RAISE-FS *woreda* profile #010

Enderta *woreda* Food Systems Profile

Population

231,475

114,815 | 116,660

Altitude

1,750 to 2,780 m.a.s.l

Diets

Predominantly grains and pulses

Food insecurity

60% **FHH** | 38% **MHH**

Food gap months

Jan ····· Dec

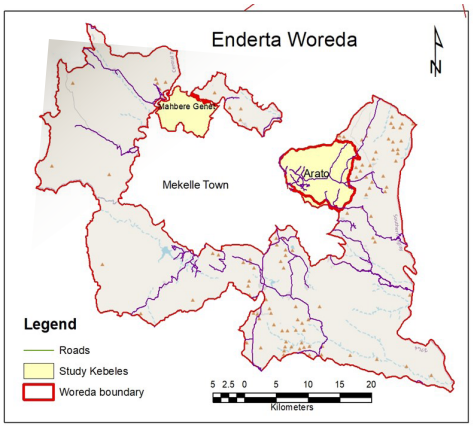
June–Sepember

Mahbere

Jan ····· Dec

July-September

Arato



Enderta *woreda*

Top 5 crops produced

wheat barley teff sorghum grasspea

Climate and soils

Soil fertility

Soil erosion

Deforestation

Land degradation

Inclusion

Youth (18–35 yrs) | Women | Men

No access | Limited access | Access

High workload during the peak agricultural months

Access to agri-inputs & extension services

Access to credit

Decision making

Job opportunities

Cooperative membership

WAGENINGEN UNIVERSITY & RESEARCH

RAISE-FS Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems

Introduction and methodology

The *woreda* profile is a document that provides an overview of the current condition, dynamics, and behaviour of the local food system in the Enderta *woreda*. The *woreda* profile was developed by the SWR-RAISE-FS project in partnership with the Tigray Agricultural Research Institute, Mekelle University, and Enderta *woreda* to let stakeholders engage in evidence-based, bottom-up planning based on the *woreda*'s current reality. The profile is meant to enable stakeholders to be on equal footing in understanding the complex challenges and realities of the *woreda*, and to use these insights as starting point for the *woreda* planning process. This document describes the current situation of the *woreda* in nine chapters. It endeavours to provide information and data on demography, agroecological and environmental conditions, production factors, markets and value addition, food and nutrition security, resilience, social inclusion as well as policies and government support areas.

This *woreda* profile was prepared using data from a baseline survey and a rapid food system appraisal (RFSA) conducted in Mahbre genet and Arato *Kebele*'s of Enderta *woreda*. The two selected *kebele*s represent the different agro-ecologies that can be found in this geographical area.

Officials from the *woreda* administration acknowledge and certify that the RFSA engaged a diversity of stakeholders, and the findings present a realistic overview representing the entire *woreda*.

Activities conducted to construct the *woreda* profile were done in light of the SWR-RAISE-FS project where the Enderta *woreda* is one of the selected implementation areas. A quantitative baseline survey and a qualitative RFSA were conducted in parallel and together with secondary data, these are the main inputs for this *woreda* profile. The selected *kebele*s were purposefully chosen because of their potential for the project commodities (food security commodities). A structured standard questionnaire and RFSA tools were developed to collect field data. Female-headed, male-headed, women in male-headed households and youth were proportionally selected randomly from the households in the selected *kebele*s. Quantitative data were collected from 106 respondents of which 38% were men, 40% women and 22% youth (of which 54% men and 46% women).

The RFSA comprised a sequence of steps and activities that consecutively build on one another to provide a diverse and integrated perspective on the current food system situation, key challenges, and opportunities (see Figure 1). The applied RFSA tools were community mapping, activity calendar, in-depth dialogue, resilient assessment, and different plate activity . The summarised findings and recommendations have been validated in *woreda* and regional workshops.[1].

[1] An extended description of the tools can be found here: https://doi.org/10.18174/590873.

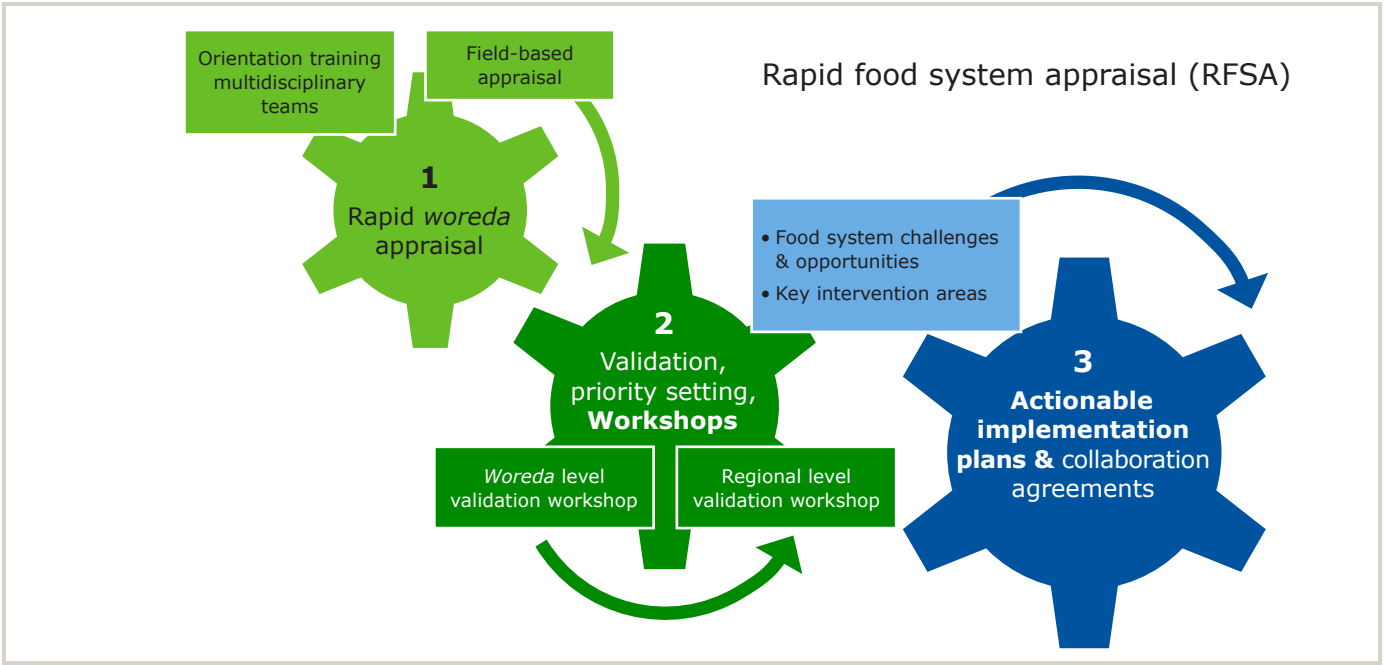
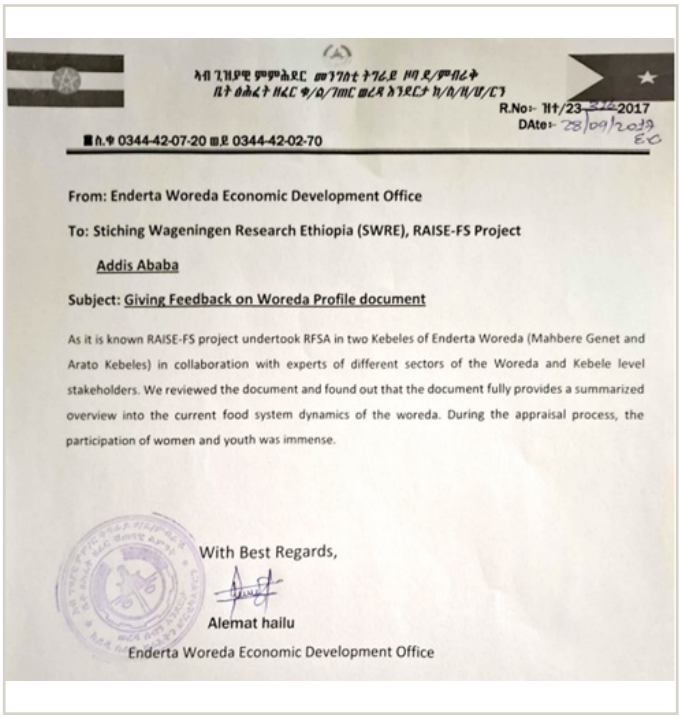


Figure 1: Steps of the rapid food system appraisal (RFSA) process

The RFSA activities involved separate groups of female, male, and stakeholders. The female group consisted of 12 individuals, including 5 youths (below 36 years old), 4 middle-aged (36 to 60 years old), and 3 elderly (above 60 years old). Similarly, the male group also comprised 12 individuals, with 5 youths, 4 middle-aged, and 3 elderly. The institutional stakeholder group included development agents (DAs), health extension workers, cooperative managers, *kebele* administration heads, land administration experts from the *kebele* level, as well as experts from the office of agriculture, cooperative promotion office, women, children, and social affairs office, trade and development office, microfinance, and job creation office.

The validation workshop was conducted with the *woreda* administrator, researchers of Mekelle agricultural research center and Mekelle University, and head of different offices of the *woreda* (agriculture, cooperative, women and youth affairs, job creation, trade and health). In addition, representatives of the men and women who participated in the RFSA were present. During the workshops, the key findings from the appraisal and baseline survey were discussed and validated. In addition, suggestions received by *woreda* official regarding the *woreda* profile (Figure 2) will be taken into consideration and added in this document.



From: Enderta Woreda Economic Development Office

To: Stiching Wageningen Research Ethiopia (SWRE), RAISE-FS Project

Addis Ababa

Subject: Giving Feedback on Woreda Profile document

As it is known RAISE-FS project undertook RFSA in two Kebeles of Enderta Woreda (Mahbere Genet and Arato Kebeles) in collaboration with experts of different sectors of the Woreda and Kebele level stakeholders. We reviewed the document and found out that the document fully provides a summarized overview into the current food system dynamics of the woreda. During the appraisal process, the participation of women and youth was immense.

With Best Regards,

Alemat hailu

Enderta Woreda Economic Development Office

Summary of the content of the letter

From: Enderta *Woreda* Economic Development Office

To: Stichting Wageningen Research Ethiopia (SWRE), RAISE-FS Project

Addis Ababa

Subject: Giving feedback on *woreda* profile document

As it is known RAISE-FS project undertook RFSA in two *kebele*s of Enderta *woreda* (Arato and Mahbere genet) in collaboration with experts of different sectors of the *woreda* and *kebele* level stakeholders. We reviewed the document and found out that the document fully provides a summarized overview into the current food system dynamics of the *woreda*. During the appraisal process, the participation of women and youth was immense.

With best regards,

Figure 2: Official communication from the Enderta Woreda Economic Development Office

Community mapping

Figure 3: Community map from Arato Kebele from Female focus group

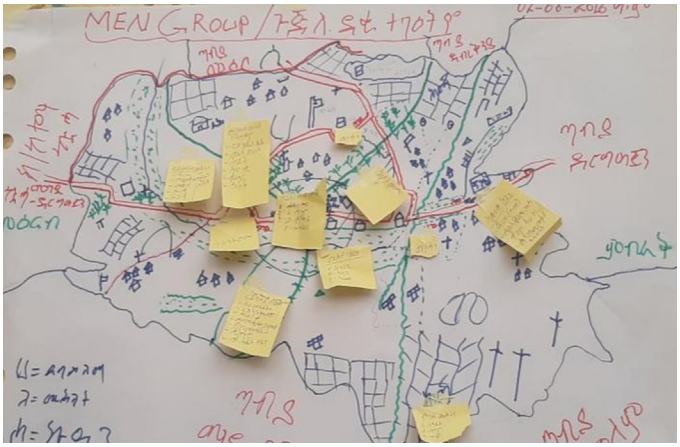


Figure 4: Community map from Arato Kebele from Men focus group

Figure 5: Joint gallery walk and sharing experiences from Mahbere genet kebele

Figure 6: Community map from Mahbere genet kebele from stakeholder focus group

Seasonal calendar

Table 1: Seasonal calendar from Enderta woreda from female focus

No	List of activities	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug
1	Expenditures distributed over the year	X				X				X	X		
2	Income spread over the year			X	X	X	X						
3	Seasonal labour activities	X		X	X					X	X		
4	High workload in different seasons	X		X	X						X		
5	The rainy seasons										X	X	X
6	Moments of critical drought								X	X	X	X	X
7	Key cropping season for different crops	X	X							X	X	X	X
8	High market price months									X	X	X	X
9	Low market price			X	X	X							
10	Busiest months of the year for women					X						X	
11	Busiest months of the year for men			X	X						X		
12	Pest and disease prevailing months	X										X	X
13	Prevailing livestock activities over the year		X	X				X	X				
14	Local market demands for local products			X	X					X	X		
15	Periods of food scarce	X										X	X

Table 2: Seasonal calendar from Enderta woreda from male focus group

No	List of activities	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug
1	Expenditures distributed over the year	X				X					X		
2	Income spread over the year			X	X	X							
3	Seasonal labour activities/			X	X						X		
4	High workload in different seasons			X	X						X	X	X
5	The rainy seasons										X	X	X
6	Moments of critical drought										X	X	X
7	Key cropping season for different crops	X	X	X						X	X	X	X
8	High Market price months	X									X	X	X
9	Low market price			X	X	X	X						
10	Busiest months of the year for women			X	X	X						X	X
11	Busiest months of the year for men			X	X						X	X	
12	Pest and disease prevailing months	X											X
13	Prevailing livestock activities over the	X	X	X	X						X		
14	Local market demands for local products			X	X					X	X		

1 Demography

Enderta *woreda* located in Tigray's Southeastern Zone surrounding the regional city of Mekelle. According to data from the *woreda* Economic Development office, the *woreda*'s population is about 231,475 (with 116,660 male and 114,815 female). It also reported a total of 42,704 households, with 34,572 male headed households (MHH) and 8132 female headed households (FHH).

The survey indicated that in the two *kebele*s. Male-headed households (MHH) have a size of seven family members on average while the median female headed households (FHH) have a slightly smaller size of four person (Figure 8). As illustrated in Figure 9, about 54% in the MHH and 51% in the FHH are children (< 18 years old) and about 21% in the MHH and 23% in the FHH are youths (18 to 35 years old). Adults (36 years to 60 years) account for 21% of the population while elders (over 60 years old) account for fewer than 5% of the total population. The education level of the heads of the HH's (Table 3). About 65% of female and 45% of male household heads, respectively, are unable to read and write. Of those who can read and write, 34% (37% MHH and 29% FHH) completed primary school, 5% high school, and 3% (MHH) hold a diploma. About 10% of the MHH have adult/religious education. school, but none of the FHH.

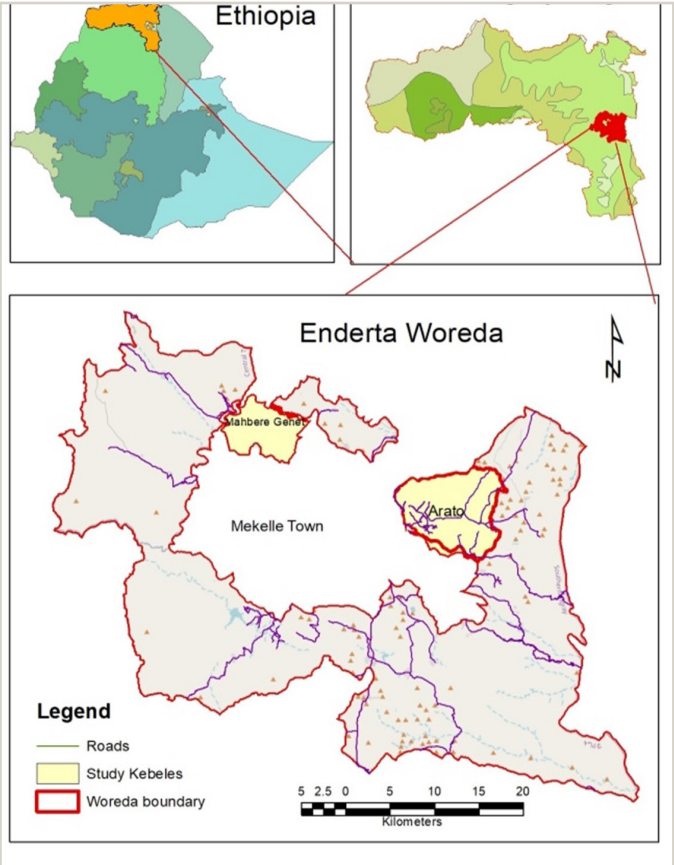


Figure 7: Map of Enderta woreda

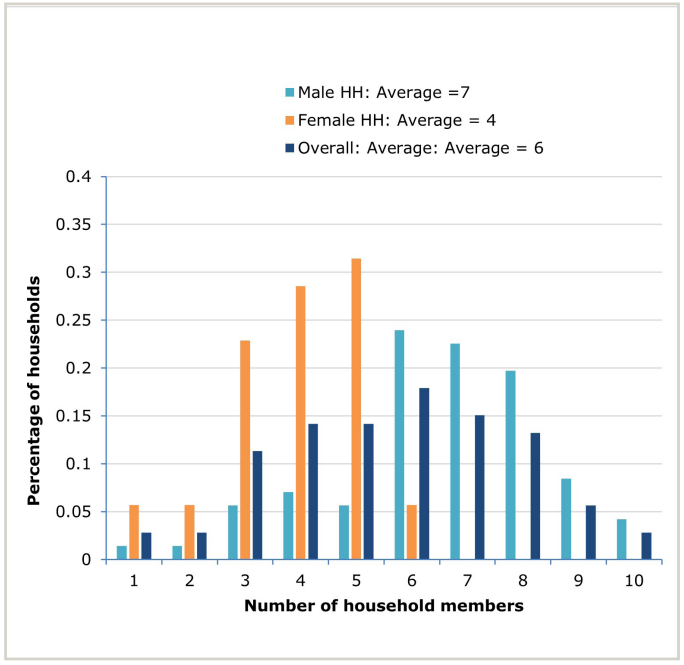


Figure 8: Family size of surveyed HHs

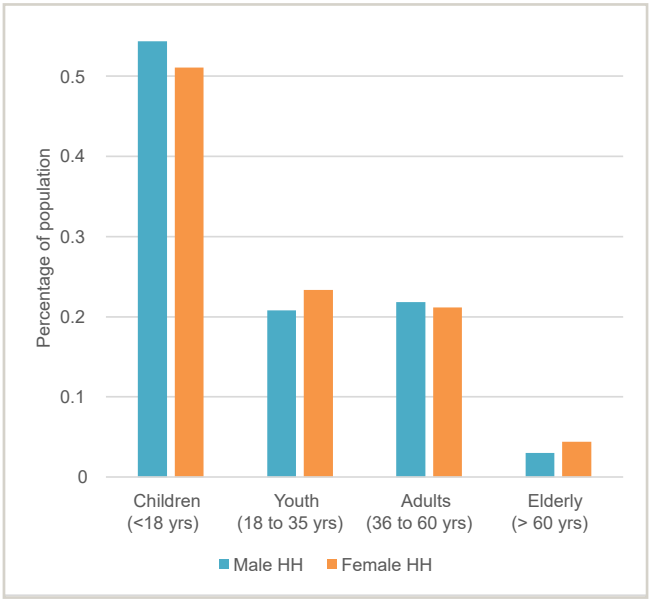


Figure 9: Age category of surveyed HHs

Table 3: Education level of surveyed HH head

Educational level	Male head %	Female head %	Total %
Doesn't read and write	45	65	51
Adult/religious education	10	0	7
Primary school	37	29	34
Secondary School	4	6	5
Diploma and above	4	0	3

Priority topics identified and validated by stakeholders

- Specialized technical and vocational training
- Adult education, especially for women

2 Agro-ecological and environmental conditions

According to secondary data from the Enderta economic development office of the *woreda* Annual Agriculture report 2023, Enderta *woreda* is 141,052.00 ha in size. The *woreda* comprises altitudes ranging between 1750 and 2780 meters above sea level (m.a.s.l.). It has three major agro-ecology zones: highland (38.5%), midland (39%) and lowland (22.5%) and the temperature ranges between 21-25°C. The average annual rainfall ranges from 450 to 650 mm and is distributed in a unimodal pattern between April till August. The topography of the *woreda* is varied and consists of flat land (43217.2 ha), mountain (41999.5 ha), valley (97 ha) and undulated lands (55,738.3 ha). The *woreda* has 31570 ha cultivable land and 3704 ha irrigated land that are suitable for different crops. The major soil types of the *woreda* are clay, sandy loam, and clay loam.

The major crops grown in the area are wheat, barley, teff, sorghum, and grass pea. The unpredictability of rainfall is increasing, with late commencement in July, early cessation in August, and unequal distributions which are affecting crop productivity. In favourable seasons, wheat, barley, and teff productivity averages 2200, 1900, and 1400 kilogram (kg) per hectare, respectively whereas during the bad season the productivity remains very low and even reaches to complete crop failure (Enderta *Woreda* office of Agriculture, 2019).

The *woreda* is located in a dryland environment which is increasingly affected by climate variability and change. Crop damage from frost and dessert locust invasion, and disease and pest are threatening crop production. The farming system is traditional in which oxen provide the draft power for land preparation. Food insecurity is a chronic challenge for HH in the drylands, and communities have been receiving food aid for decades.
The major problems related to environmental degradation are: land degradation which manifested in soil erosion, deforestation, expansion of invasive plants, poor soil fertilty, overgrazing of communally owned rangelands and farming of hillsides and marginal lands.

Due to the availability of ground water in Arato and Mahbere genet *kebele*s there is a potential for irrigation. Some households have access to irrigation water in areas located along the riversides. There is a lack in maintenance of the constructed water sources for tap water. In addition, there is a lack of irrigation infrastructure and water pumping technologies. The limited access to energy and power is among the factors inhibiting utilization of the irrigation water potential in both *kebele*s. In both *kebele*s, most women and youth do not have access to land and irrigation water. During focus group discussion community

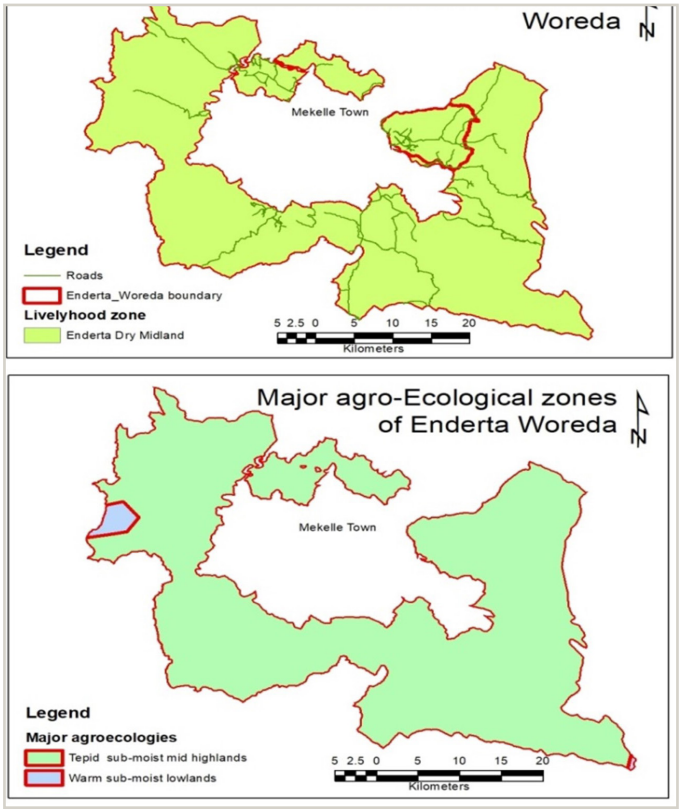


Figure 10: Livelihood zones and agro-ecological zones of the woreda

representatives mentioned an issue around the pollution of the water caused by a neighbouring cement factory and improper waste disposal of the city.

The identified and validated priority themes highlight the need of foreseeing the future impact of environmental deterioration and climate variability on the food system. A future-proof food system must be resilient, able to adjust to climate variability while also mitigating environmental degradation and soil fertility loss.

Priority topics identified and validated by stakeholders

- Enhance sustainable land management to prevent soil erosion, land degradation, and deforestation
- Enhance and manage soil fertility
- Promote climate smart production strategies to limit the damage of frost and hail and cope with rainfall variability and/or climate change
- Strengthening knowledge and skill on efficient and environmentally sustainable production technologies and techniques
- Application of Efficient waste management

3 Agricultural production system

Agricultural crop production followed by livestock rearing is the main source of livelihood in the *woreda*. As indicated in the community maps the main land use types of Mahbere genet and Arato *kebele* are cultivable land, irrigated land, grazing land, and forests. The *kebele*s have perennial rivers which have high potential for irrigation activities. The grazing communal lands are being increasingly diminishing and their land use is being changed to arable land in both *kebele*s due the expansion of irrigation activities.

The *woreda* has two major production seasons: rain fed and irrigated. The major, rain-fed, production season runs from June to September, with irrigation production taking place from October to May.

Commodities like wheat, barley, teff, chickpea and grass pea are the major crops produced in Arato. Commonly produced crops in Mahbere genet include wheat, barley, tef, sorghum and grass pea. cabbage, pepper (green), onion, tomato, garlic and maize (green) are commercially grown, under irrigation, in both *kebele*s. In addition, carrot and potato are also practiced as commercial crops in Arato *kebele*. Moreover, poultry and livestock production are commonly practiced in both *kebele*s.

As mentioned above, both *kebele*s have the capability and experience to produce crops with irrigation. The sources of irrigation water are river, well, and dam. As summarizes in Table 4, among the surveyed households, most farmers produce bread wheat (75%), teff (50%), sorghum (36%) and barley (25%) but the productivity is very low compared to national average of the crops. In relation to access to improved seed farmers' access to bread wheat seeds average (61%) with limited on teff seeds (19%). Farmers have no access to improved seed of sorghum and barley.

Farmers have experience in the use of fertilizers and pesticides on bread wheat and teff. The use of organic manure and compost is very limited (below 18%) in all crops.

The majority of the farming HHs (82.1%) engaged in the baseline survey have experience with crop rotation (Table 5). There is an observed continuous cereal-based crop rotation (for example, sorghum followed by wheat and vice versa) in Mahbre genet. However, it is a common practice to rotate wheat and barley crop with legumes (grass pea or chickpea) in Arato *kebele* even though it lacks regular pattern. Focus group discussion conducted with male respondents of the area indicated that there is a decline in the crop rotation practices and sometimes they do it as substitute for crop failure due to drought or excessive rainfall. This is because pulse crops such as grass peas and chickpeas can thrive with little rainfall at the end of the rainy season, making them suitable as alternative crops.

The other agronomic practices like intercropping and green manuring are almost non-existent in both *kebele*s. The baseline survey also showed that a small number of farming HH have experience with relay cropping and

Table 4: Inputs used for the three major crops[2]

Crop	% HH that cultivate specific crops %	Improved variety % HHs	Urea % HHs	NPS % HHs	Pesticide % HHs	Productivity QT/Ha	% Produce sold %
Maize	87	99	99	100	34	26	17
Teff	73	11	95	96	85	11	39
Barley	72	1	59	93	60	15	22

Table 5: Experience in agronomic practices

HH head	Intercropping %	Relay cropping %	Crop rotation %	Agro-forestry %	Green manuring %
Male	70	32	96	4	4
Female	52	36	92		4
Overall	66	33	95	3	4

[2] 10 Quintals = 1 metric tonne

agroforestry practice (Table 5). Focus group discussion revealed that it is common to plant maize in rows with different vegetables. This practice is considered to reduce impact of wind and protecting the vegetables from different diseases. Farming HHs are applying different soil-water conservation and soil fertility management practices such as terracing both on communal land and private farms. Except sorghum, there is an observed late planting time (July planting) of cereals even on the time of early rainfall (June) in both *kebele*s. This is not a recommended practice in the dry land environment.

Three years ago, both *kebele*s were among the high input (inorganic fertilizer, seeds and pesticides) demanding *kebele*s. This situation has been severely affected by multiple years of war and crises. Access to inputs has been disrupted in the last three years coupled with high price and untimed availability in the local markets. Farmers have remained farming using the manure and compost application options to minimize the inorganic fertilizer supply gap. The recent introduction of tractors for tillage activities showed the willingness of the farming communities to adopt new agricultural tools. However, during focus group discussion community members raised that the issue of fair price for the renting tractor services and proper handling of the tractors needs further consideration.

The *woreda* endowed with valuable natural resource (irrigation water and land) potential to strengthen and diversify its agricultural production and enhance the food and nutrition security of its war and drought affected people. Food system approaches are required to increase the availability and accessibility of agricultural technologies. as it is placed near to the regional market it requires input and output networking to reap the opportunities. This requires better extension strategies targeting the jobless youth and women and capacitating the farming communities.

The validated priority topics for agricultural production strongly correspond with the insights generated from the baseline survey and focus group discussions.

Priority topics identified and validated by stakeholders

- Promote sustainable agricultural practices such as Early planting, intercropping, Integrated Pest Management & Integrated Soil Fertility Management)
- Support timely and affordable agricultural inputs availability (Seeds, fertilizers and pesticides)
- Improved access to improved agricultural tools with fair renting price and timely availability
- Promote women and youth focused extension service
- Develop effective and sustainable seed multiplication and distribution system
- Demonstration and promotion of early maturing and market demanded crop varieties
- Create agricultural related job opportunities to land less women and youth

Mahbere genet kebele community wall source of irrigation water (top) and Arato kebele irrigation field (bottom) Photos taken by: Mizan Amare

4 Markets and value addition

Market information provision is important to make informed decisions, identifying best opportunities, manage risks and better planning. According to Shepherd (1997)[3], public provision of market information aims to reduce asymmetry of information and make informed decisions in the marketplace. According to the baseline data (Figure 11), the majority of farming HHs (69%) have access to market information from various sources. FHHs (62.9%) had less access to market information compared to MHHs (76%). This could be attributed to MHH's greater mobility and participation in various social events compared to FHHs.

Farmers obtained information primarily from family and friends (29%), traders (21%), peer farmers and neighbors (17%), and radio/TV (11%). Market information provision via radio and development agents (DAs) was described as very low (Figure 12). Based on focus group discussion, the low information provision through mobile phone and *kebele* DAs was explained to be affected by the lack of a

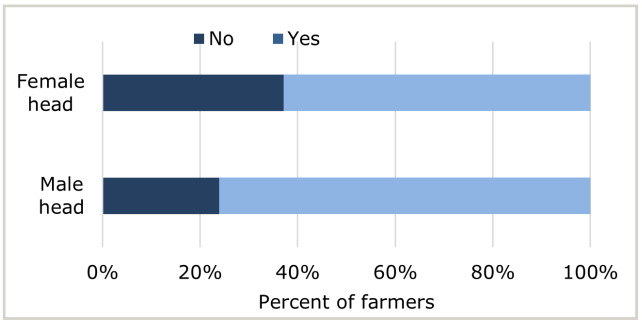


Figure 11: Proportion of households with access to market

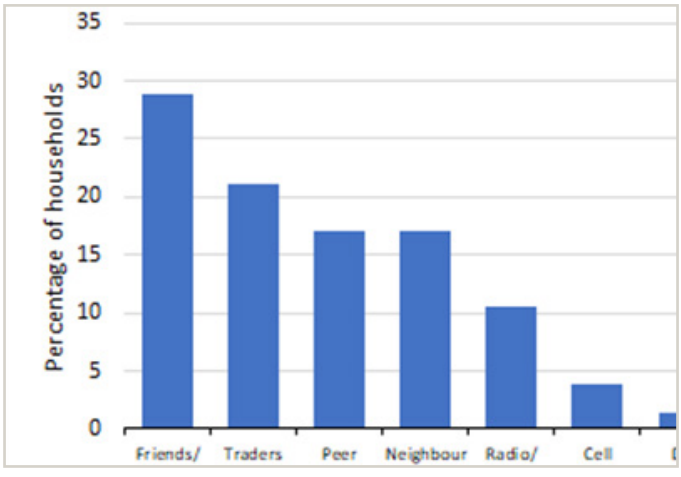


Figure 12: Source of market information

functioning mobile network and the displacement of large number of experts due to the war and subsequent siege that lasts for more than three years in the region.

The survey assessed the means used and the distance that households have to cover to reach the market to transport and sell their products. These are important considerations to optimize farming operations, reduce costs and improve overall competitiveness.

Households from Mahbere genet and Arato *kebele*s use different means to transport their goods to the market (Figure 13). Most farmers in Mahbere genet transport their goods to the market on foot (94%), with the remaining that use vehicle/bajaj (6%) as a means of transportation to market. This is probably due to the near

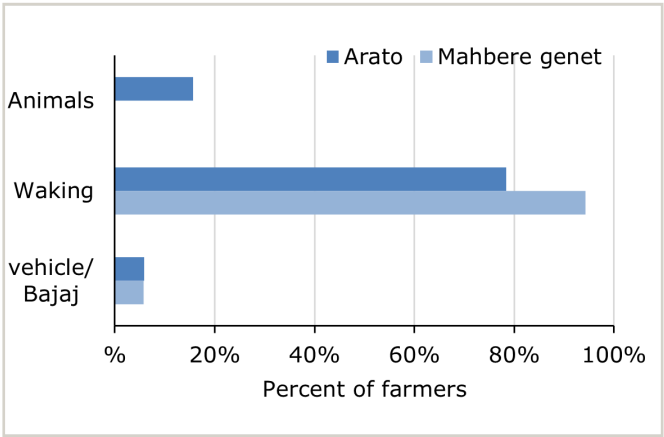


Figure 13: Means of transport to market

placement of the villages to *kebele* center and the regional city. Similarly, Arato farmers use walking (78%), animals (16%) and vehicle/bajaj (6%) for transporting their product to market. Using their usual means of transportation their product to market for surveyed households, the average trip time from the farm to the nearest usual market, takes about 60 minutes for farmers in Arato while it takes 25 minutes for households in Mahbere genet.

Results from the focus group discussion showed that there are limited local market places in both *kebele*s. Although the *kebele*s are close to the regional capital Mekelle, there is limited market connectivity and networking opportunities. The farmers in Mahbere genet have no regular marketplace in the *kebele*. Both *kebele*s have all-weather roads to Mekelle town; Mahbere genet is connected to Mekelle with asphalt road while the road from Arato to the nearest Mekelle sub city Quiha is an unpaved road.

Farmers who use major irrigation systems for agricultural production can sell their products wholesale on their farms. There is no plant in the vicinity to process

[3] Shepherd, A.W. (1997) *Market Information Services: Theory and Practice.* FAO, Rome.

agricultural products, like tomatoes to improve the post-harvest processing and value addition. During focus group discussion participants emphasized the challenges encountered with tomato selling prices, which drops from 150 birr per kg in some seasons to 5 birr per kg during peak tomato production seasons (January to April). As a result, prices fluctuate dramatically, frustrating farmers who produce vegetables.

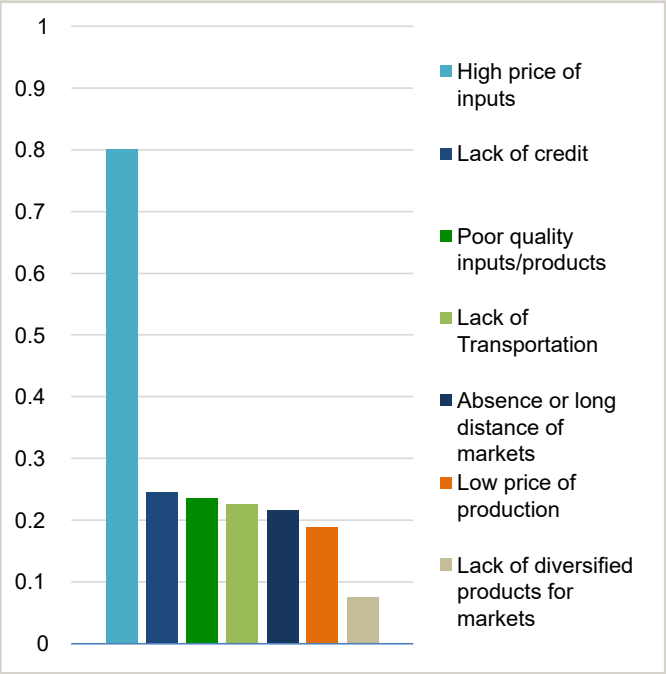


Figure 14: Challenges faced in marketing

Infrastructure-related issues such as a lack of an electrical system to power irrigation, irrigation structure maintenance, water scarcity, and a lack of a stable market place for farmers to sell their produce in Mekelle are among the primary issues that require attention in both *kebele*s. The long war crises have severely disrupted the service provisions that the *kebele*s needed to function properly.

High price of inputs in relation to marketing is the main challenges mentioned (80% farmers) in both *kebele*s followed by lack of credit to buy agricultural inputs and poor quality of products. Other challenges in relation to marketing include amongst others: lack of transportation, absence of appropriate market place, low price of production or price fluctuation (sometimes on vegetables) especially during harvesting and lack of diversified products for market (Figure 14).

Priority topics identified and validated by stakeholders

- support in establishing permanent local market place
- Demonstrating and promoting value addition and post-harvest handling technologies and techniques
- Convenient and easy way of market linkage and networking inclusive for women and youth
- capacity building on market and value addition opportunities

Vegetable market in Tigray region
Photo taken by: Mizan Amare

5 Credit and financial services

Agricultural credit and finance are key tools for farmers, as they help to bridge resource shortfalls and improve agricultural operations. Results from the baseline survey and focus group discussion indicate that there are micro-finance institutions (MFIs) and Rural Saving and Credit Cooperatives (RuSACCOs) in the *kebele*s. There is also one bank in Mahbere genet *kebele*. Nonetheless, provision of financial services was virtually absent during and after conflict. This was due to the financial losses that were suffered during the war and the limited financial availability after the peace agreement.

According to participants of the focus group discussion, even before the war there were issues affecting credit access. It had constraints like short credit time, low amount of credit, high interest rates, and collateral requirements. These conditions were specially affecting the youth to get loan because in addition to the above-mentioned challenges, it and requires lengthy bureaucratic procedures. According to the respondents, credit service provisions were limited for women, youth, and low-income households, even before the war started. On the other hand, resource-poor HHs are hesitant to take out loans because they are frightened of failing to repay them.

About 36% of HHs have access to credit from formal sources (non-governmental organizations, bank/financial institution, micro-finance including (Village saving and loan associations and rural savings and saving cooperative organizations) and 18% of HH access credit from informal sources (informal lender, friends or relatives (Figure 15). There are limited differences between MHHs (38%) and FHHs (31%) in their access to formal sources of credit. The baseline survey results indicated that MHHs have better access to formal loans, while FHHs have better access to informal lending sources.

The results of the focus group discussion revealed that informal lenders, in most circumstances, have a negative impact on the life of poor households by charging higher interest rates. They may even have taken their valuable assets as collateral to threaten and unfairly discharge them

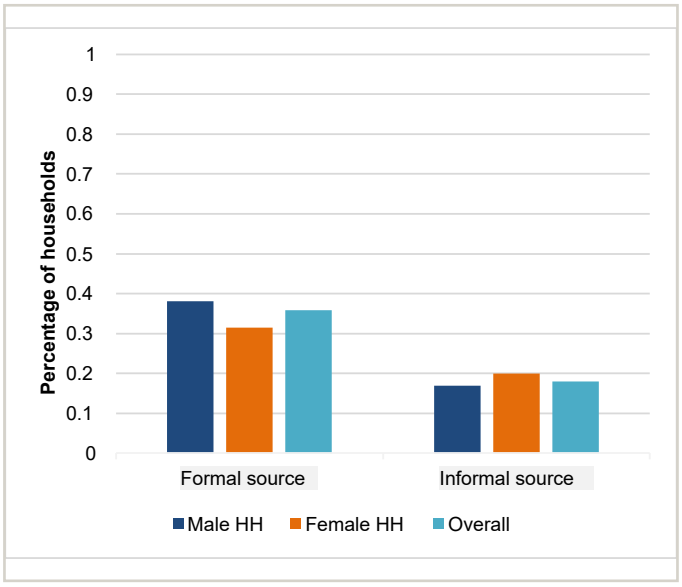


Figure 15: Access to credit

The issues that have been emphasized in this domain address these specific challenges. There is an urgent need to increase access to financial services and credit. Multidimensional credit provision is critical for the purchase of agricultural technologies, SME and entrepreneurial investments, and credit for women, youth, and low-income households. Furthermore, there is a tremendous need to build the capacity to implement novel financial provision alternatives for the unemployed and impoverished. This should encompass the specialized talents and competencies of rising entrepreneurs.

Priority topics identified and validated by stakeholders

- Reinforce and strengthen of the collapsed input delivery, extension service, credit and financial institutions, and primary cooperative institutions
- Pilot innovative SMEs business and financial provision models
- Improve local access to financial services and credit provision (especially for women and youth) with low interest rates and relaxed collateral
- capacitating in financial management, and business development, and entrepreneurial skills

6 Food and nutrition security

Enderta *woreda* is one of Tigray's food-insecure and drought-affected *woreda*'s, with many people suffering from hunger. Dietary diversity is quite low in both studied *kebele*s, and no gender disparities exist in terms of food and nutrition security. Approximately 91% and 90% of MHH and FHH are food insecure, respectively (Figure 16). According to the baseline survey, farmers do not have enough food from June to September, which is consistent with the RFSA debate. This clearly illustrates that farmers rely primarily on their own output for their sustenance.

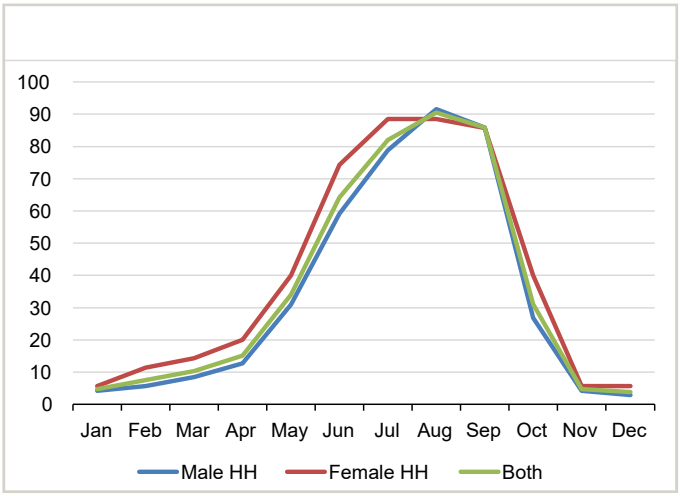


Figure 16: Percentage of HH having insufficient food in different months of the year

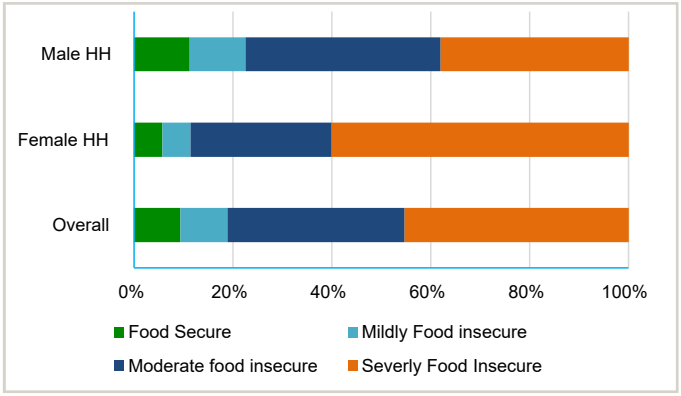


Figure 17: Percentage of HH classified in different stages of food security[4]

Both MHH and FHH households experienced food insecurity (Figure 17 and Figure 18). Food scarcity in Enderta is most severe during July and August. The survey result showed that the food scarcity period is from May to September but at the first September it reduces due to some vegetables like mustard grow and they feed their family and contribute for the Starvation.

[4] https://www.fantaproject.org/sites/default/files/resources/HFIAS_ENG_v3_Aug07.pdf

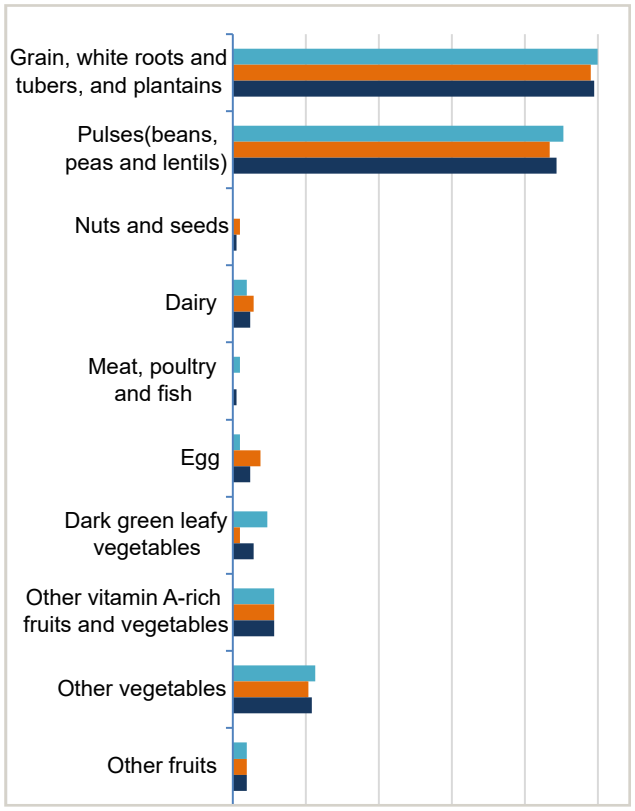


Figure 18: Percentage of HH consuming food group in

People in Enderta *Woreda* most depend on grain source of food (99%) followed by pulses (88.6%). The consumption of other food types like animal products, vegetables, fruits and others is very low. The least frequently consumed food groups were "nuts and seeds" and "meat, and poultry", which were consumed by less than 3% of both the male headed and female headed household participants. On average, only 2 different food groups are consumed and diets consist mainly of cereals and pulses, which is far below the recommended score of 5 food groups2. In all the people interviewed, none of the respondents consumed 5 or more food groups on the previous day. This makes the probability of micronutrient deficiencies in women and children that leads to undernutrition.

Based on the focus group discussion the main factors that determine people consumption were wealth/income, awareness, gender, and age exert significant influence. Among these, wealth and awareness are the foremost determinants that shape people food consumption. While cultural norms historically played a role in shaping dietary practices concerning gender and age, contemporary trends suggest diminishing disparities in this regard. Factors like availability of irrigated land, home garden and its harvests increase availability of food options in the market and household consumption.

According to understandings from focus group discussion, a healthy meal comprises foods that possess both quality nutritional content and appealing taste, while also offering a diverse range of options like retaining health status, maintaining ageing and the comfort it gives them after eating. They believe that the commodities for a healthy diet contain red teff, barley, vegetables and animal products like honey, dairy and meat.

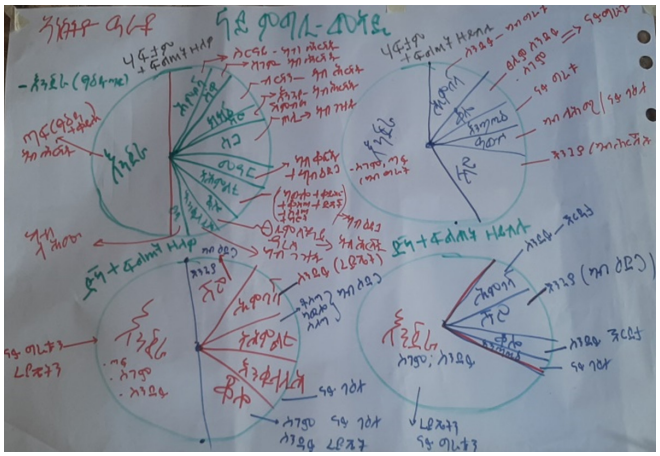
Women and men in the group need to increase their nutrition knowledge and skills through trainings, advice, and culinary displays. Male group participants in Mahbere genet and female group in Arato elaborate on how affluent households are unable to meet their dietary needs owing to a lack of awareness and information. There was also a lack of awareness and dedication to feeding pregnant women and children, as well as an insufficient supply of nutritional commodities options. During the discussion, it was also mentioned that because of the war and the region's recurring drought, the production and productivity of nutrition dense foods had decreased. Furthermore, at both *kebele* both sex groups shown a lack of knowledge about how to prepare nutritious and healthy meals.

Food taboos were found during the FGD with both male and female participants. During the group discussion, participants agreed that the primary causes for food taboos were cultural and health-related issues. Both focus group discussion participants indicate that young girls are not permitted to drink yoghurt or hot beverages such as tea, whereas boys are permitted to consume any type of food they encounter. Food is prioritized for the husband, next for the children, and finally for the mother. Though these foods can have an impact on women's nutrition, they are becoming less prevalent as the generation becomes more educated.

The priority topics that were identified in this domain related with improving the knowledge and creating awareness of the nutrition and healthy diets, increasing availability of nutritious dense commodities, demonstrating different recipes and intensifying home garden and work on food safety and simultaneously improve the infrastructure to enhance HHs' access to safe water.

Priority topics identified and validated by stakeholders

- Improving knowledge and awareness on the importance of a healthy diet
- Increase the availability and use of post-harvest storage that improve shelf life of products
- Improve availability of your round production and consumption mechanisms /home garden practice
- Irrigation water availability options and water saving and lifting technologies for year-round production
- Improve availability of nutrient dens foods (vitamin A, Iron & zinc rich product) such as orange fleshed sweet potato production
- Correct use of pesticides to improve food safety and health concerns
- Increased availability of safe water
- Increased dietary diversity and recipe demonstrations



Different plates indicating

- *Wealthier family with awareness,*
- *Wealthier with no awareness /knowledge,*
- *Poor family with awareness and*
- *Poor without awareness, Arato keblele, women focus group*

Demonstration of home garden food production and consumption at Mahbere Genet Kebele.
Phot taken by: Gitet Girmay

7 Inequalities based on gender identity and age

The analysis indicates that there are varying degrees of disempowerment among women, men, and youth. The youth and women in the Mahbere Genet and Arato *kebele*s experience higher levels of disempowerment compared to men across most domains (see Figure 19, Table 6). While each group demonstrates strengths in different areas, a common theme of disempowerment is noticeable in terms of access to and control over financial decisions. However, all groups—women, men, and youth—show significant empowerment in production decision of input, ownership of asset and control over use of income.

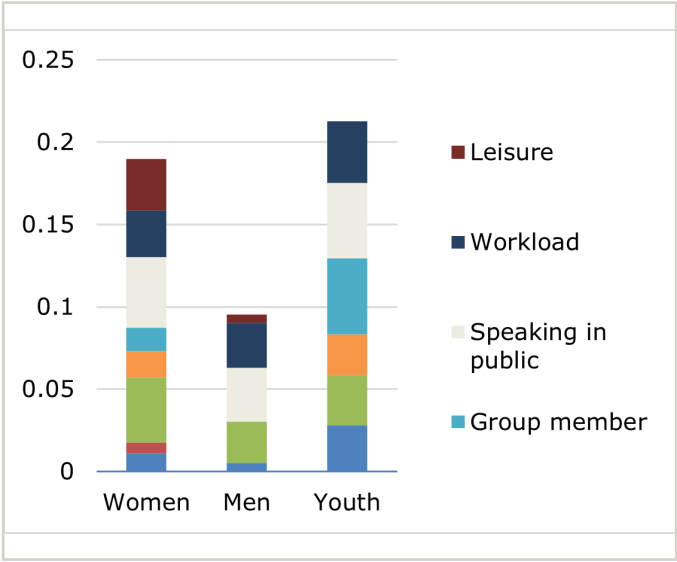


Figure 19: Women empowerment in agriculture (WEIA) score for women, men and youth in Yilmana Densa. Weighted score of the % of people classified as disempowered in specific domains

Women's disempowerment and ideal women

Women's disempowerment, as indicated by the graph (Figure 19), faces significant disempowerment in speaking in public, leisure, access and decision on credit. Women has the highest workload as compared to men and youth. This low participation in such key areas highlights underlying barriers to economic empowerment and financial independence of women.

Women experience the highest level of disempowerment in access to and decision-making regarding credit, at 64.3%. This is followed by public speaking, with a disempowerment rate of 54.8%, and workload, which stands at 64.3%. Disempowerment in leisure activities is measured at 31%. Other areas, such as ownership of assets, group membership, control over income, and production decisions, show disempowerment rates ranging from 4.8% to 14.3% (see Table 6). Conversely, women tend to be relatively better empowered in the areas of input production decisions, control over the use of income, and ownership of assets.

Focus group discussions revealed that women have limited access to financial services and women-focused extension programs. In Arato, women are paid lower wages than men. Among the characteristics considered ideal for women are being silent, honest, and respectful towards their husbands and others. These social norms contribute to the disparities in empowerment between men and women, particularly in areas such as leisure time, group membership, and public speaking. Women generally have a heavier workload than men, especially during peak agricultural seasons (June–August and October–December), when they engage in daytime agricultural tasks like planting, weeding, and harvesting. Additionally, women carry out all their household responsibilities during the remaining daytime hours and into the night. In discussions about ideal women, young people highlighted the burdens faced by women, both young and old, including cooking, child care, water fetching, house cleaning, and other non-economic activities

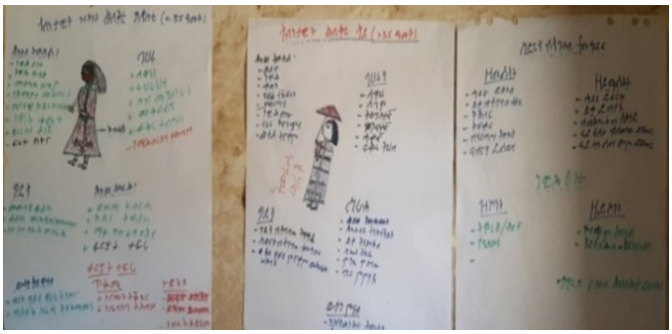


Figure 20: Drawings of ideal women as described by the participants of the FGD. Mentioned characteristics: Humble, good cook, good advisor to husband, well dressed, peacefully with neighbour, silent, calm,honest, patient, religious, good communicator to husband

Men disempowerment and ideal men

Men experience notable disempowerment in three domains: access to and decision-making regarding credit, workload, and public speaking. Their relatively low scores in accessing credit indicate that they have limited influence over economic resources and financial decisions.

The most significant area of disempowerment for men is access to and decisions about credit, where the disempowerment rate is 65%. This is followed by public speaking at 35% and workload at 37.5%. Disempowerment in leisure is much lower at 5%, while other areas such as control over income, group membership, and production decisions show minimal or no disempowerment (see Table 6).

Focus group discussions indicated that men encounter challenges similar to those of women in accessing financial resources. Their workload during certain seasons—such as plowing, planting, harvesting, and threshing—was identified as a significant factor contributing to their disempowerment.

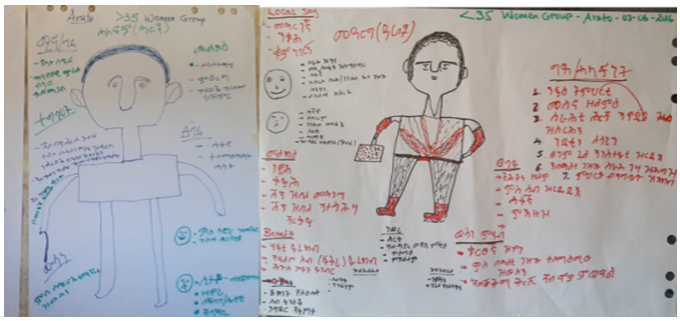


Figure 21: Drawing of ideal men as described by participants of the FGD. Mentioned characteristics: honest, innovator, sociable, free from alcohol addiction, mediator, collaborative, respect his wife, well dressed, not extravagant, religious, hard worker

Table 6: Percentage of women, men and youth classified as disempowered in different domains using the WEIA cut-off values[5]

Respondent	Input in production decisions %	Ownership of assets %	Access to and decisions on credit %	Control over use of income %	Group member %	Speaking in public %	Workload %	Leisure %
Women	2.7	10.8	75.7	2.7	21.6	54.1	45.9	27.0
Men	2.4	4.8	69.0	2.4	2.4	33.3	38.1	31.0
Youth	21.7	21.7	95.7	26.1	47.8	21.7	26.1	26.1
All respondent	6.9	10.8	77.5	7.8	19.6	38.2	38.2	28.4

Youth disempowerment

Youth (between 18 years and 35 years age) experience significant disempowerment in several key areas, particularly in terms of access to and decision-making regarding credit, opportunities for group membership, and public speaking. They also face challenges in influencing production decisions and controlling their income compared to both men and women. This indicates a struggle in balancing responsibilities while striving for financial independence and social connections.

Specifically, disempowerment among young people is most pronounced in group membership, at 54.2%, followed by access to and decisions concerning credit at 50%, and public speaking at 45.8%. Workload disempowerment is at 41.7%, while control over income is lower, at 12.5%. However, youth do not experience disempowerment in the areas of asset ownership and leisure activities (Table 6).

From the focus group discussions, it was noted that young people have limited access to collateral and land resources, which affects their control over income and input in production decisions. Additionally, young males tend to have more leisure time compared to young females. Despite the challenges, young people appear to be relatively empowered in having opportunities to participate in generating income through activities related to the extraction of sand and stones used as construction materials in the nearby city of Mekelle.

Focus group discussions identified key issues for social and economic inclusion, emphasizing reducing women's workloads and creating youth job opportunities. Challenges include limited employment access, lack of tailored support, inadequate resources, and minimal participation in groups, leadership roles, and training. Addressing these requires integrated strategies to fully include women and youth in the food system.

Priority topics identified and validated by stakeholders

- Raising awareness about gender equality, equity, and social inclusion.
- Reducing women's workload.
- Customizing extension service to meet the requirements of women and youth.
- Expanding access to financial services and credit.
- Equal pay for female laborers
- Increased job options, particularly for youth
- Increased decision-making power over home resources

[5] https://www.ifpri.org/project/weai

8 Food systems resilience

Food systems are subject to a variety of interrelated shocks and stressors (Hamilton et al, 2020; Fan et al, 2021). Both can have a significant impact on critical food system outcomes such as the availability of sufficient amounts of high-quality food at reasonable costs, meaningful livelihoods, and environmental sustainability (Savary et al, 2020).

Enderta *woreda* features primarily dry land and a warm climate that is influenced by the eastern Ethiopian escarpment. It has a border with Afar. Extreme climatic changes, such as drought, pests, and variable rainfall, are becoming more prevalent, necessitating the development of coping and management measures to increase the population's resilience to these natural hazards. Furthermore, wars at various times have damaged natural resources, particularly forests and domestic and wild animals. The combination of these variables has resulted in ongoing food insecurity in the *woreda*, as well as vulnerability to shocks and disasters.

Similar observations were voiced in focus group discussion, where respondents mentioned that the war, COVID-19 outbreak, locusts' infestations, and re-occurring drought as being the most common shocks that affected their FS and resilience. Drought was the major shock affecting the farming community in 2023. The men's and women's groups noticed and critically raised the issue of air pollution in their vicinity caused by the nearby cement factory. They reported a decrease in agricultural production and harvest, lower straw palatability by animals, and an increase in malformed newly born infant babies in the area, when compared to the past. .

Some crop fields have failed to grow crops after planting due to the 2023 drought (complete failure)

In both *kebele*s and most focus groups discussion, war, drought, inflation, locust invasion, air pollution and joblessness were the highest ranked shocks and stressors affecting respondents' livelihoods. The impact of these shocks and stressors were manifested in loss of life, human displacement and/or migration, hunger, production loss, market failure, diseases and pests infestations, and low purchasing power due to lack of money and other assets. The war and the subsequent siege, in particular, has resulted in death (both human and animal), system collapse, deforestation, property looting, famine, intentional GBV (rape), a scarcity of medicines, and the escalation of disease for humans, livestock and crops. The FGD participants were also concerned that these shocks and stressors would result in continued loss of life, migration, instability, loss of output, starvation, disease, injustice, altered working conditions, divorce, and economic crises. The shocks and stresses have caused many vulnerabilities in the productive and environmental conditions, as well as the market, financial, human, and institutional contexts, as evidenced by decreased agricultural and livestock production, land degradation, inflation, and a sense of insecurity and injustice.

The participants in the FGD mentioned that they use various strategies to prepare for unexpected shocks and stressors. These strategies include saving money and seeds, harvesting soil and water, and reducing unnecessary spending on things like celebrations and memorials. Additionally, households use different ways to cope with challenges, such as cutting down on daily meals, relying on self-help, selling assets, and taking on off-farm jobs such as daily wages in towns.

The major issues for food system resilience, according to the focus group talks, include the introduction of climate smart technology and practices, showcasing soil fertility enhancement possibilities, improving soil and water conservation practices, IPM, international cooperation for the locust invasion and investigating the impact of cement factory health issues.

Priority topics identified and validated by stakeholders

- Demonstrating climate smart technologies and practices
- Identifying the impact of mesebo cement factory on production, health and environment
- Strengthen infrastructures (Electricity, and road)
- Establishment of Agricultural mechanization service providers
- Supporting/Aid food and agricultural material aid for poor farmers(Vulnerable societies)
- Exploring options of off farm job opportunities for youth and women
- Capacitating on efficient and environmentally sustainable production technologies and techniques for farmers and stakeholders

9 Policies and government support

The baseline survey and focus group discussion have revealed the importance of designing policies that are customised to support vulnerable population groups and vulnerable people within HHs (women and youth).

The thematic policy areas for Enderta are:

- Emergency response and resumption of development intervention
- Social and economic inclusion for local economic development,
- Enhanced extension and advisory services,
- Diversified and nutritious food systems,
- Promoting local food environments and healthy consumer behaviour,
- Climate smart and resilient agricultural practices,
- Partnerships for integrated food system policies, planning and governance
- Policies related to waste management vs health issues

Emergency response and resumption of development intervention

The war has had a significant impact on Tigray agriculture, causing farmers to lose their seeds, stored grain, livestock breeds, animal feed, and farm tools (both traditional and modern). Trees in re-forested areas and enclosures were also used as fuel wood and bunkers by armies. Quick action in the areas of capacity building, seed provision, fertilizer access, and farm implement distribution to farmers, for example, will have a big influence on food systems. As a post-war management strategy, this needs the synergetic involvement of both government and non-government initiatives.

Social and economic inclusion for local economic development

This thematic area encompasses enabling programs focussing on the extension system, market system, the input supply system and mechanisms to provide enhanced access to credit and finance support for small and medium enterprise development. Customized support programs geared towards creating opportunities for women and youth to engage in value chain activities or local economic development activities, have a strong potential to dynamize agro-economic development.

Enhanced extension and advisory services

Ethiopia's Digital Agriculture Extension and Advisory Services Roadmap 2030 and the extension strategy refer to the strengthening of pluralistic extension system which would enable private sector stakeholders to start operating as service providers at *woreda* and *kebele* level. Experience derived from the cooperative sector and other innovative structures, and experiences from initiatives to distribute and disseminate agricultural services and inputs (e.g. one stop shopping) need to inform future policies and investments within this domain.

Extension and advisory services need to extend beyond traditional function of distribution of agricultural inputs and dissemination of recommendations for production. Policies, mechanisms and instruments are required to create structural support for local (agro-) entrepreneurship. This encompasses support in areas such as, capacity strengthening in rural entrepreneurship, providing access to market **i**nformation, provision of financial support and seed capital for development of the agri-food sector and supporting the creation of non-agricultural jobs in the food system.

Diversified and nutritious food systems

Policies and programs that promote diversified production systems by integrating nutrition dense horticultural crops and pulses can enhance resilience of the food system and the nutrition security of *woreda* HHs.

Supporting producers to enhance their access to the market and market information can contribute to improved incomes, improved availability, accessibility and affordability of nutrition dense food products in the local market.

Promoting local food environments and healthy consumer behaviour

Policies addressing food and nutrition security can support the development of the local food environment. This can be through the development of domestic and local value chains, but also in the sense of strengthening the local market systems where producers, traders and consumers can sell and purchase diverse and fresh food items. Support for development of the agri-food system will require additional efforts on post-harvest services and value addition. Nutritious food systems require alignment and integration of production related policies with polices aimed and promoting healthy consumption behaviours.

Communication campaigns and behavioural change programmes, geared towards the promotion of healthy dietary behaviour and consumption habits should be part of the strategies and support provided by the *woreda* administration. Collaboration between different stakeholders working on production and working on nutrition and health is required to bring about impact.

Climate smart agricultural practices and resilient production systems

Climate variability and environmental degradation are

increasingly affecting agricultural production, food and nutrition security and population dynamics in the *woreda*. A diversity of national and regional initiatives has been deployed to prepare the agricultural sector for climate readiness. Successfully initiatives that have been tested and validated at *woreda* level, with the support of research and development partners, can be scaled and disseminated to reach more farming HHs in other *kebele*s of the *woreda*.

There are ample evidence and proven positive impact of climate smart, regenerative agricultural practices including amongst others, crop diversification, diversification of crop genetic resources with stress resilient crop cultivars, water management and conservation practices, and integrated soil fertility management practices. There is a need to expand on programs and policies promoting the dissemination and uptake of these types of agricultural and food system innovations.

The high pressures being exerted on the volatile agri-input market have caused skyrocketing fertilizer prices. The high costs of fertilizer can be relieved though promotion of soil fertility management measures that consider the integrated use of, locally produced, organic fertilizers and mixed cropping in combination with – imported - mineral fertilizers.

Partnerships for integrated food system policies, planning and governance

Addressing complex food system requires collaborative partnerships between stakeholders from different disciplines, sectors and jurisdictions of government. There is a need to develop strategies and plans that account for local complexity and diversity in the food systems and take into consideration locally identified priorities for action.

Using a food system approach, stakeholders can consider investments that contribute to socio-economic inclusion and wellbeing, food and nutrition security and ecosystem health.

Policies related to waste management and environmental rehabilitation

The waste generated by Mekelle town and nearby industries, such as the cement factory, has caused significant harm to crop and livestock production, as well as to human health and the environment—resulting in soil and water pollution. Addressing the challenges posed by this waste requires collaborative partnerships among stakeholders from various sectors, disciplines, and levels of government.

It is essential to develop strategies and plans that effectively manage the health and production hazards associated with waste in food systems, taking into account the priorities identified by the local community. By adopting a food systems approach, stakeholders can explore investments that promote socio-economic inclusion, enhance well-being, improve food and nutrition security, and support ecosystem health.

Overview of projects implemented in Enderta

The *woreda* administration in collaboration with diverse partners, have deployed and implemented different national policies and support programs at a local level. Policies and programmes have worked on supporting agricultural development, nutrition and health, regenerative agricultural practices, soil and water conservation, watershed management and agroforestry.

Some noteworthy projects, programmes and interventions that have been implemented at the level of the *woreda* are:

- Participatory Small-scale Irrigation Development Programme (PASIDP) under IFAD project
- World vision Ethiopia
- GIZ on Integrated soil fertility management
- SNV-Horti-life
- Mekane Eyesus

Enderta Woreda baseline study validation workshop participants

Opportunities and challenges for Enderta *Woreda* in a food system perspective

An overview of the most important opportunities and challenges, as identified through the RFSA and baseline surveys and validated by the stakeholders, are presented in figure 22. The challenges are formulated into goals, specific activities and interventions and placed into a food systems framework.

This overview illustrates how the identified opportunities and challenges are scattered throughout the different areas of the food system framework. In addition, it portrays how opportunities interlink and mutually contribute in specific ways to specific food system outcome areas.

Understanding and managing trade-offs and synergies in the food system

Food systems are by nature complex and dynamic and are characterised by interconnected, non-linear relations between the system elements and outcomes. When looking at any food system, one must be explicit and intentional to understand how certain activities affect different food systems outcomes, both positively and negatively.

An analysis of potential synergies and trade-offs is essential in understanding how food system outcomes at times compete and conflict with each other. For example, activities focussing on the production and productivity of staple crops have the potential to generate positive benefits in terms of yield increases with synergies that translate to the generation of income for farming HHs and contributions to improve food security at national level.

Nevertheless, these activities might also generate negative trade-offs such as the pollution soil and water due to excessive use of fertilizers and pesticides. In addition, a focus on staple crops might negatively deteriorate HH nutrition security and HH dietary diversity when farming HHs do not utilize the increased income to purchase healthy and nutrient dense food products. Another example of system behaviour is how activities to promote home gardens can improve the production of nutrient dense crops with potential synergies to enhance HH dietary diversity and to create a series of alternative livelihood and employment opportunities for women and youth in sector related support activities such as transport, value addition, distribution etc.

A system analysis reveals that the promotion of home gardens can also potentially generate trade-offs that have a negative impact on producers, consumers and the environment. For example, home gardening has the potential to increase the labour burden for women in the HH. In addition, the excessive use of fertilizers and pesticides in home gardening activities has the potential to negatively affect the health of producers and consumers but also has a negative impact on the environment.

When designing any type of food system interventions, one must be explicit and intentional to try to understand and manage how specific interventions can affect different food system outcomes. Understanding how trade-offs and synergies affect the food system and being explicit about how certain interventions can create trade-offs and synergies can support the design of bundled intervention packages, that actively pursue integrated approaches, designed to address multiple systemic food system issues.

Food recipe demonstration and nutrition behavioural change communication at Mahbere genet kebele, Enderta wordea

Photo taken by: Hadush Hagos

Contributors multi-disciplinary teams:
Hadush Hagos (Tigray Agricultural Research Institute), Mizan Amare (SWR/RAISE-FS project Mekelle liaison office), Tesfay Asgedom (Tigray Agricultural Research Institute) Adey Gebre (Tigray Agricultural Research Institute) Gebremedhin Abrha (Mekelle Universitry), Fisseha Hadgu (Tigray Agricultural Research Institute) Tiegsti Hadush (Mekelle University), Gebrekiros Maru (Tigray Agricultural Research Institute) Gebreyouhanis Girmay (Mekelle University)

Contributors *woreda*: Getachew Gebreegziabher, Almaz Weldu, (Agriculture office), Hailekiros Berhe (Cooperative office) Daniel Gebregziabher (Job creation office), Bri Hadgu (Women and youth office) and Gebremedhin Tekle (Trade office)

Contributors RAISE-FS: Akalu Teshome, Mizan Amare, Legesse Abate, Herman Snel, Julia Glaser Mirjam Schaap and Andualem Tadesse

Publication ID: SWRE-RAISE-FS-25-043

List of abbreviations

DA	Development Agent
FGD	Focus Group Discussion
FHH	Female Headed Households
GBV	Gender Based Violence
GIZ	German Agency for International Development Cooperation
HH	Household
M.A.S.L.	Meters Above Sea Level
MHH	Male Headed Households
MFI	Micro-finance Institutions
RFSA	Rapid Food System Appraisal
RuSACCOs	Rural Saving and Credit Cooperatives
WEIA	Women Empowerment in Agriculture
Qt	Quintals (10 Quintals = 1 metric ton)

References

Herman S., Julia G., Akalu T, Anteneh M., Tewodros T., Getenesh A., Haregewoin Y., Ted Schrader, Mirjam S., Katherine P., Thies R. Facilitator guide for rapid food system appraisal in RAISE-FS : manual on rapid food system appraisal. https://doi.org/10.18174/590873

Fan S, Cho EE, Meng T, Rue C. 2021. How to prevent and cope with coincidence of risks to the global food system. Annu. Rev. Environ. Resour. 46:601–23

Savary S, Akter S, Almekinders C, Harris J, Korsten L et al. 2020. Mapping disruption and resilience mechanisms in food systems. Food Secur. 12:695–717

Hamilton H, Henry R, Rounsevell M, Moran D, Cossar F et al. 2020. Exploring global food system shocks, scenarios and outcomes. Futures 123:102601

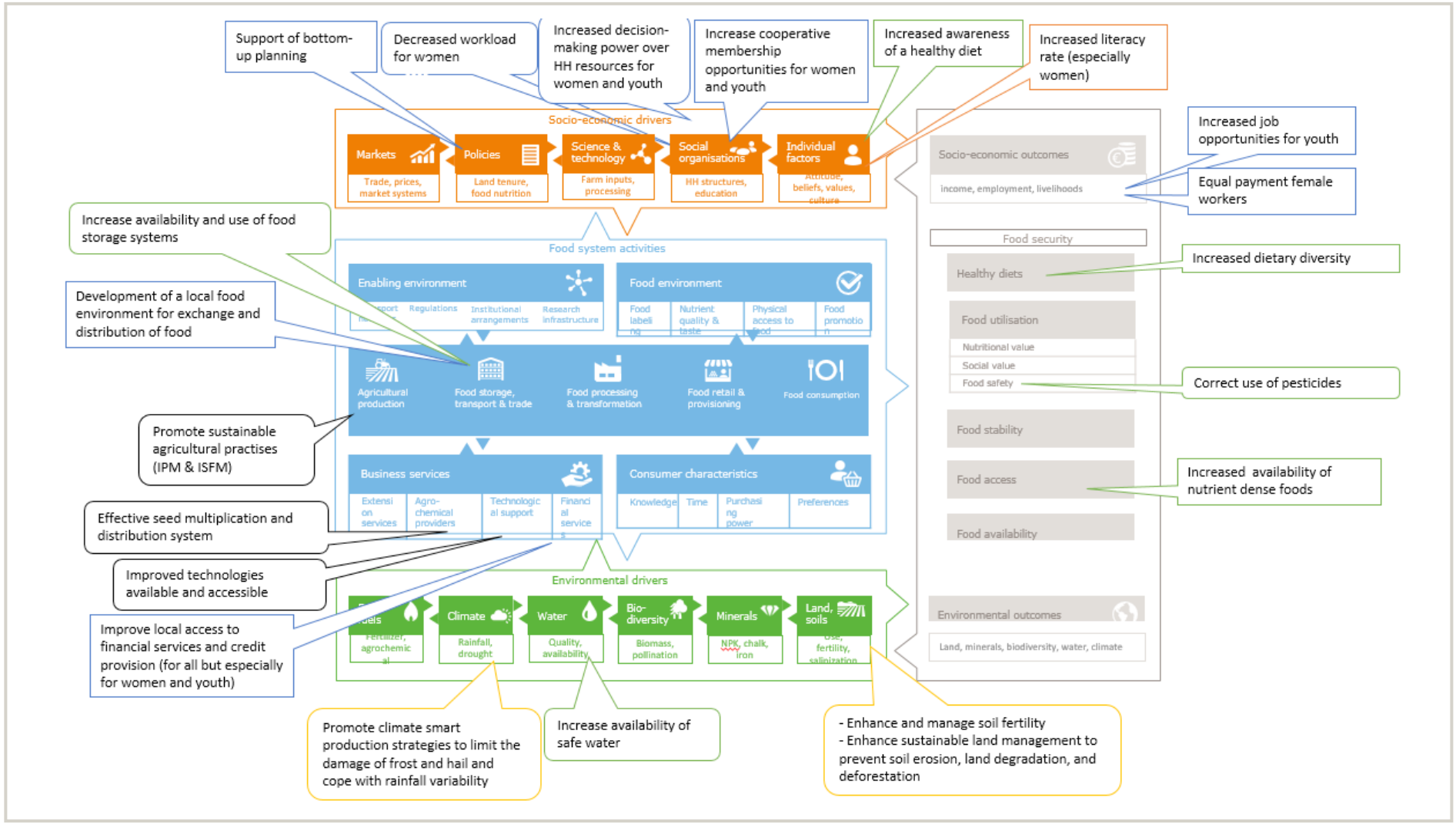


Figure 22: Identified priority topics in a food systems perspective (following by Berkum et al., 2018)

For more information, please **contact** either:

Dr. Dawit Alemu
Stichting Wageningen Research - Ethiopia
dawit.alemu@wur.nl

Dr. Irene Koomen
Wageningen Social and Economic Research
irene.koomen@wur.nl

www.raise-fs.org