariam Alemayehu had no idea about organic farming until very recently. He started organic farming in 2008. The major inputs he uses for the purpose are organic manure, compost and crop remains, and these are applied on 75 percent of his owned land. He said that the yield he is getting from organic farming is better than that from inorganic fertilizer as the latter needs plenty of water to be more effective. Water is a scarce resource in the region in general and the area in particular. The farmer does not keep records on farm yield he has been getting from both organic agriculture and inorganic farming. However, during the 2010/11 agricultural year, he witnessed a yield difference of 4 quintals per hectare in favour of organic farming (he managed to get 500kg as opposed to 400kg from a 0.25ha plot of land). He strongly opines that if properly managed the yield using organic inputs is much better, with strong advantages of rehabilitating and protecting the natural resources and the environment.

At present he is one of 15 model farmers in his sub-locality, *Mendae*, who are proponents of organic farming and the future looks bright for them. His and the agriculture fields of other model farmers now are used as demonstration fields by extension agents so as to extend such practice to neighbouring farmers. This is one strong indicator that organic agriculture is getting

momentum and would cover majority of the land under cultivation in the near future in the locality and other places. The locality that Mr Hailemariam is living, Abraha-we-Atsbaha, is one of the very few model areas in the region as well as the country and it is known for its integrated agro-ecological practices, management and prudent use of natural resources.

### **2.1.3 Livestock production**

Mr Hailemariam, a model farmer in his locality, owns one cross-bred cow, one heifer, 2 oxen, 8 poultry and 3 donkeys. The feed sources for the livestock are hay, grass, crop residue, sesbania and leucenia trees grown at the perimeters of his plots. The other source for animal feed is the common grazing land, which is allowed for oxen only for the reason that oxen are heavily needed for ploughing and land preparation.

Well, so far, what the farmer is getting from the existing livestock he owns is just 4 litres of milk per day during milking; about 25 eggs per month per hen and animal dung to be used for manuring and for biogas. He is planning to purchase dairy cows and more poultry to get better income without affecting the natural resources and without violating the strategy that the locality administration implements. At Abraha-we-Atsbaha locality destocking (keeping fewer numbers of livestock) is being implemented as one livestock management mechanism, which is meant to lessen the burden on grazing lands and other natural resources. The farmer, as is also common in the locality, uses cut-and-carry system to feed the livestock.



Mr Hailemariam's cattle & his son (left); and, Poultry (right)



Grazing land belonging to the community



## 2.1.4 Buildings and machinery

### 2.1.4.1 Buildings



Homestead of Mr Hailemariam Alemayehu

Mr Hailemariam has a residence building and sheds for agricultural production and management purposes. He has 2 corrugated iron sheet roof living rooms; one other small room as a store; 2 cattle sheds; and, 1 shed for storing manure. He has also water wells constructed using stone and cement and mainly used for irrigation to produce vegetables and fruits.

By the locality's standards Mr Hailemariam's houses and sheds are said to be better than most of the houses nearby. In the short and medium terms he has a plan to have better buildings, including cattle sheds and modern poultry sheds.



Water well (left); cemented living room (centre); and, light from biogas (right)



Cattle shed-left & right of the front house (left); and, biogas ingredients mixer (right)

### 2.1.4.2 Machinery

Most of the farm and field activities are carried out with the farm's own equipment. The farm owns a water pump and water hose for irrigation and supplying water for domestic purposes; wheel barrow to transport agricultural inputs and outputs in the farm fields; donkey drawn cart to transport agricultural inputs from their source to his home and agricultural output to the market. He has also biogas equipment and produces electricity mainly for lighting. Moreover, he also owns farm implements and hand tools such as hoe, spade, sickle, etc.



Farm implements (left); generator (center); and, water hose (right)



One very important equipment that the farmer, Mr Hailemariam, owns is a water pump with accessories used mainly for irrigation purposes. He produces vegetables 2-3 times a year from the same plot and it has become one major source of income to the household. The income from such harvest is mainly spent on clothing, schooling expenses to kids, and other basic commodities.

### **2.1.5 Manure handling and storage**

One major source of organic fertilizer applied by the farmer is manure collected from cattle. Manure is collected and stored in a shed before it is transported and applied to the field. Manure is applied to vegetables and fruits using simple tools. Part of the manure is also spread and ploughed in fields to grow cereal crops.

## 2.1.6 On-farm work and employment

### 2.1.6.1 Farm work and workload

So far, the farm employs family labour only. The entire farming activities are managed by Mr Hailemariam, his wife and the eldest son. At the agricultural peak season, where the biggest workload occurs, the family works at least 12 hours per day, that is, from 6:00 am in the morning to 6:00 pm in the late afternoon. The major agricultural activities for crop production are land preparation, sowing, planting, irrigating/watering, fertilizing, weeding, harvesting, threshing and bagging, transporting produce, etc. For livestock husbandry the activities are feeding, cleaning shed, milking, animal health follow up.

The farmer starts planning of production and buying of important inputs and seeds starting in March, before the main agricultural season comes, while for the irrigated agriculture these activities start as early as October. Preparing the plots of land and seeding is the next activity in the cropping calendar. Depending on weather sowing of some cereal crops begin in mid June and planting of vegetables in November. The staple crop, *teff*, is sown in late July. The household practices irrigated agriculture during the dry season, between December and April.

The workload of household members reveals that the wife is working all year round while the males are very much active for about 10 months. The division of labour, in terms of seasonal calendar is displayed in the following Table (Table 1)

**Table 1:** Seasonal calendar for major activities of the household

<b>Description</b>	<b>Male (Husband)</b>	<b>Female (wife)</b>
<p>A. Summer activities: Early morning to noon, afternoon and evening</p>	<ul style="list-style-type: none"> <li>• Feeding cattle</li> <li>• Ploughing</li> <li>• Giving feed &amp; water to cattle</li> <li>• Ploughing</li> <li>• Participating in meetings</li> </ul>	<ul style="list-style-type: none"> <li>• Waking up early morning &amp; fetching water</li> <li>• Milking cows</li> <li>• Preparing food &amp; coffee</li> <li>• Helping out in the field</li> <li>• Caring children</li> </ul>
<p>B. Autumn &amp; Winter activities Early morning to noon, afternoon &amp; evening</p>	<ul style="list-style-type: none"> <li>• Feeding cattle</li> <li>• Harvesting crops</li> <li>• Giving feed &amp; water to cattle</li> <li>• Participating in meetings</li> </ul>	<ul style="list-style-type: none"> <li>• Waking up early morning &amp; fetching water</li> <li>• Milking cows</li> <li>• Preparing feed &amp; coffee</li> <li>• Caring &amp; sending children to school</li> <li>• Managing home</li> <li>• Helping out in the field in weeding, irrigating</li> </ul>

Also, the general cropping calendar for the farmer is given in the following Table (Table 2).

**Table 2:** General crop calendar

Description	Months
Land preparation	October (irrigation), January (irrigation), may and June
Sowing time for majority of rainy season crops	May and June
Sowing time for crops like <i>teff</i>	July and August
Planting time for vegetables	October, January
Weeding	July, August, September
Harvesting of cereal crops, pulses, oil seeds, etc.	October & November
Threshing	December-January

### **2.1.7 Consultancy (Extension services/support)**

The farmer gets agricultural extension and other services from development agents representing the Bureau of Agriculture and Rural Development (BoARD) stationed in the area. The extension services are based on four major components. These are: crop production, animal husbandry, natural resources management and irrigation development. There are frequent visits

by these agents to the field. These include field and irrigation planning; crop production and animal husbandry and management of natural resources. The BoARD gives extension support, including how to run organic farming and harvest organic products to the farmer under consideration, twice a month, on average. He ranks this service as “good”.

At locality level there is Farmers’ Training Centre (FTC), which is accountable for catering various trainings and field demonstration for better performance and dissemination. The centre also carries out joint arrangements for farmers covering aspects related to crop and animal production or other aspects of farming. Mr Hailemariam also participates in an experience-sharing group consisting of model and other farmers. There are regular meetings by the farmers for better experience sharing and adoption of improved inputs, systems and technologies facilitated by extension or development agents.

## **2.1.8 Non production on-farm activities**

### *2.1.8.1 About the human activities (visits) on the farm*

As a model farmer in his area and the locality, Abraha-we-Atsbaha, being a model place in the entire region and the country as a whole, many farmers from other areas visit the productive activities of the locality. Thus, the fields of the farmer are frequently visited by fellow farmers coming from other areas.

Some important lessons that visitors can get from this area are: (i) good SWC practices and well established hillside treatment; no more cutting of trees in the area now and construction of series of ponds to capture water; (ii) the natural resources in the area are rehabilitating; good practices of area closure; (iii) good cut and carry system (introduction of zero-grazing) and introduction of destocking; and, good management of grazing land; (iv)



serious commitment of leadership in the area, which helped introduce many good practices; (v) strong relationship between the farmers in the area and various stakeholders; (vi) active participation of beneficiaries and few number of holidays; (vii) active participation of women in decision making and carrying out of actual activities themselves.



Field visit & discussion with farmers

#### *2.1.8.2 Natural and landscape management (Natural Resources Management)*

Mr Hailemariam and his family actively participate in natural resources management and he is working hard to rehabilitate and protect the environment that he is in. The household performs soil and water conservation (SWC) activities, which is believed to retain both water and soil and increase productivity. The farmer also manages indigenous forests and local races to maintain biodiversity. On-field land management is also carried out regularly such as proper tillage, enhancing soil using organic manure and compost and on-field SWC.

Forests are well managed and are good sources of income. They are also important for making agricultural implements. The household has irrigation facilities and uses ground water properly to support plants, animals and is also one source of water for domestic consumption.

### 2.1.9 Crop production

As indicated earlier, the farmer has 3 plots and the dominant soil type is sandy. The major crops grown, as also indicated above, are maize, *teff*, finger millet, wheat, barley, onion, potato, pepper, orange and mango. He uses crop rotation depending on availability of water, season length, marketability of produce and land fertility.



Intercropping-crops with vegetables (left & centre); and, cereal harvest (right)

The yields of major crops grown by Mr Hailemariam, for the agriculture year 2010/11, are given in Table 3 below.

**Table 3:** Yield of major crops (2010/11 agriculture year)

<b>S. No.</b>	<b>Crop type</b>	<b>Yield (qt/ha)</b>
1	Maize	24
2	<i>Teff</i>	16
3	Finger millet	20
4	Wheat	20
5	Barley	20
6	Onion	142
7	Potato	95
8	Pepper	120

#### *2.1.9.1 Crops and their use (2010/11 agriculture year)*

The crops cultivated during the 2010/11 agriculture year are indicated on Table 3 above. The total area under cultivation during the given year is 1.5 hectares. Most of the cereals and vegetables produced have been supplied to

the local market and other nearby markets such as Wukro (capital of the sub-district, 15 km away from the locality where the farmer lives), while a smaller proportion of the produce has been consumed by the household. In fact more than 95 percent of the vegetables were sold in the market and about 5 percent consumed at home.

#### *2.1.9.2 Field plan*

As per the opinions of the farmer he does not have actual field layout, crop and other plans. He does not even write his plans, the produce he gets, income and expense. He usually considers the market and current price of inputs and outputs, availability of water, etc. Based on these he makes farm decisions. For instance he considers changing the cropping pattern for the coming agriculture year and he is planning to grow more vegetables, as the price of vegetables is higher as compared to other crops. He has though general plans for the main rainy season and for the irrigated fields during the dry season.

#### *2.1.9.3 Crop management*

Agricultural inputs such as improved seeds, manure, compost, and N-P-K fertilizer are stored in a safe, dry and cool place to avoid spoilage and damage. Crops after harvest are packed using dry sacks and other similar materials and stored in a cool and dry place. Manure and compost are maintained in a shed and well covered with plastic and other local materials.

Out in the field manure and compost are spread over the field while for fruit trees these are applied in a radius of 0.5m from the stem. For the irrigated fields water is applied according to the crop-water requirement and irrigation interval of the plant.

#### *2.1.9.4 Weed management*

There are some important weeds in the area and Mr Hailemariam uses hand weeding to get rid of these. This is one particular good practice by the farmer. Elsewhere, others use chemicals such as 2-4D Amine to eliminate weeds. In addition, he uses proper tillage, proper discing and harrowing. He also uses crop rotation as one mechanism of controlling weeds.

#### *2.1.9.5 Nutrient management*

As per the farmer's opinion, the nutrient status of the field is medium. But he always tries to enhance and maintain the fertility of soil. On 75 percent of the owned land manure and compost is applied and he applies inorganic fertilizer on the remaining 25 percent of his own land. The other aspect used to maintain soil nutrient is soil and water conservation activities.

### **2.1.10 Economy and marketing**

#### *2.1.10.1 Farm income*

The household under consideration gets income from the sale of cereal crops, vegetables, fruits and sometimes from the sale of trees. Owing to the use of irrigation, manures, compost, and then increase in price of agricultural products in recent years, the income of the farmer is increasing from year to year. The agricultural produce is sold at the market in the locality and in other bigger towns such Wukro.

#### *2.1.10.2 Farm expenses*

The major expenses of the farm are fuel (for the irrigated fields), seeds, fertilizer and transporting horticultural crops. Extension and veterinary services are given for free by the government.

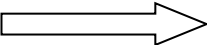
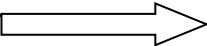
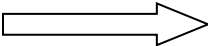
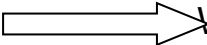
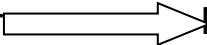
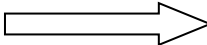
### 2.1.10.3 Marketing

Input marketing is one important aspect in agricultural production activities. The household buys agricultural inputs such as fertilizer, improved seeds from cooperatives and public stores in his locality and at Wukro markets.

The locality is connected to major towns via all weather roads and transport is available. He has also storage for both non-perishable and perishable products at his backyard. He is of the opinion that marketing of organic products is getting better and better because of colour and taste. The main decision maker is the farmer himself and he negotiates with retailers and wholesalers to get better prices for the produce.

### 2.1.10.4 Market and market opportunities

The major market actors for both inputs and outputs apart from the farmer are retailers, wholesalers, cooperative societies, and other intermediaries. The market chain in the area takes the following channels:

- Channel I: Producer  Final consumer (especially for cereals & milk)
- Channel II: Producer  Local product collector   
Final consumer (especially for vegetables & fruits)
- Channel III: Producer  Wholesaler  Retailer   
Final consumer (for pulses, oil seeds)

With regards to market opportunities, due to improvements in communication (such as mobile phones), better road networks and extension services in

recent years there are improvements in the markets. Farmers are also getting better prices and income from their produce.

The government policy and strategies encourage production and productivity and is improving marketing facilities, and in the coming five years (until 2015) the strategy of the government is to connect each locality of the country by a road. Export promotion is also taken as one strategy by the government and the farmer is considering this opportunity together with other producers.

### **2.1.11 Livelihood changes**

The farmer revealed that the livelihood of the household is improving because of changes in his farming and introduction of important agro-ecological practices. The household had a thatched roof (grass) house and this is now renovated with corrugated iron sheet; the number of rooms has increased from 1 to 3. The other assets added are water pump, biogas, and more agricultural produce in store. He has also started saving some amount of money in a bank.

### **2.1.12 Future plans and investments**

Before putting his future plans and investments, the farmer was asked about his perspectives and he talked about his strength, weakness, the opportunities and threats he may face. These are displayed in the Table (Table 4) below:

**Table 4:** SWOT Analysis by the farmer

<b>Description</b>	<b>Farmer's opinion</b>
Strength	Commitment and improved knowhow of agricultural activities and natural resources
Weakness	Some gap in getting information on markets and, input and product prices
Opportunity	Strong and continuous support from the government, and NGOs
Threat	Market challenges & problem in selling perishable products and lack of cold storage

Mr Hailemariam has divided his future plans and investments in short, medium and long term plans. He considers enhancing the irrigation activities, harvesting of more cash crops and investing the income in some other productive purposes. The household's short and medium term plans are better education for their kids, better sanitation, better housing, better use of alternative energy sources that relieve the environment, and helping other people. Likewise, his long-term plans are scaling-up of existing activities, increase income on sustainable basis and invest in towns (other businesses) when kids grow up.