RAISE-FS *woreda* profile #012

Raya Azebo *woreda* Food Systems Profile

Population

151, 912

74,925 | 76,987

Altitude

1,000 - 1,660 m.a.s.l.

Diets

Predominantly grains and pulses

Food insecurity

23% **FHH**

11% **MHH**

Food gap months

Jan ····· Dec

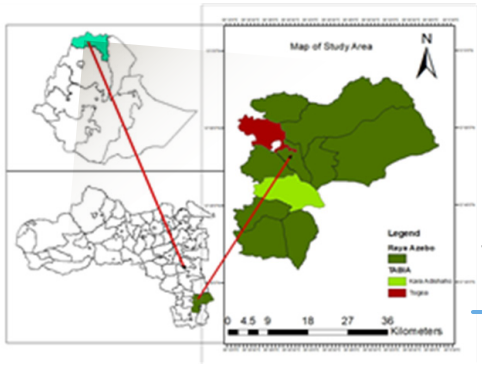
June–Sepember

Kara

Jan ····· Dec

April and September

Tsegea



Climate and soils

Soil fertility

Soil erosion

Deforestation

Land degradation

Raya Azebo *woreda*

Top 4 crops produced

sorghum teff chickpea maize

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

This document is called the *woreda* profile, which gives an overview of the current status, dynamics, and behavior of the local food system present in Raya-azebo *woreda*. The *woreda* profile was developed to support stakeholders' exercising evidence-based, bottom-up planning based on the existing reality of the *woreda*. 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 endeavors to provide information and data on demography, agro-ecological conditions, production factors, markets and value addition, food and nutrition security, social inclusion, resilience assessment as well as policies and government support.

This *woreda* profile is generated based on insights obtained from the baseline survey and rapid food system appraisal (RFSA) that took place in two *kebele*'s of Raya-azebo *woreda*. The two selected *kebele*s are low land areas which represent the different agro-ecologies of the *woreda*. *Woreda* administration officials who participate in *woreda* level workshop acknowledge 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 RAISE-FS project. Raya-azebo *woreda* is one of the selected implementation areas, in which quantitative baseline survey and a qualitative RFSA were conducted in parallel with secondary data, these are the main inputs for this *woreda* profile. Data collection was conducted in two of the *woreda*'s *kebele*s, Tsgea and Kara adi-shabo. These *kebele*s were purposefully chosen because of their potential for the project commodities (sorghum and chickpea). 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 104 respondents of which 39% were men, 37% women and 24% youth (of which 48% men and 52% 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, different plate's activity, and resilience assessment that validated in *woreda* and regional workshops[1].

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

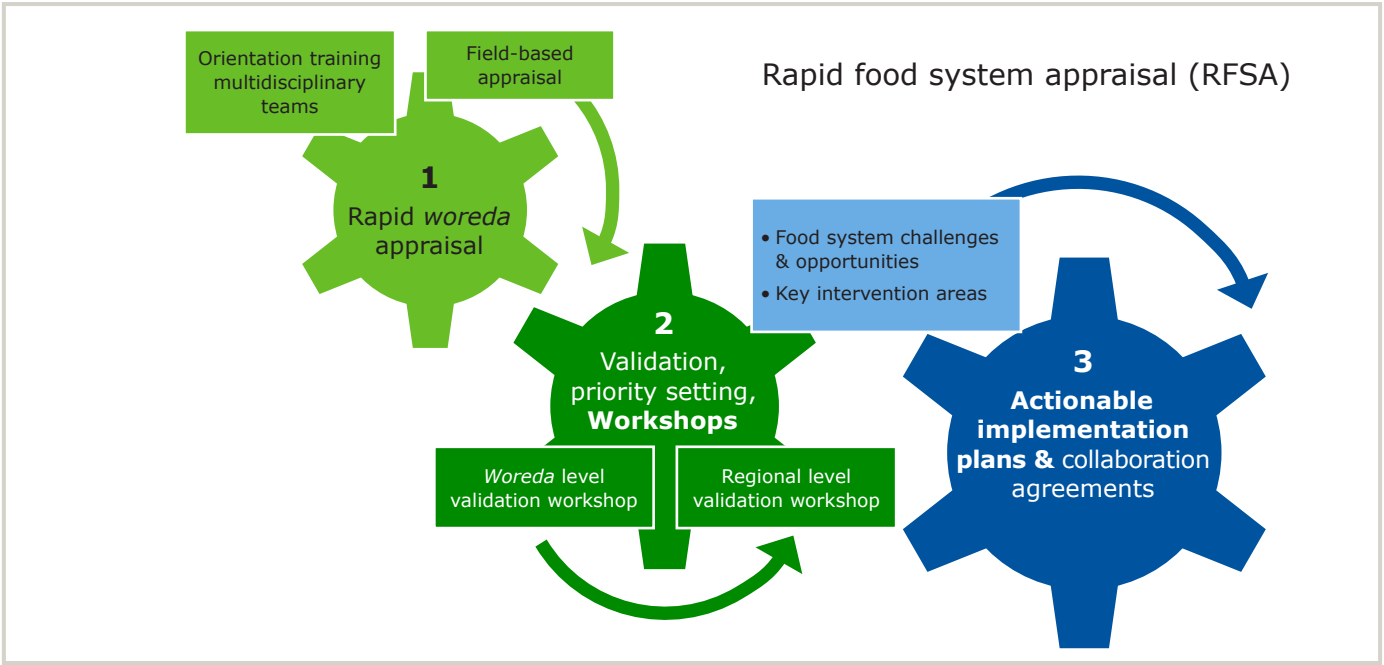
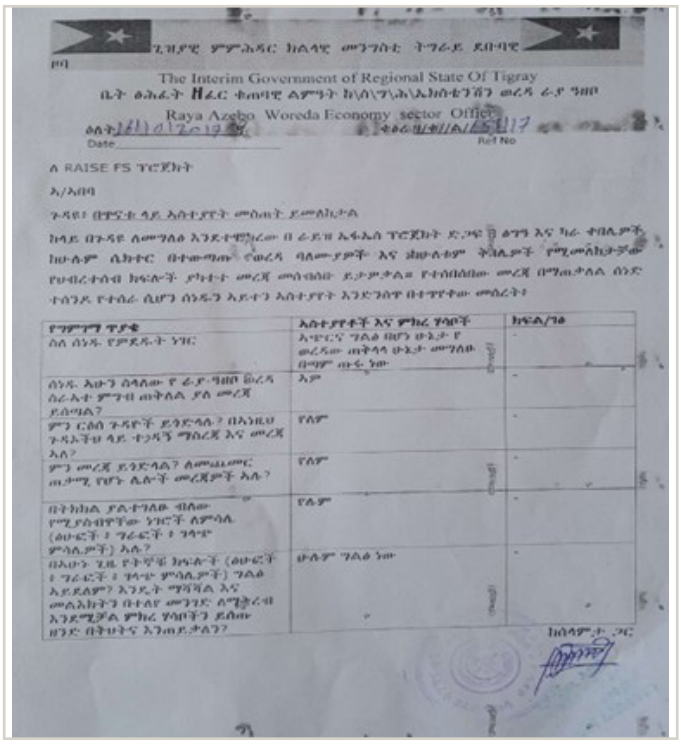


Figure 1: Steps of the rapid food system appraisal (RFSA) process

The activities were undertaken with female, male and stakeholder groups separately. The female group consisted of 12 persons (5 youth, 4 middle-aged and 3 elderly). Similarly, the male group was composed of 12 persons (5 youth, 4 middle-aged and 3 elderly). The institutional stakeholder group comprised development agents (DAs), head of agricultural offices, health extensions, cooperative managers, microfinance managers, land administration experts from *kebele* level, office of agriculture experts (extension, nutrition, natural resources and agronomy), cooperative promotion office, women, children and social affairs, trade and development office, microfinance and job creation.

The validation workshop was conducted with the *woreda* administrator, researchers of Alamata research Centre and head of different offices of the *woreda* (agriculture, cooperative, women, children and social 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 were taken into consideration and added in this document.



The Interim Government of Regional State Of Tigray

Raya Azebo Woreda Economy sector Office

Date

Ref No

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Summary of the content of the letter

From: Raya Azebo *Woreda* Economic Development Office

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

Subject: Feedback on *Woreda* Profile Document

As it is known, the RAISE-FS project undertook Rapid Food System Appraisal (RFSA) in two *Kebele*s of Raya Azebo *Woreda* (Tsgea and Kara Adishabo *Kebele*s) in collaboration with experts of different sectors of the *Woreda* and *Kebele* level stakeholders.

We reviewed the document and found that it fully provides a summarized overview of 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 Yilmana Densa Woreda Agricultural Development Office

Community mapping

Figure 3: RFSA participants drawing different templates

Figure 4: Community map of kara kebele by man group

Seasonal calendar

Table 1: Seasonal calendar from Dabal Kebele from female focus group

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

Table 2: Seasonal calendar from Dabal Kebele 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	×	×	×	×							×	×
2	Income spread over the year			×	×						×		
3	Seasonal labour activities												
4	Workload in different seasons		×	×	×								
5	The rainy seasons						×	×				×	×
6	Moments of critical drought	×											
7	Key cropping season for different crops									×		×	
8	High/low market price months											×	×
9	Busiest months of the year for women			×	×								
10	Busiest months of the year for men		×	×					×	×	×	×	
11	Pest and disease prevailing months		×	×					×	×	×	×	
12	Prevailing livestock activities	×										×	
13	Local market demands for local products												
14	Periods of food scarce	×											

1 Demography

Raya-azebo *woreda* located in the southern zone of the Tigray region. The main town of the *woreda* is Mekoni, which is 120 km far from the region's capital, Mekelle. Data from the *woreda* bureau of agriculture shows that the population size of Raya-azebo *woreda* is 151, 912 (of which 76987 men and 74925 women).

Results from the survey shows that the median household (HH) size consists of five people in the two studied *kebele*s. MHH have a size of six people, on average, while the median FHH have a slightly smaller size of five people (Figure 6). As illustrated in Figure 8, about 53% of the population is constituted by children (<18 years) and about 22% are youths (18 years to 35 years). Adults (36 years to 60 years) account for 20.9% of MHHs while 18.2% for FHHs. Elders (aged above 60 years) are less than 5% of the total population. The educational level of the heads of the HH was assessed in the survey (Table 3). About 86% and 59% of female and male heads of household respectively are unable to read and write. Of the MHH who are able to read and write, 8% received adult and religious education but none of FHH surveyed had this opportunity. 27% of MHH and 10% FHH completed primary school, and about 3% of MHH and FHH completed secondary school.

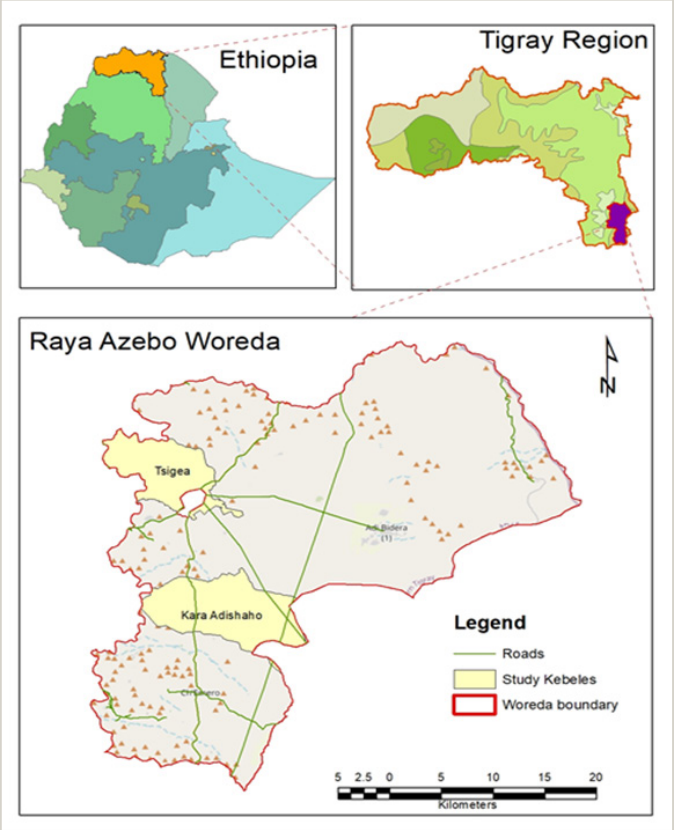


Figure 5: Map of Raya-azebo woreda and study kebeles

Table 3: Education level of surveyed HH head

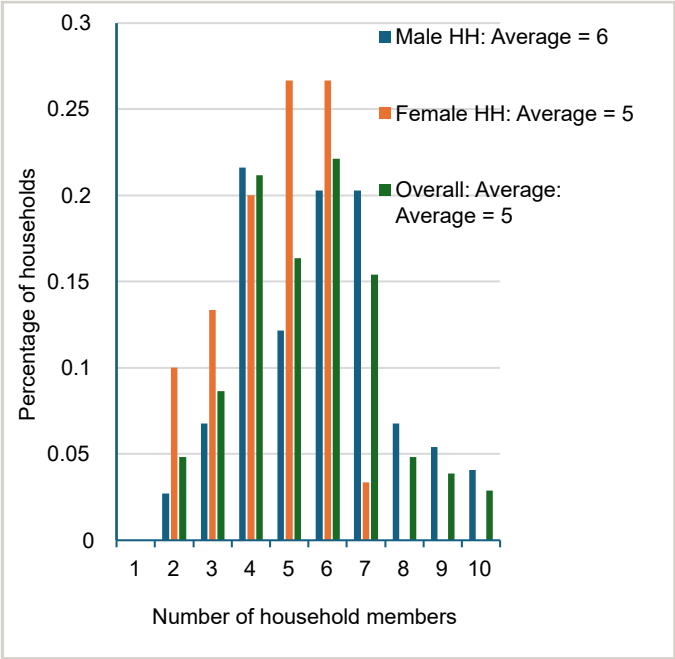


Figure 6: Family size of surveyed HHs

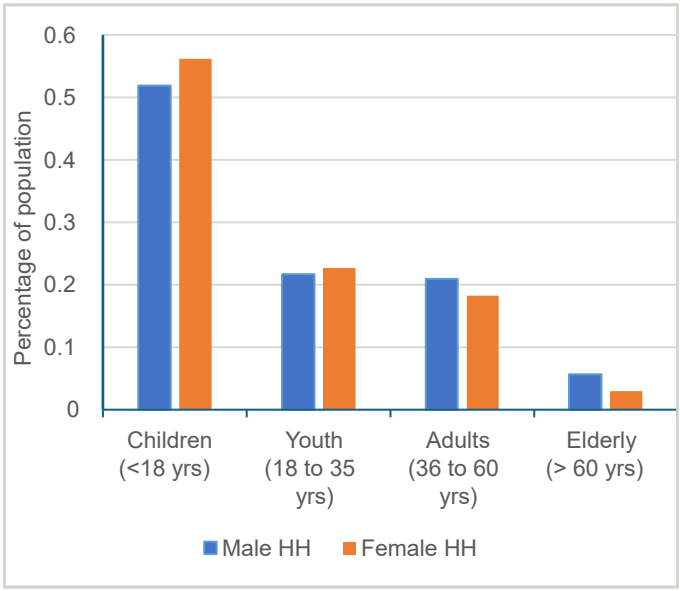


Figure 7: Age category of surveyed HHs

Educational level	Male head %	Female head %	Total %
Doesn't read and write	59	86	67
Adult/religious education	8	0	6
Primary school	27	10	22
Secondary School	3	3	3
Diploma and above	3	0	2

Priority topics identified and validated by stakeholders

- Increased literacy rate, especially for women
- Introducing birth control methods

2 Agro-ecological and environmental conditions

Secondary data, obtained from the Raya-azebo office of agriculture (Annual Agriculture report, 2020) indicates that the size of Raya-azebo *woreda* is 2,132.83 square kilometer. The *woreda* comprises altitudes ranging between 1000 and 1660 meters above sea level (m.a.s.l.). It has majorly intermediate (semi lowland) agro-ecology condition. The mean annual rainfall varies from 400 to 900 mm, usually from July to august ('kremt'). The mean daily temperature ranges between 25 to 35 ºC (S. Welderufael et al., 2023).

The majority of the *woreda*'s topography is flat land, and the major soil types of the *woreda* are vertisols, cambisols, leptosols and fluvisols.

The major crops grown in the area are sorghum, teff, maize and chickpea. Problems surrounding rainfall variability (Late onset of rain, early cessation of rain, uneven distributions of rain) are increasingly affecting crop production. Livestock, especially the oxen which provide the draft power used for land preparation plays a major role in the farming system.

Changes in rainfall distribution (drought) and increasing temperatures are the main impact of environmental degradation in the *woreda*. This decreases agricultural productivity and has impact on the overall livelihood of farmers. Another major problem related to environmental degradation is land degradation (soil erosion, deforestation and poor fertility).

The lack of grazing land in the study *kebele*s is considered to contribute indirectly to deforestation because farmers are forced to feed their animals from forest land. In Kara kebelle another impact of environmental change is the change in land use whereby forested lands have been converted to barren land as a result of excessive deforestation.

Drinking water in the *woreda* is water pumped from underground reservoirs because the area is low land and rivers do not flow the whole year. Irrigation water is also pumped from underground reservoirs, but people around the water source use it for home utilization too. On the other hand some villages of Tsgea and Kara-adishabo *kebele*s get seasonal irrigation water from high land parts of another *woreda* (Endamokoni) as flood irrigation. Although the area is known for its irrigation farming and that it is a suitable area for market oriented production, still most of the farming households in the *woreda* do not have access to irrigation. In addition, shortages and disruptions in the electricity affect potential utilization of irrigation

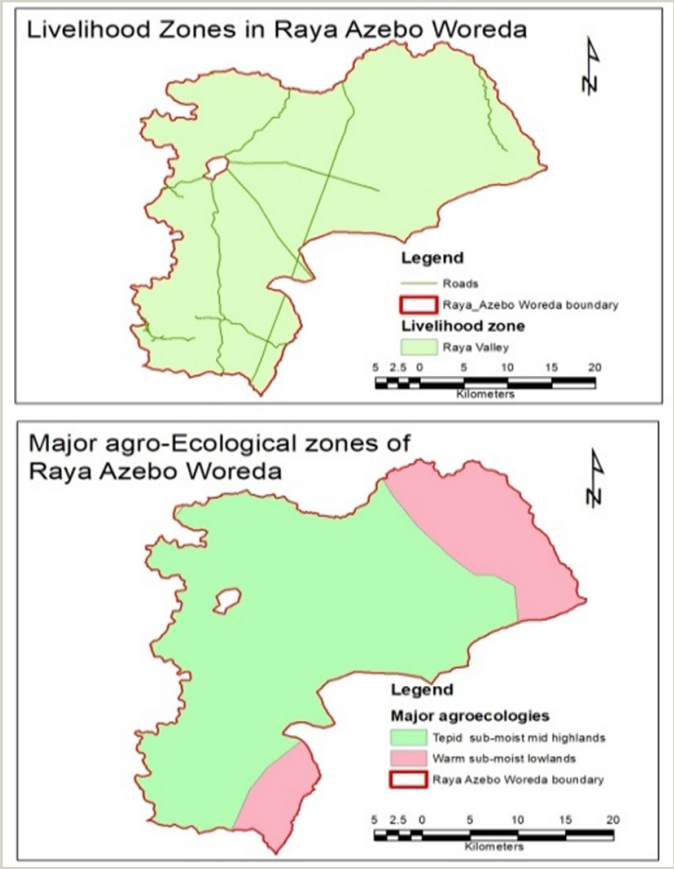


Figure 8: Livelihood zones and agro-ecological zones of

water. In Kara-adishabo *kebele*, three out of four villages have access to irrigation (Coban, Kara and Arada-mangudo). There is no river in the *kebele*, but, during certain seasons there are floods from highlands of neighboring districts. Farmlands and households located near to irrigation site and near sites that receive flood waters from highlands of neighboring districts have access to irrigation.

The identified and validated priority topics underscore the importance of anticipating the future impact of environmental degradation and climate variability on the food system. A future-proof food system will need to be resilient, to adapt to climate variability and to mitigate 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
- Improve access to electricity and power availability
- Improve water source availability options

3 Agricultural production system

Mixed (crop-livestock) production systems dominate much of the agricultural production of both Tsgea and Kara-adishabo *kebele*s. Crops are produced under rain-fed conditions (kiremt and belg) and with irrigation water. Animal production, fatting (oxen and sheep) and poultry production are also common practices in both *kebele*s. The main land use types in the study *kebele*s are arable, communal land, homestead and forest land. There is no grazing land in both study *kebele*s. The absence of grazing land generates conflicts between farmers and forest guards when animals enter restricted forestland. In addition farmers from Tsgea mention they are losing their fertile farmland which is increasingly used for construction and urbanization (Mokoni town).

A community mapping exercise showed that most of the flat lands are used for crop production. Also, most of the areas that have access to irrigation are those who are near to electrical motor pumps and hills.

Crop production is the dominant agricultural activity in the *kebele*s. Sorghum, teff, wheat and chickpea are commonly produced crops in Tsgea. The commonly produced crops in Kara are sorghum, teff and chickpea. Crop rotation (sorghum, teff and chickpea) is the most dominantly used cropping system in the whole *woreda*. But crop production needed to be diversified further.

There is a focus on commercial (market oriented) commodities using rain fed and irrigation in Tsgea and Kara adishabo *kebele*s. Teff, sorghum, chickpea, maize and vegetables (onion, tomato, cabbage, sweet potato and potato) are the main commercial agricultural products for income generation. In addition fattening of animals (goat, sheep and poultry) are the main commodities used as commercial source of income for farmers in the *woreda*.

The *woreda* has two main crop production seasons. The main production season is from May to December and the irrigation production season takes place from half December to April.

In the *woreda*s land preparation mostly takes place from February to May, using oxen. Production date for sorghum is from May to December, teff is mostly planted in the end of July and August and chickpea is usually planted in August and early September. Weeding mostly takes place in July and August for rain fed crops and harvesting time is mostly around November and December.

Major challenges associated with crop production are erratic rainfall, high work load for women, disease infestations and the availability of limited number of water points for irrigation.

Most farmers in the surveyed *kebele*s produce sorghum (86%), teff (70%), maize (14%) and chickpea (12%). But productivity is low compared to the average productivity that could be achieved in the area (according to annual agricultural report (2020) potential productivity of teff in the area is 17 qt/ha, maize 40 qt/ha and sorghum 70 qt/ha). The average productivity of chickpea in the area is

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 %
Sorghum	86	8	7	62	10	11	20
Teff	70	25	8	44	4	4	13
Maize	14	13	13	53	7	13	7
Chick-peas	12	8		58	8	5	10

Table 5: Experience in agronomic practices

HH head	Intercropping %	Relay cropping %	Crop rotation %	Agro-forestry %	Green manuring %
Male	4	0	77	12	1
Female	3	0	47	0	0
Overall	4	0	68	9	1

[2] *h10 Quintals = 1 metric tonne*

low, at 10 qt/ha. All HH have limited availability and access to improved varieties, this situation has worsened since the war started in 2020. Currently, the agricultural input delivery system is not recovered to what it was before war 2020. So that improved seed is not delivered to most of farmers for both crops. There are few supports for agricultural activities, from NGOS and research centers, but this support cannot cover all farming households. According to surveyed households, for the production of teff, the use of improved seed is better. This is because improved seed of teff introduced to the *woreda* by research center is well adopted. Farmers have little experience in the use of pesticides, in both major crops. A relatively high percentage of farmers used pesticides for production of sorghum because of stalk borer (pest in sorghum).

Most farming HHs that engaged in the baseline survey have experience with crop rotation (Table 5). However, continuous cereal-dominated crop rotation is a common practice in both study *kebele*s. Crop rotation (sorghum, teff and chickpea) is the most dominantly used cropping system in the *kebele*s.

Farming HHs are applying different soil and water conservation and soil fertility management practices such as application of compost and utilization of manures, etc. The baseline survey showed that a small number of farming HHs have experience with inter-cropping and a very limited number of farmers have experience with agro-forestry (Table 5).

The baseline survey indicates that MHH apply more agronomic practices compared to FHH (Table 5), it's because mostly FHH do not have enough human power and financial capacity.

Both *kebele*s are considered commercial areas and therefore the demand for agricultural inputs and technologies is very high. Nonetheless, the recent conflict affecting Tigray have caused a complete collapse of the input delivery system. Even before the war, the input as well as the extension system was constrained by a series of challenges. In group discussions participants mentioned that there is limited availability and access of agricultural inputs and technologies. They explained that the price of inputs is very high and that there is a general lack of improved crop varieties, poor extension services, a lack of agricultural machinery and post-harvest technologies. In addition diseases and shortage of irrigation and rain water were mentioned as challenges.

The *woreda* has great potential to strengthen and diversify its agricultural production, enhance the food and nutrition

security of its inhabitants and improve their level of agricultural commercialization. But, there is a need for integrated food system development strategies that aim to enhance the availability and improve access to agricultural technologies. On the other hand, there is a potential to strengthen the extension and advisory services, and by doing so, support farming HHs to advance their practical awareness about climate smart Sustainable agricultural practices (i.e. integrated pest management and integrated soil fertility management practices). Customized extension has the potential to support vulnerable groups of the population to secure access to healthy diets and income generating opportunities.

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

- Affordable agri-inputs available (including fertilizer
- Strengthen extension services and provide customized extension services for women and youth
- Increased availability and access to improved technologies including an effective distribution system
- Promote sustainable agricultural practices such as Integrated Pest Management & Integrated Soil Fertility Management

Kara Adishabo Kebele agriculture field

4 Markets and value addition

The provision of basic market information is a service that aims to increase the efficiency of agricultural markets and contribute towards overcoming issues of market failure based on asymmetric access to basic market information. Public provision of market information aims to reduce asymmetry of information in the marketplace. Data obtained from the baseline survey (Figure 9) shows that most farming HHs (87%) have access to market information, which they obtain through a variety of sources. FHHs (90%) had more access to market information compared to MHHs (85%), it's because mostly women are the one who is responsible for selling and buying products. Most of the farmers (39%) access market information through neighbors, peer farmers (21%), traders (19%) and cell phone (9%). A very small proportion of farming HHs obtains market information from other sources like radio or friends and family (Figure 10).

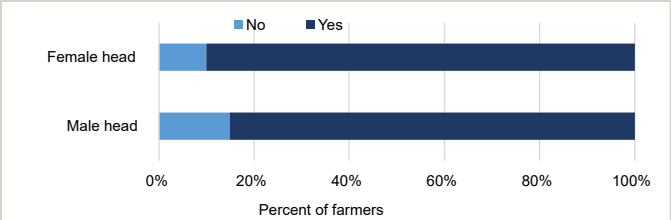


Figure 9: Proportion of households with access to market

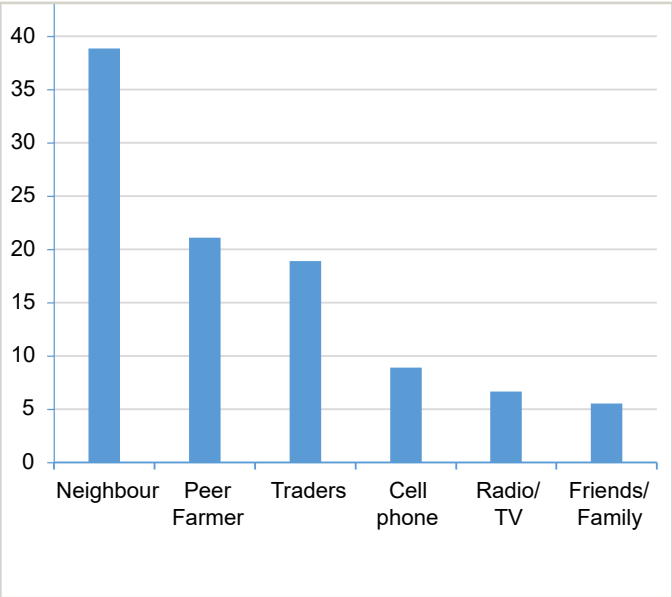


Figure 10: Source of market information

The survey assessed the means used and the distance that farmers travelled to sell their produce. Households from Kara used more vehicle and bajaj than HH from Tsgea (figure 11). 90% of the HH in Kara used vehicle and bajaj whereas only 19% of surveyed household from Tsgea use it. Most farmers (47.6%) in Tsgea *kebele* use animals as a means of transport to take their produce to the market. The average time spent travelling from the farm to the nearest market using animals as a means of transport is 45 minutes. For surveyed households in kara *kebele* it is 37 minutes and for households in Tsgea *kebele* it is 53 minutes.

The food system appraisal showed that there are limited

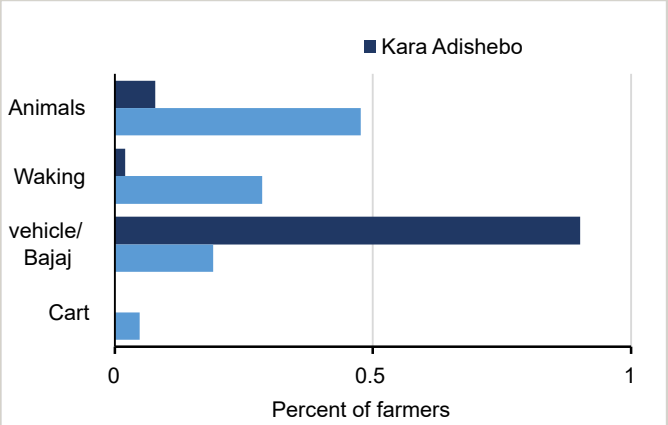


Figure 11: Means of transport to market

local market places in both Kara and Tsgea *kebele*s. The Mokoni market in the *woreda* center town, is located 10 kilometers from Kara and 5 kilometers from Tsgea. This market serves as the primary center of trading for Kara and Tsgea HHs. As a result, farming HHs incur transportation costs if they want to sell their agricultural produce on this market, or if they want to purchase food products specially kara residents. Kara kebelle has an asphalt road and Tsgea has all-weather road connecting it to Mokoni town. The neighboring *kebele* town of Kukfto is also an important small town for Kara's farmers where they go to sell their livestock and cereal products. Data generated in the baseline and focus group discussions revealed the absence of medium and large-scale businesses that are working with or adding value to raw agricultural produce. Market prices fluctuate for most crops throughout the year; they increase from July to September, when the supply is constrained, and drop from December to January when most of the crops have been harvested and there is a supply glut.

In both *kebele*s the main challenges in relation to marketing include high price of inputs, lack of diversified products for market, lack of transportation, low price of

products, shortage of packing materials and containers, poor quality of inputs/products and absence of, or long distance to markets (figure 12).

As a result of the dialogues maintained in the RFSA investments to support the development of a fully-fledged local food environment has been prioritized by stakeholders. This local food environment would generate a physical location where farmers can sell and buy diverse,

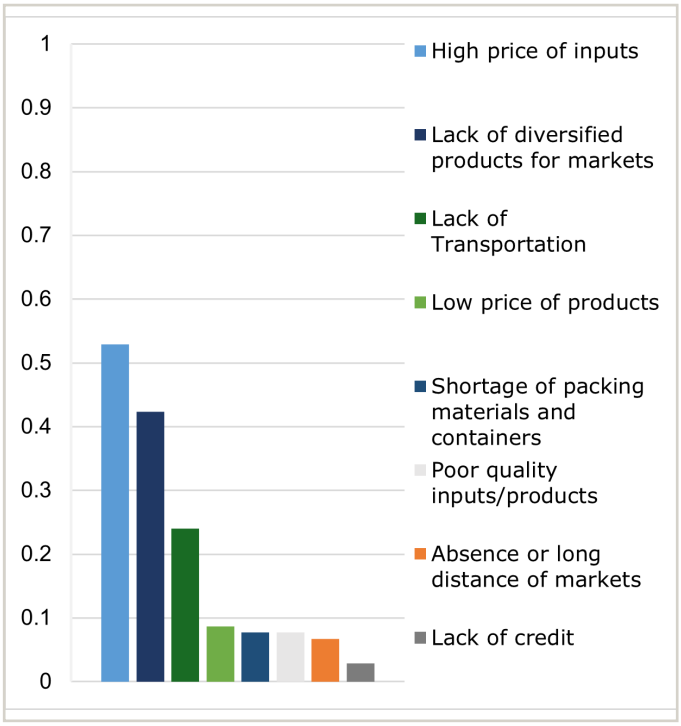


Figure 12: Challenges faced in marketing

healthy and safe food products. Strengthening the local food environment has the potential to dynamize the local food system by supporting exchange and distribution of diverse food items produced locally and traded regionally.f the dialogues maintained in the RFSA investments to support the development of a fully-fledged local food environment has been prioritized by stakeholders. This local food environment would generate a physical location where farmers can sell and buy diverse, healthy and safe food products. Strengthening the local food environment has the potential to dynamize the local food system by supporting exchange and distribution of diverse food items produced locally and traded regionally.

Priority topics identified and validated by stakeholders

- Support for bottom-up *woreda* development planning and prioritization approaches.
- Development of full-fledged local food environment for exchange and distribution of locally produced and regionally traded food items
- Improving local food processing capacities and technologies
- capacitating on business development, post harvest

Local fruit and vegetables market
Photo taken by: Mizan Amare

5 Credit and financial services

Before the outbreak of the war in Tigray (2020) microfinance was main source of finance for agricultural activities. Financial institutions are currently returned to service, but the majority of programs focusing on the jobless youth and woman are not yet functional. This results in high out migration of youths and it has indirect effects on peace and instability as a commonly witnessed trend is that unemployed youths engage in illegal activities.

The data from the RFSA show that a number of the preconditions to access credit imposed by MFIs, such as having access to collateral have excluded poor farming HHs, women, landless HHs and the youth from accessing credit services. In addition, resource poor HHs are reluctant to take out loans as they are afraid of failing to repay their loans.

Farmers mainly complain about collateral and interest rates for loans. Landless youths could not access credit because of lack of collateral and farmers which have land have commented that the interest rate of the loans is high and difficult to be profitable at that rate. Another problem specified for Kara *kebele*s is that most of the residents in this *kebele* are Muslims. Muslims require customized saving and credit institution with specific criteria. Due to a lack of these types of organizations and services the utilization of financial services is very low. In addition, the short duration of the credit period, the relatively low amount of credit that can be obtained and the low saving culture are primary reasons affecting rates of people accessing credit. The baseline survey clearly shows that there are a very limited number of community credit institutions which provide credit with low interest rates.

Most of the households who use credit have loans from informal source than formal (figure 13). This is due to the formal credit system criteria's (collateral) and complicated bureaucratic procedure. Formal sources from which farmers are taking credit include amongst others non-governmental organizations, banks or financial institutions, micro-finance organizations including village saving and loan associations, rural savings and saving cooperative organizations. On the other hand informal source includes informal lender, friends or relatives and informal credit/savings groups. The proportions of HHs which have access to credit from formal sources are 7% and informal 15% (Figure 14). There are insignificant differences between MHHs and FHHs. Most MHHs and FHHs accessed loans from informal sources.

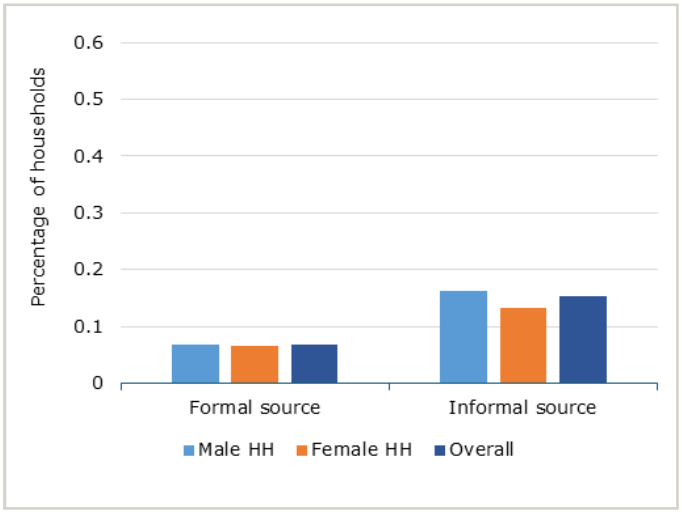


Figure 13: Access to credit

The topics that have been prioritized in this particular domain correspond to these specific challenges are: There is a need to improve access to financial services and credit provision. Currently there are insufficient options to access and obtain credit to purchase agricultural technologies. In addition, there are limited credit facilities for SME's and entrepreneurial investments in the agri-food sector. There is a strong need to develop and implement innovative and inclusive finance instruments, which are customized and attractive for women and youth, to strengthen the skills and competences of emerging entrepreneurs

Priority topics identified and validated by stakeholders

- Improve local access to financial services and credit provision
- Develop innovative mechanisms for local credit provision that are inclusive for women and youth, have low interest rates and are administered and managed locally
- Improve knowledge and skill on entrepreneurship, asset building and financial management
- Improving different financial provision mechanisms that can support job creation

6 Food and nutrition security

Dietary diversity is extremely low in both researched *kebele*s and there are clear gendered differences around food and nutrition security. About 30% of FHH are moderate food insecure compared to 20% of the MHH. FHH particularly experience more food insecurity, 23% of FHHs are severely food insecure whereas MHHs are 11% (Figure 14).

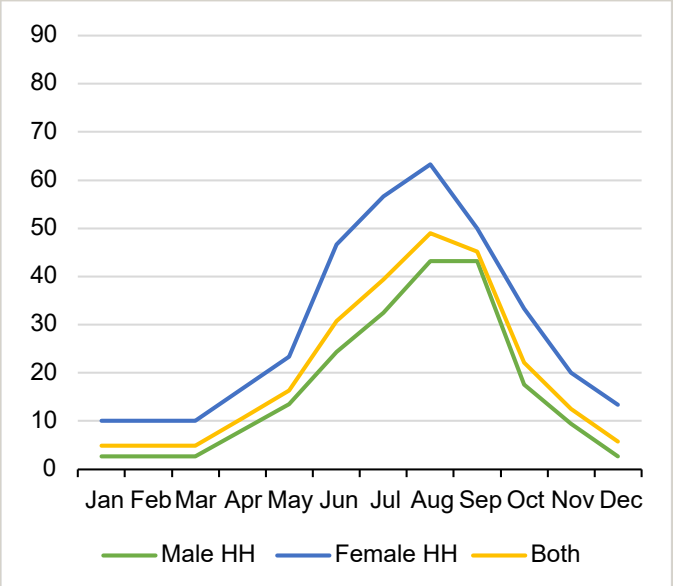


Figure 14: Percentage of HH having insufficient food in different months of the year

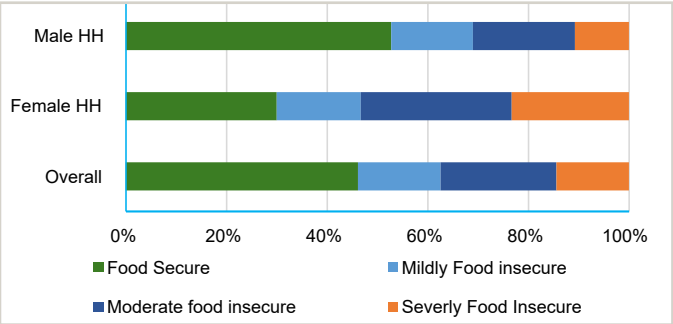


Figure 15: Percentage of HH classified in different stages of food security[3]

Both man and woman group explain that Food scarcity in Kara is most severe throughout July, August and September. In Tsgea, the most severe food scarcity months are September and April (figure 15). It's because in April most of main season produces are already finished. The survey and focus group discussions showed that a majority of HHs depend on their own production for the food they consume.

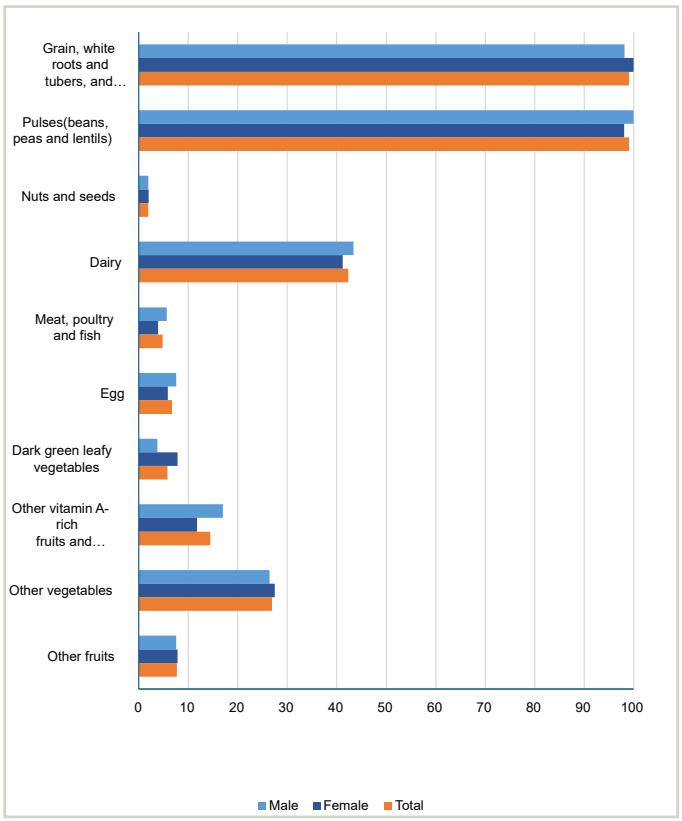


Figure 16: Percentage of HH consuming food group in the previous day to the interview

People in the study *kebele*s consume a low variety of different foods and the diet consists mainly of grains and pulses (Figure 16). On average, only 3.1 different food groups are consumed and diets consist mainly of grains and pulses, which is far below the recommended score of 5 food groups[4]. There is little difference between men and women and between the two *kebele*s. Of 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 very likely.

Focus group discussions with women group in both *kebele*s showed that income (affordability of foods) and age are the main factors shaping people's food consumption. While the men group states that income/ wealth status is the only factor influencing diet. Men group explain that households having relatively higher income consume livestock products compared with low-income households.

Focus group discussions with men indicated that HHs with access to irrigated land were able to increase the diversity of their diets.

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

[4] https://www.fao.org/3/cb3434en/cb3434en.pdf

According to men group healthy meal includes enjera (teff), meat, milk, egg (30%), pulse (20%), fat and oil (10%), vegetables (20%), fruits (10%) and honey (10%). Similarly, according to woman group healthy meal includes Enjera (teff), Meat (goat), Vegetable (potato, cabbage), Porage with better and "ergo", and bread with milk.

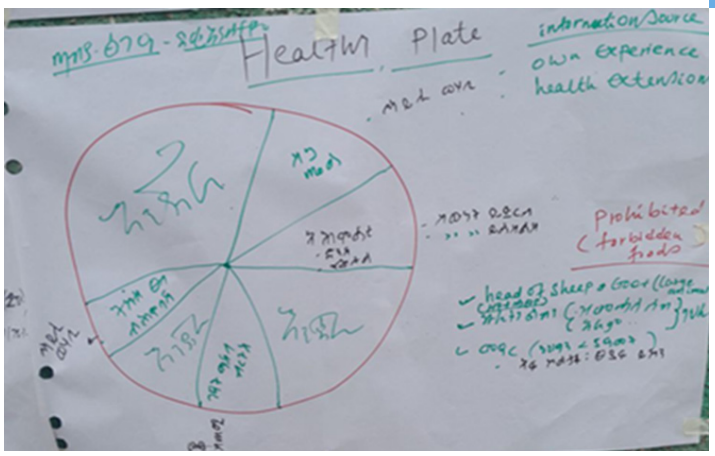
Most of focus group discussions participants indicated that they do not attend trainings on nutrition and healthy diets, provided by health extension experts. They still need to improve their knowledge and skills in the area of nutrition. Despite the *woreda*'s ideal climatic conditions for a variety of food products, there is a lack of awareness and knowledge about nutrition and a healthy diet as well as limited production and availability of nutrition dense foods.

Although female focus group discussions participants claim to be somewhat aware of some traditional storage methods, such as bags/packs, there appears to be a poor adoption of storage and harvesting practices.
There are traditional sayings to ban foods for some age/sex groups in the kebelle but they are not scientifically proved. Woman group from kara told that honey for child (to avoid effect on speaking), milk plus honey for young woman (to protect her virginity) and green pepper for young woman are forbidden. Woman group from Tsgea explain that eating meat from head of cattle/shoat for unmarried woman, kidney and heart of cattle/shoat for all age group and sex is prohibited. In addition they added that honey for child aged below five is not given. In Kara, cattle meat is prohibited for some Muslims, along with dead animals and food that has been touched by wild animals. Apart from this there are no barriers and sayings that can prohibit the community from eating foods which are included in the healthy meals.

The priority topics that were identified within this domain relates to a necessity to enhance people's awareness and consumption behavior towards healthy and nutritious diets. This requires multi-pronged and bundled approaches that focus on increasing diversity in diets, while working on behavioral change in consumption behavior and food handling practices in parallel. The priority topics that have been prioritized also underscore the necessity to work on food safety related topics and simultaneously improve the infrastructure to enhance HHs' access to safe water.

Priority topics identified and validated by stakeholders

- Increased awareness and knowledge on the importance of a healthy diet
- Increase the availability and use of storage and harvesting system
- Improving nutrient dense food (vitamin A & zinc rich product) availability
- Increased availability of safe water
- Increased dietary diversity



Healthy plate drawing from woman group (Tsgea kebele)

7 Inequalities based on gender identity and age

Youths and women in Kara and Tsgea, face disempowerment compare to man (Figure 18 and Table 6). The youths are challenged especially due to their limited access to and decision making on credit, no input in agricultural production decision, not speaking in public and lack of group membership. Women are overall less empowered than men due social norms. Access to and decision on credit, speaking in public and workload contributed most to women's disempowerment.

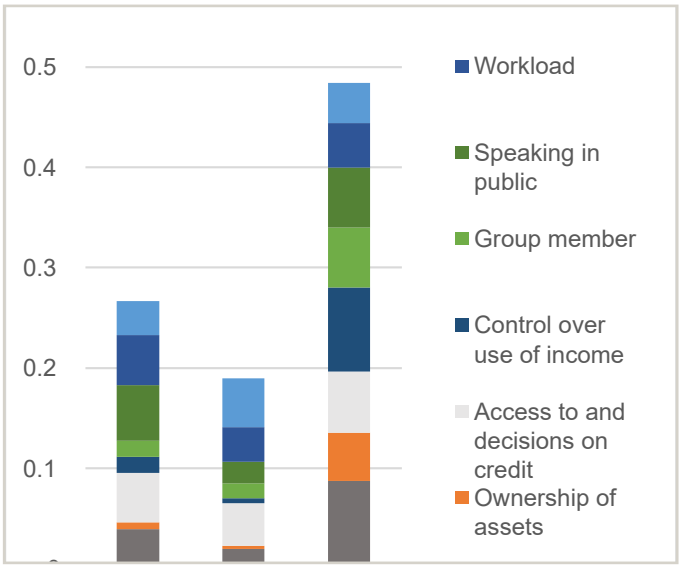


Figure 17: Women empowerment in agriculture (WEIA) score for women, men and youth in Raya-azebo. Weighted score of the % of people classified as disempowered in specific domain

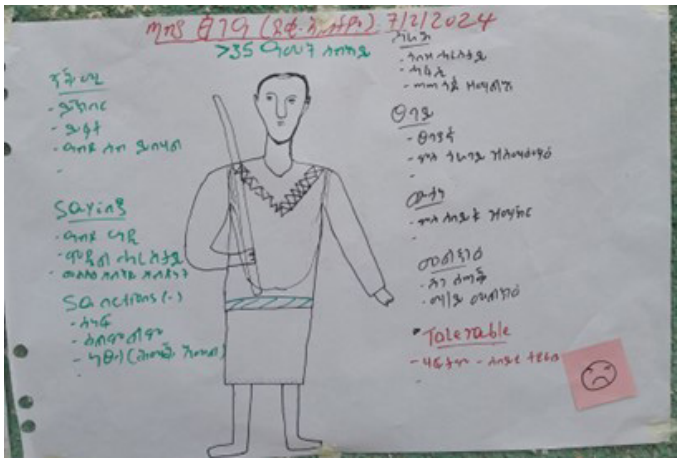


Figure 20: Drawings of ideal women as described by the participants of the FGD. Mentioned characteristics: humble, good cook, good advisor to husband, well dressed, peacefully with neighbour, silent, calm, patient, religious, good communicator to husband

Women's disempowerment and ideal women

Focus group discussions (FGD) revealed that women have limited access to cooperative membership. One characteristic of an ideal woman is to be silent and to be submissive to her husband. These social norms contribute to the difference in empowerment between men in women in the domains of access to and decisions on credit and speaking in public.

Women group from kara explains that remittance and income from agriculture control and access by both man and woman. Youths only control income obtained from wages. But woman group from Tsgea told that income from agriculture accessed by household head. Similarly, Man group explain that control and access of income from agriculture and remittance is by both husband and wife but mostly by male (household head). Most of the time income access by woman under the control of man. This implies that woman access the income to satisfy household needs and doing all the activities. But most the time they did not access the income on their own decision, this because of social norms.

According to both women and men group October and November are busiest months for woman doing harvesting and in house work. In addition, woman is busy starting from July and August in cultivation and weeding. Woman have high workload on unpaid home activities and field activities in which they did not participate in making decision. Weeding, cultivation, harvesting, and collecting harvested crop are agricultural activities woman usually involved in.

It was indicated that workload for women was higher than for men. However, the WEIA score (Table 6) shows that a high workload and absence of leisure contributes substantially to the disempowerment of both men and women. This discrepancy between WEIA and the focus group discussions could partly be explained by the fact that also men have a very high workload, especially during the cultivating season when the questionnaire was asked. Men spend on average 8 hr per day on productive and reproductive tasks while women spend on average 12 hr per day on those tasks.

Other high contributors to disempowerment for women were their limited access to and decisions on credit. 81.6% of women were disempowered in this domain (Table 6). The financial system was stop functioning due to war effect but currently there is some progress to start over. Nonetheless the focus group discussions highlighted that access to finance is limited due to short credit time, low amount of credit, high interest rates, the requirement of collateral and low saving culture. These challenges were experienced by all people and not women specifically.

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	19.4	5.3	81.6	8.3	18.4	55.3	52.6	36.8
Men	10.0	2.4	78.0	2.4	14.6	22.0	41.5	51.2
Youth	45.0	36.0	96.0	41.7	60.0	60.0	44.0	40.0
All respondent	20.9	11.5	83.7	13.9	26.9	43.3	46.2	43.3

Men's disempowerment and ideal men

Men were the most empowered, when compared to women and youth. Nevertheless, the insight from the baseline revealed that a high percentage of men are disempowered in some domains. As can be seen in table 6, men tend to be disempowered in the domain of access to and decision on credit (78%), limited leisure time (51.2%) and workload (41.5%).

The FGD showed that men face similar challenges as women with regard to access to finance. High workload and limited leisure time for both men and women were main contributor to their disempowerment. However, men and women have different responsibilities and roles. Being hard worker was a character trait mentioned for ideal man.

Youth disempowerment

Young people (between 18 years and 35 years) that are not HH heads are most disempowered compared to men and women above the age of 35 (Figure 17). Most young people are disempowered in the domain of limited access and decision on credit (96%), group membership (60%) and speaking in public (60%) (Table 6). Furthermore, a high percentage of young people were disempowered compared to men in the domains of decision making on production and inputs (45% for youth vs. 10% of men), ownership of assets (36% for youth vs. 2.4% for men), use and control over income (41.7% for youth vs. 2.4% for men).

From the focus group discussion lack of access to land (mostly used as collateral) is the main challenge of youths in the study *kebele*s which contributes to their disempowerment. Due to this they only work seasonal off-farm activities and did nothing the rest of the year rely on their families for basic needs. So that access to land, credit and irrigation are critical issues to youths to involve them in productivity as well as avoiding problems associated with youths' unemployment (migration and criminal activities).

Young people were more empowered in the domain of workload compared to women above the age of 35 (44% youth, 52.6% woman).

The focus group discussions suggest that disempowerment is probably different for young men and women and the low empowerment could partly be explained by gender inequality. Young men and women have different tasks than older people, for example, cleaning, cooking and watching toddlers were seen as specific tasks for young women while looking after animals were mainly seen as a task for young men.

The insights obtained from the focus group discussions and the baseline correspond to a large extent, with the priority topics regarding social and economic inclusion, that were identified and validated by stakeholders in both locations. Among the priority topics, we find challenges that the youth encounter in terms of access to employment opportunities, administration support and access to land.

Enhancing the social and economic inclusion of women and youth can bring significant positive change in food system outcomes. Effective transformation of the food systems will require integrated strategies addressing these topics.

Priority topics identified and validated by stakeholders

- Decrease the workload of women
- Increased access to financial services and credit
- Equal payment for female laborers
- Increased job opportunity, especially for youth
- Improving input and customized extension service for youth
- Increased decision making power over household resources for women and youth.
- Increase cooperative membership opportunities for women and youth

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

8 Resilience

In the last three years there were shocks in Raya-azebo *woreda*. These shocks identified through RFSA include Covid 19, war, locust and drought. These shocks worsen life of farmers in the area specially woman and youth (especially due to war). The causes for these shocks are goes beyond the area although activities in the area might have contributions. Cause of drought is expected to be the highly deforestation going on in the area and global climate change. On the other hand the war was a result of political instability which was happen in the whole country. Women and stakeholder group put war as number one shock considering its consequences. But man's group put drought as worst shock because it's complicating their life style. On the other hand stressors in the last three years includes environmental degradation, inflation, political instability, hunger and trauma. Some of the stressors are stayed more than just three years. But trauma in woman which comes from the war started in 2020 is critical to consider. The war took many lives of youth because of this parents especially mothers are still in stress. Political instability is a cause for the war but it is also continues to be a stress to people fearing it will happen again. Environmental degradation is ranked as number one stress by man and stakeholder group because it is bringing great negative impact in agricultural productivity. Woman group put trauma from the war as number one stress this is because the natural tendency how woman care about their children.

The immediate effect of shocks and stressors in the area are low production, inflation (low supply to market), loss of human lives (war) and trust issue on politics. Low production highly affects woman and children as well as it's also become a reason for a migration of youth to fulfill basic family needs. Shocks and stressors have also environmental, production and marketing impacts through time. War has direct and indirect impact on environment. Direct impact is destruction of natural resources by weapon and the indirect impact is change in climatic condition. Both above mentioned shock and stressors have decrease productivity which in turn have effect on supply and overall marketing of agricultural and non-agricultural products. Loss of soil due to environmental degradation and lack of access to agricultural inputs (expensive) due to war are other impacts of shocks and stressors. The overall impact for farming community in Raya-azebo *woreda* is low level of production and hunger.

According to woman group drought, locust and trauma are the most shocks and stressors that worried them. The man group also told that they are worried most about drought, pest, disease and political instability. In general, Productivity decrement, hunger, disease and loss of life are things which worried farmers about shock and stressors. All community members are vulnerable to the shocks and stressors but woman (which are responsible for children), children (lack of food) and youths (migration) are the most vulnerable. The capacity, the area has to overcome shocks and stressors are suitable environment for animal and crop production. The availability of institutions such as agriculture, health, and education is a necessary capacity for the farming community in the area, even if it is currently poorly facilitated. In addition different experience of farmers in agricultural production and environmental conservation practice as well as skill and experience of agricultural workers are capacities of the study area. As preparation mechanism individual farmers choose varieties, also soil and water conservation done at individual and community level for some shocks and stressors.

As mitigation mechanism individual farmers use manure instead of organic fertilizer (for environmental effect), traditional agronomic practice (for disease effect) and diet change (for drought effect). In addition using diversion of floods to farm area (for drought effect) and mobilize people to safe area (for war effect) are also used as a mitigation strategy by the community. The coping mechanisms for drought are mainly afforestation as well as soil and water conservation. Also social safety nets, emergency relief, food and agricultural inputs aid are the usual and use full recovering mechanisms from shock and stressors in the in the area.

In the area there is no mechanism of transferring shocks and stressors at individual farmer level. So that, developing different grain and life insurance institutions which are compatible with smallholder farmers is critical to transfer shocks and stressors on fair price to individual farmers.

Among the priority topics, identified include the knowledge and practice of weather informed agriculture, early warning and action for shocks and recovery options

Priority topics identified and validated by stakeholders

- Improving awareness and knowledge on weather informed agriculture
- Introducing insurance and risk transfer options
- Improving early warning and safeguarding options to minimize effect of shocks and stressors

9 Policies and government support

The baseline survey and focus group discussions 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 Raya-azebo are:

- 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 and
- Partnerships for integrated food system policies, planning and governance.

Social and economic inclusion for local economic development

This thematic area encompasses enabling programs focussing on the extension system, market system, the input support 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 shop) 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 information, provision of financial support and seed capital for development of the agri-food sector and 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. Successful 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 cultivars, water management and conservation practices and, integrated soil fertility management. There is a need to expand on programs and policies promoting the dissemination and uptake of these types of 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 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 health.

Opportunities and challenges for Yilmana Densa 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 formation of acid soils due to excessive use of fertilizer. 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.

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List of abbreviations

AEZ	Agroecological Zones
DA	Development Agent
FGD	Focus Group Discussions
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 tonne)

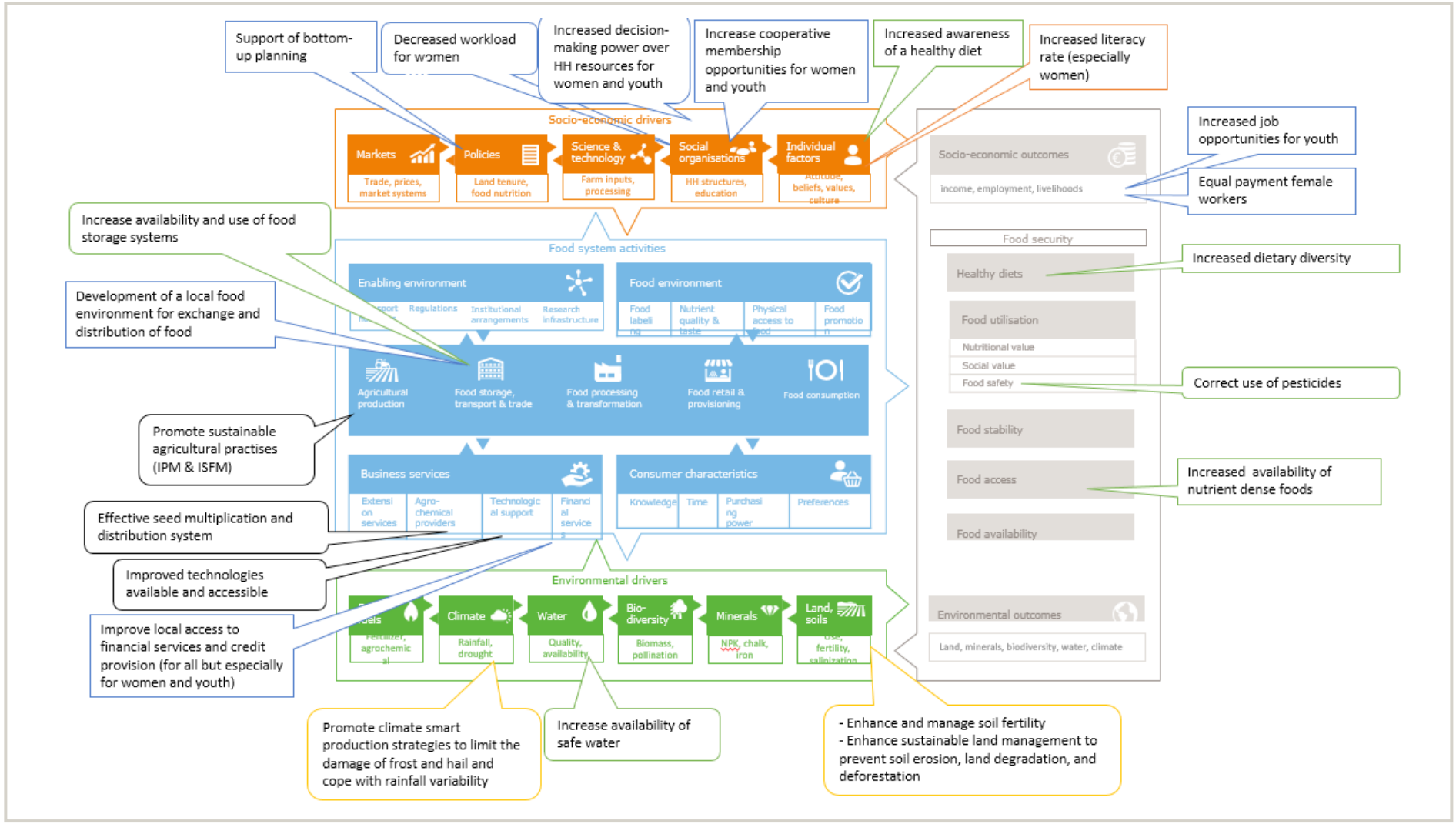

Figure 21: Identified priority topics in a food systems perspective (following by Berkum et al., 2018)

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