

# Onion Value Chain Analysis in North Mecha, Bahir Dar Zuria, Fogera and Dera Woredas of Amhara National Regional State

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Submitted to  
Programme for Agribusiness Induced Growth in the  
Amhara region (AgroBIG)

August 2018

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## ACRONYMS AND ABBREVIATIONS

AGP	Agricultural Growth Programme
ARARI	Amhara Region Agricultural Research Institute
ARDPLAC	Agricultural Rural Development Partners Linkage Advisory Councils
ATVET	Agricultural Technical and Vocational Education and Training
BEE	Business Enabling Environment
BoA	Bureau of Agriculture
BoFEC	Bureau of Finance and Economic Cooperation
BoIUD	Bureau of Industry and Urban Development
BoT	Bureau of Trade Industry and Market Development
CSA	Central Statistics Authority
ECX	Ethiopian Commodity Exchange
ESE	Ethiopian Seed Enterprise
FTC	Farmer Training Centre
GAP	Good Agricultural Practices
GM	Gross Margin
GoE	Government of Ethiopia
GTP	Growth and Transformation Plan
IDRF	Innovation, Demonstration and Research Fund
m.a.s.l	metres above sea level
MFA	Ministry for Foreign Affairs of Finland
MGF	Matching Grant Fund
MoFEC	Ministry of Finance and Economic Cooperation
NGO	Non-Governmental Organisations
PIF	Policy and Investment Framework
PSU	Programme Support Unit (AgroBIG)
SNNP	Southern Nations, Nationalities, and Peoples
SNNPR	Southern Nations, Nationalities, and Peoples Region
SSI	Small Scale Irrigation
TIN	Tax Identification Number
UARRP	Universal Access to Rural Road Programme
VC	Value Chain
VCA	Value Chain Analysis
VCD	Value Chain Development
VCF	Value Chain Fund
WoA	Woreda Office of Agriculture
WoFEC	Woreda Office of Finance and Economic Cooperation
WoT	Woreda Trade Industry and Market Development Office
WSC	Woreda Steering Committee
WTC	Woreda Technical Committee
Belg	short rainy season, January to June
Kebele	neighbourhood (location of about 5,000 people)
Meher	long rainy season, June to December
Woreda	district

## **TO THE READER**

This document is an update of a value chain analysis on onion that was commissioned and facilitated in 2016 by AgroBIG.

For the update, 41 informants in 4 districts, North Mecha, Bahir Dar Zuria, Fogera and Dera, were interviewed, representing producers, brokers, traders, cooperatives and woreda, regional authorities. The data and narration that were presented in the original report from 2016 were updated accordingly.

The aim of this report is to give an overview of the current situation and projections regarding the supply of onion bulbs from woredas that AgroBIG is operating, possibilities for value addition at different stages of value chain and respective potential for income and job creation for the various value chain actors, and to present prioritized recommendations to AgroBIG for development interventions to assist the programme attain its goals. Due to the nature of the assignment, which aimed at updating the already existing onion value chain analysis focusing only in the downstream side (marketing), rapid market survey was conducted in July 2018 in four project woredas namely North Mecha, Bahirdar Zuria, Dera, and Fogera. Rapid Market Survey is an efficient way to acquire knowledge about marketing systems, with a view to inform production and marketing strategies, policy processes, and the design and implementation of relevant interventions. It is also a process for discovering market opportunities and how to capture them through focus on an entire value chain.

The selected method to gather the marketing data was interviews using structured questionnaire with collectors or assemblers, brokers, wholesalers, retailers and with representatives of government institutions. For the purpose, controlled interviews were chosen whereby the same questions were asked to all interviewees within each stage of the chain to get comparable answers.

The upstream data are expected to be unchanged, and hence the consulting team focused only on the marketing analysis which includes (a) the end market conditions, (b) existence or absence of new marketing channel/s, (c) current prices, transaction volumes, and (d) whether there is new introductions in the value chains such as value addition practices. Therefore, questionnaires for marketing actors and office level data collections were used to gather information from all the four woredas, the regional capital, and other actors in the country.

Based on the survey, the most notable changes between the situation in 2016 and 2018 are (a) the support to seed supplier and marketing cooperatives, (b) the farmers' understanding on quality concept of onion has been to some extent improved, (c) seed quality control, certification, packing and labeling system was installed (Kudmi primary cooperative), (d) materials that help for post-harvest handling and transporting the produce (mule drawn carts) were provided, (e) collection centers were established, and (f) market information service delivery were supported.

As for the recommendations, for the remaining project period AgroBIG should work closely with implementing partners on solving production, quality, post-harvest handling and marketing constrains indicated in this document.

Addis Ababa, September 2018  
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## 1. EXECUTIVE SUMMARY

Onion (*Allium cepa*) is among the most popular vegetables in the world. Onion is a crop that is classified as a cool season crop. However, it can be grown in a wide range of climatic conditions. It is grown mainly for its bulb, which is used in every home in different ways, almost daily, across Ethiopia. Both production and consumption of vegetables in general and specifically onion has significantly increased annually in Ethiopia. The government's commitment to support farmers by investing large amount of money to expand irrigation schemes create conducive ground for onion production and thereby for improvement of farmers' income. According to Central Statistics Agency (CSA) data, the Meher season onion production reached its peak in 2015/16 with production level of 3,274,753 and 1,431,956 quintals in the country and in Amhara National Regional State (ANRS), respectively.

The Amhara region is one of the major onions producing areas in Ethiopia, and has seen an increase in onion production in recent years. Although there are indications that there is a good positive impact in the value chain, further promotion is needed on the gaps identified in this study and presented below in the report.

According to market survey results onion is widely consumed in Ethiopia in different traditional and modern dishes/foods. Very small volume of onion is exported to neighboring countries to earn foreign currency. According to the 2015 report of Ethiopian Revenue and Customs Authority (ERCA), about 443.8 tons of onion (0.14% of total production) was exported and 63,123 USD was obtained. On the other hand, because of the quality problem, short shelf life of local onion and supply shortage during off season period, the country imports onion from Sudan. Sudan's onion is well dried, of high quality and has long shelf life. Many literatures depict that well dried and properly stored onions can be stored for several months.

AgroBIG has been promoting onion value chain to benefit farmers as well as other actors. However, due to involvement of large numbers of brokers and poor market linkage facilitation, farmers are unable to sell onion directly to big buyers. The involvement of large number of brokers has reduced farmers' margin.

The study conducted in July 2018 revealed the following opportunities, constraints and solutions for onion value chain specifically for program woreda's and generally in the region.

### Opportunities:

- The high population growth, improved purchasing power of the community, and increasing demand from neighboring countries can be noted as opportunities for onion producers.
- The prevalence of irrigation schemes in Fogera and Mecha, access to infrastructures such as roads and electricity, proximity to the regional capital, and the presence of onion seed supply system built by AgroBIG are among the opportunities that the farmers are enjoying.
- The presence of huge ground water potential at relatively shallow depth in Fogera and Dera woreda.
- Availability of organized primary cooperative in all program woredas that can be promoted to union level

#### Constraints:

- Difficulty to get quality and certified seed. Even if AgroBIG supported seed multiplication cooperatives to multiply improved seed and disseminate to farmers in the last few years, they haven't had continuous production of seeds. These include Kudmi, Barad gafara and Niku Lesira seed multiplication and marketing cooperatives. On the other hand, Fogera seed multiplication and marketing cooperative, even if the seed is available, it seems that it is not affordable for low income farmers due to high cost. Moreover, the available varieties do not meet the minimum quality requirements of seed. Many illegal agro-dealers are supplying low quality seeds. AgroBIG, in its pilot phase, had initiated an improved seed system that is benefiting the seed multipliers and the overall onion producers in the region.
- Lack of market information and linkages
- Lack of strong farmers' organizations and consequently farmers' limited negotiation skills and power are pulling back farmers from getting good margin
- Entry barrier to Bahir Dar city's vegetable market and absence of open market for individual farmers, cooperatives and unions hinder them from using an opportunity to the produce directly to consumers.
- Labor shortage during peak periods especially at the time of critical agronomic practice like weeding. This results both in yield reduction and loss of quality, which in turn reduce competitiveness in the market.
- Lack of proper pre-harvest treatment and post-harvest handling technology. Farmers do not stop watering onion field three weeks before harvesting. This result in poor and inferior quality of onion with short shelf life and poor preference by traders. Moreover, absence of onion processing technology in the country except dehydration and solar drying. Some storage techniques are available at Melkasa Agricultural Research Center, which can be adopted to the project woredas.
- Low price during peak season due to high supply at the same time
- On the other hand, most of the farmers are still subsistence farmers and are not geared towards commercial production. Hence, there are constraints which make it difficult to respond well for the existing opportunities. Lack of good farm management and good agronomic practices that include improper soils management; absence of post-harvest technologies (drying facilities); little or no storage facilities; absence of processing options; quality input supplies (seeds, fertilizer, chemicals); influence of brokers in transactions; limited capacity of cooperatives to conduct collective marketing; insufficient working capital and difficulty to access credit; poor coordination of market actors; and lack of trust amongst actors are the some of the constraints.

#### Solutions which are presented as recommendations include:

- In order to tackle low price problem due to uniform cropping schedule, there is a need to plan staggered production so that the supply to the market will spread over extended time and the market will not be over saturated. Production of major vegetable crops in clusters and rotation of clustered fields should be implemented to extend the duration of the supply to the market at good price and to avoid or reduce pest damage.
- Establishing certified agro-dealers that can source quality and certified seed and other inputs from reliable source.
- Farmers should focus on market-oriented production with utmost quality.
- Farmers should be advised on pre-harvest water application in order to improve the quality of the onion at harvest. The right physiological stage when to stop watering should be understood by growers. This will enable farmers to obtain well-dried bulb and supply good quality onion with long shelf life. Farmers say they apply water even when the crop is about to be harvested because otherwise the soil will be hard for harvesting. This problem can be solved by using small machinery that can be used for potato and onion.



The machine is originally developed for potato harvesting but it can be applied and demonstrated for onion too, according to the manufacturers.

- Though there have been efforts to provide market information service to farmers, the implementation scale varies from woreda to woreda. Therefore, strengthening the existing market information system and sharing experience is necessary. For instance, Fogera woredas has a better market information system than others, and hence they can share their experiences to other woredas.
- Creating market linkage service mainly by Woreda office of Trade (WoT) in collaboration with Woreda Cooperative Promotion Office (WCPO).
- The existing irrigation water users and marketing primary cooperatives in Dera and Fogera woredas should be organized into a strong marketing union. Similarly, primary cooperative in Bahir Dar Zuria should be organized to form a union, so that the unions can engage in collective marketing at large scale or do processing activities.
- Vegetable grower primary cooperatives and unions should get access to plot of land in cities and market place to build stores and shops or rented store and shops in big markets (Merawi, Woreta, Bahir Dar and Gondar) so that they can use them as wholesale and retail centers in order to maximize their profit margin.
- One or more free open market places, just like other towns of other Regional states, should be built by Bahir Dar city administration in different directions so that individual farmers and cooperatives from surrounding woredas can be able to sell their produce to consumers or assemblers directly. This enables farmers to get good price as they can get final customers' price in a profitable manner without involvement of middlemen.
- Roadside retail market having shelter made from local material should be encouraged so that farmers and women can benefit out it.

AgroBIG's strategic intervention can be in creating a Multi Stakeholders Platform (MSP) to bring different actors of the value chain and governmental and non-governmental stakeholders to come together in every quarter and discuss on achievements of the plan, share best experiences, discuss on constraints encountered, devise solutions to the problems and finally develop action plans for the next three or six months and share responsibilities. Then AgroBIG team should make close supervision and follow-up from time to time. Each implementing partner.

## **2. INTRODUCTION**

### **2.1. Background about Value Chain Concept**

A value chain can be defined as the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final customers, and final disposal after use (Hellin and Meijer, 2006). Others defined value chain as “a key framework for understanding how inputs and services are brought together and then used to grow, transform, or manufacture a product; how the product then moves physically from the producer to the customer; and how value increases along the way (Webber and Labaste, 2010). The Authors went further thinking that the value chain perspective provides an important means to understand business-to-business relationships that connect the chain, Mechanisms for increasing efficiency, and ways to enable businesses to increase productivity and add value. Webber and Labaste (2010) indicates that value chain provides a reference point for improvements in supporting services and the business environment. This concept was supported by Turner (2011) and gave an understanding of how to improve the competitiveness of the chain whilst increasing participation in a manner that fairly distributes value down the chain. The value chain approach is now widely used as a pro-poor initiative in such a way that farming communities engage in market-oriented production and small businesses are linked to markets (Webber and Labaste, 2010).

A value chain can be complex and contain a big number of actors. Each actor can also be connected to more than one value chain. Therefore, it's important to know the aim of the study and the point of interest. Decisions can be made on where in the chain to start and what to include in the chain analysis (Kaplinsky & Morris, 2000). The first step in a value chain study is to identify the actors and the connections between them to get the chain mapped out. This can be done with a qualitative study, followed by a quantitative study when the map of the chain is completed. The quantitative study gives more information about activities and relations in the chain and makes the study more certain (Hellin & Meijer, 2006).

Accordingly, the need to analyze and update onion value chain is to understand whether the value chain is functioning according to its plan or not, and to understand the strength and weakness of its implementation and then to upgrade it if there is a need. Value Chain Upgrading Analysis examines practices within value chains that lead to improvement and the outcome of those practices. There is four different sources of upgrading the value chain: process upgrading, product upgrading and function upgrading.

### **2.2. Onion Value Chain**

Onion (*Allium cepa* L.) belongs to the genus *Allium* of the family *Alliaceae* which was believed to be originated in southwestern Asia, being the center of domestication and variability, from where it was spread first across the world and has been cultivated for over 4700 years as annuals for bulb production purposes (Brewster, 2008). Onion is considered to be among the most popular vegetables in the world. It is consumed in small quantity almost daily as a seasoning or flavoring of varieties of dishes, in many countries of the world. It is naturally packaged vegetables consisting of fleshy, concentric scales that are enclosed in paper-like wrapping leaves, connected at the base by flattened stem disc (Currah and Proctor, 1990). Onion is a crop that is classified as a cool season crop. However, it can be grown in a wide range of climatic conditions. It is grown mainly for its bulb, which is used in every home, almost daily, across Ethiopia. It is rarely used as a sole dish or in large quantities. Onion is valued for its distinct pungency or mild flavors and form essential ingredients of many dishes. Its main use lies in flavoring and seasoning of a wide variety of dishes, sauces, soup, sandwiches, etc. due to its aromatic and volatile oil, the allyl-propyl

supplied. As a constituent of a meal, both the green leaves and bulbs can be eaten raw, cooked or fried, or in soups and salads. Onion also has an important role as a medicinal herb in many communities, and is claimed to minimize high blood pressure and other heart diseases due to its favorable action on the elasticity of blood vessels.

It is a recently introduced bulb crop in the Ethiopian agriculture, and it is rapidly becoming a popular vegetable crop among producers and consumers. The crop is produced as a cash crop by small farmers and commercial growers especially under irrigated conditions compared to the traditional bulb crops, shallot and garlic, which are rainfed.

### **2.2.1. Importance to Ethiopia**

The production of onion crop is worldwide because of its wide benefits in our daily foods requirements. Onion is largely produced in the developed nations and has dominated in the international markets due to its higher quality production and longer storage life (Opara, 2003). China is the top producer of the world followed by India and USA (Manna, 2014, Kulkarni et al., 2014). According to world atlas (2017), the world total onion production is 74.25 million metric tons per annum out of this, China, India and USA produce 20.508, 13.37, and 3.32 million tons, respectively. In Africa, Egypt is the leading country by producing 2.208 million tons of onion per year for domestic and international markets that rank as the fourth of world producer. Countries like Turkey, Iran, Afghanistan, Brazil and South Korea are also largely producing and selling to international markets.

Onion is a high-value bulb crop that has produced by smallholder farmers and commercial growers for both local and export markets in Ethiopia (Aklilu, 1994). It ranked the second in production of all vegetable crops next to Tomato, which has been concentrated in the central rift valley of the country particularly in the upper Awash and Lake Ziway areas (Bossie, 2009). Onion is currently becoming a popular crop relatively despite to its recent introduction to the country because of its yield potential per unit areas, the ease of propagation method both by seed and bulb method, and the presence of high domestic and export markets (Asfaw and Eshetu, 2015). Hence, Nikus and Mulugeta, (2010) also elaborated the area under onion production is an increasing rate from time to time mainly due to the merit of production and ease of marketing purposes. This crop can be cultivated twice per year both under the irrigation and rain fed conditions in different parts of the country (Belay et al., 2015). However, the production and productivity of the crop are far below (10.02t/ha) the world average (19.7 t/ha) despite to its year-round production scenarios (FAO 2012). This low yield results indicate that the presence of a huge gap in production and productivity at the country because of the absence of improved cultivars, application of inappropriate agronomic practices and limited attention/awareness on the benefits of intensive production. Even though, Gebreselassie, (2013) pointed out as recently a little production progress has been observed after a government has reaffirmed its commitments to the agricultural sector in plan to scaling up the best practices by bringing up of the productivity of most average farmers, expansion of irrigation developments and production of high-value crops in suitable areas including of onion for smallholder farmers.

Onion, even though it was an introduced vegetable crop, it has got popularity both by farmers and consumers in Ethiopia. It is among the most important vegetables produced on a large scale. From an economic point of view, onion is an important crop for the country when compared to other vegetables. Currently, the crop is grown as cash crop in different parts of the country, mainly by small scale farmers, commercial growers and state enterprises. The Awash Valley and the Lake Tana Region are currently the areas where the bulk of dry bulbs and onion seeds are produced. At national level, onion production reached 293,887.59 tons in the 2017/18 production season (CSA, 2017/18).

### **2.2.2. Importance to Amhara**

Onion is an important crop in Amhara Region. The region contributed 54% of the annual production about 143,195.6 tons in the 2015-16 main season (CSA, 2015/16). Rapid expansion of onion production in Fogera, Dera and Bahir Dar Zuria woredas suggests that onion continues to have a competitive advantage in these woredas. In the 2011-2012 production season around 560 farmers, 192 of them women headed households, were producing onion in North Mecha. During the 2015-2016 season this number reached 1,579 farmers, 541 of which were female-headed households. The total area covered by onions increased from 70 ha in 2011/12 to 943.75 ha in 2017/18. In Fogera woreda, the land used for onion production has increased from 6,133 hectare in 2011/12 to 11,880.5 ha in 2017/18.

Although prospects for the crop seem to be good, the increased production must be accompanied by marketing support in order to bring about positive changes for the value chain actors and the farmers. Onion prices seem to be consistently high during the months of heaviest rainfall but vary significantly during the rest of the year. Therefore, opportunities exist to increase production and profitability. Unless the productivity and quality level can increase, the imported onion from Sudan will remain a strong competitor both in terms quality, shelf life and price. According to Export Genius, 2016, Ethiopia imported 4,920 tons of Onion from Sudan with total price 1,891,456.47 USD (including tax) from August to September 2016.

### **2.3. Infrastructure**

The road infrastructure has gone through major improvements in recent years. The government put one quarter of the total infrastructure budget into road projects to repair, upgrade and build new roads. A road fund has been created, funded by a fee included in the fuel price, to guarantee money for road maintenance (Ethiopian Government Portal [undated]). Ethiopia is land-locked and uses Djibouti's harbor for import and export of goods, this means road transportations with heavily loaded trucks over long distances. The poor infrastructure together with high transportation costs has negatively affected the economic growth. That is why Ethiopia is now planning new railway projects with a total length of 5,000 km, which will be completed by 2020 (South world web magazine, 2013).

### **3. CHARACTERISTICS OF ONION VALUE CHAIN**

#### **3.1. Onion production**

##### **3.1.1. Onions cultivation**

Onions are cultivated in many regions of the world, but mainly on the northern hemisphere. Onions are part of the Liliaceae family, of the genus *Allium* that contains several hundreds of species (Shigyo and Kik, 2008). The Latin name of the most common onions worldwide is *Allium Cepa*, which includes the red and yellow onion. *Allium Cepa* is the second most popular vegetable in the world following tomatoes (Desalenge and Aklilu, 2003).

Onions are treated as an annual crop even though it is biennial. The seed production requires two seasons since it takes one season for the onion to produce dry bulbs and another season for the production of the flower stalk, from which the seeds are harvested. Temperature is the one environmental factor that has the highest impact of onion growth. The optimal temperature condition for onions is mild climate around 21°C without any extreme heat or excessive rain. It takes almost 2 months for the onion seeds to develop seedlings, roughly 2 months for the seedlings to develop visible bulbs and then an additional 2.5 months from the stage of visible bulbs to maturity of the onions. Farmers raise seedlings in small plots then transplant the seedlings to bigger farmlands for onion bulb production in about 4 – 4.5 months. The plant takes up to 12 months to produce new seeds since it takes 5-6 months for flower stalk development from onion bulbs. Onion fields should be rotated with other crops at least every fourth year to prevent soil borne diseases. Improvements in soil nutrients (from compost, dung or inorganic fertilizers), water holding capability and texture can positively benefit the growth of onion bulbs. Examples of two inorganic fertilizers are DAP (Diammonium phosphate) and Urea. The amount of fertilizer needed is dependent on the soil type (Desalenge and Aklilu, 2003).

##### **3.1.2. Postharvest handling**

In Ethiopia, post-harvest losses for fruits and vegetables are estimated to range between 15% and 70% according to previous research of African fruits project. The country is ranked as one of the poorest countries in the world by the UNDP-index (United Nations Developing Programme, 2013). About 85% of the employments in Ethiopia are in the agricultural sector, which accounts for 46% of the GDP. However, the county's agriculture is vulnerable due to climatic uncertainties such as drought and excess water (CIA, 2013).

The post-harvest treatment required for the long storage of bulb onions is a thorough curing of the bulbs. Curing is a drying process intended to dry off the necks and outer scale leaves of the bulbs to prevent the loss of moisture and the attack by decay during storage. Essential steps for curing are heat and good ventilation, preferably with low humidity. This dries out the neck and the two or three outer layers of the bulb. The outermost layer, which may be contaminated with soil, usually falls away easily when the bulbs are cured, exposing the dry under-layer, which should have an attractive appearance. Onions are considered cured when neck is tight and the outer scales are dried until they rustle. This condition is reached when onions have lost 3 to 5% of their weight.

After curing, grading onions can be done manually preferably before storage or taking to market. The thick neck, bolted, doubles, injured, misshaped small bulbs, and decayed bulbs are sorted out. The outer dry scales usually rub off during the grading process, giving the onions a better appearance for market. It has been experienced that if storage is arranged after proper sorting and grading, losses in storage are reduced. For local market, the onions are graded based on their

size: extra-large onion (>6 cm dia.), medium (4-6 cm dia.), and small (2-4 cm dia.) The extra-large onions have great demand and fetches very good price. Generally, the bulbs shall be/have: Reasonably uniform in shape, size colour and pungency of the variety

- mature, solid in feel, reasonably firm with tough clinging skins
- throughout cured and dried
- free from dust and other foreign material
- free from defective, diseased, decayed and damaged bulbs caused by seed stems, moisture, dry sun scald burn, sprouting, Mechanical or other injuries and staining
- free from moulds, soft rot and insect attack
- Less than 20% of seed stem or bolted bulbs onions.

### **3.1.3. Alternative use of onion waste**

Onion wastes have been successfully used in the production of onion vinegar with a two-step fermentation system at research level. It is also possible to produce alcohol for beverages from the onion juice from rejected onions by adding a form of yeast to the juice that decomposes the sugars in the juice into Ethanol (Horiuchi et al, 2000). Onions can be processed into onion oil and powder that can be used as flavor in cooking (Shigyo and Kik, 2008).

## 4. PRODUCTION AND POST-HARVEST PRACTICES

### 4.1. Production

In the last five years, area under onion production has increased. However, productivity has not shown the same trend. Productivity under research varies from 60 to 100 tons per hectare (depend on variety), whereas, the national average yield is as low as 9.3 tons per hectare (CSA; 2017/18). In Mecha woreda, the average yield is about 18 tons per hectare. In Fogera woreda the average yield was about 20.3 tons per hectare during 2013/14-2017/18 production years, which is slightly better than Mecha.

Amongst the producers there are substantial variations in the yields. In spite of the potential, the existing crop productivity has remained low and variable under local conditions. This is due to lack of improved crop varieties, shortage of adapted varieties to different agro-ecological zones, lack of appropriate agronomic packages and the occurrence of diseases. The adoption or rejection of good agricultural practices, such as row planting (which is often not adopted, because farmers consider it too labour intensive), also influences the yields negatively, although an increase in the adaption rate can be seen. The acidity of the soils in the Koga area is a serious constraint to production and can be dealt with by the application of large amounts of lime.

Another factor is the shortage of labour at certain peak periods. In order to overcome this labour shortage, onion growers are using hired labour, using mutual cooperation or a combination of these two. Often farmers cultivate both an improved variety (for commercial purposes) and the local one (shallot). There are indications that farmers are inclined to substitute other crops for onion, in particular in the Koga area.

The following table depicts land allocation, production in hectares and productivity of onion during the years 2013/14 to 2017/18.

Table 1: Onion production in tons and land usage in hectares in Fogera and Mecha woreda

Production year	Fogera			Mecha (only Koga irrigation Command area)					
	Area of land covered in ha	Productivity ton/ha	Total onion production in Fogera in ton	No of Farmers			Area of land covered in ha	Productivity ton/ha	Total onion production in Mecha (KIP) in ton
				M	F	Total			
2017/18	11,881	20.0	2,37,610	9,255	723	9978	648	18.5	259
2016/17	11,854	21	2,48,924	10198	300	10498	936	18.5	17,459
2015/16	10,757	18.5	199,005	1038	541	1579	197	18	3,546
2014/15	9,854	18.5	182,299	910	475	1385	173	17	2,941
2013/14	8,023	16	128,364	489	255	744	93	16.5	1,535

Source: 2016 AgroBIG report, Fogera woreda Office of Agriculture and Koga Irrigation Project

## 4.2. Seed

Quality seed, proper seeding rate and appropriate time of planting are the most important practices for improved onion production. Of the six released varieties of onion, only Bombay Red and Adama Red varieties have been widely adopted in different parts of Ethiopia. Some of the varieties have short maturity periods with high productivity. For instance, Bombay Red has a maturity of 90-110 days while productivity can reach 30-40 tons per ha. The following table shows varieties of onions and productivity including other production features of a selection of improved varieties.

Table 2. Features of improved varieties

Onion cultivar	Maturity (days)	Bulb colour	Bulb shape	Bulb size (g)	Bulb yield (qt / HA)	Seed yield (qt/ HA)
<b>Adama Red</b>	120-135	Dark red	Flat glob	65 - 80	350	10 - 13
<b>Red Creole</b>	130-140	Light red	Thick flatten	60 - 70 70 - 90*	300	2 - 6
<b>Bombay Red</b>	90-110	Light red	Flat glob	70 - 80 85 - 90*	300-400	13 - 20
<b>Melkam</b>	130-142	Red	High glob	85 - 100 70 - 90*	400	11 - 15
<b>Dereselegne / Nasix Red</b>	100-115	Red	Glob	85 - 100	380	-

Source: FAO (2010) in Tadesse Adgo Mihiretu (2008); Desalegn L and Shimeles Aklilu (2003)

There are two methods of onion seed production; seed to seed and bulb to seed methods. Both methods can be used in seed production. The bulb to seed is the most commonly used method in Ethiopia. This method has a number of merits; the option of selecting bulbs of good and uniform size, attractive colour, free from diseases and physical damages. It produces several stalks per bulb hence gives higher seed yield. The method is also good for maintaining the variety identity. However, with this method it takes 10-11½ months to produce seeds, with 4-4½ months required for bulb production and 6-7 months for seed set and maturity. The seed to seed method lacks the above-mentioned merits. It also produces less flower stalk per bulb but takes only 7-8 months to produce seed.

One of the challenges for producers is the lack of seed, in quantity and/ or quality. The Ethiopian Seed Enterprise (ESE), which is the main seed supply organization in the country, is generally not involved in onion seed and bulb production and supply. Most of the demand for onion seed is met by the private sector, cooperatives and other sources for imported seeds. The informal sector plays an important role in the seed supply from Eastern Amhara to farmers in Fogera woreda. Traders supply onion bulbs for seedling purposes, with a selling price up to birr 1,100 per quintal. The quality of this seed does not meet the desired parameters such as germination capacity and genuineness of variety. One of the consequences of this lack of quality is that farmers use more seed than the recommended quantity. According to some farmers, seed obtained from traders is relatively better in quality than seed obtained from local farmers. Getting the seeds supplied by traders on time is often difficult, which may cause delays in planting.

The Agricultural Inputs, Quality Control and Quarantine Authority, is responsible for the certification of seeds including onion. There are also four quality control and quarantine branches (Gonder, Bahir Dar, Dessie and Debre Markos) which can carry out seed certification. The Authority, under the BoA, is responsible for the certification process of the AgroBIG target woredas. According to the BoA, onion seed certification is not yet possible because the source/origin of the seed is unknown. Currently there is no real quality control for onion seeds in



place in Ethiopia. A seed proclamation has been publicized recently, giving broad guidelines for the sector. Specific guidelines, providing details are under preparation.

There are some seed cooperatives in program woreda but as they are dealing with other crop seed multiplication as well still there are shortage of quality seed supply.

To address the onion seed challenges in Fogera and Mecha woredas, AgroBIG has supported onion seed growers so that they can have their products certified by the Quarantine Authority. Labelling, branding and packaging of onion seeds have been carried out after determining its germination rate, purity and moisture content. This was an initiative and early achievement of AgroBIG.

Table 3: Onion seed product in Mecha and Fogera within the last three years (2014-2016)

Production year	Area allocated for onion seed in ha	Amount of onion seed produced in kg	Average price of onion seed birr/kg	Total price in birr/kg
2017/18	114.60	134.00	235	31,490.00
2016/17	18.00	144.00	450.00	6,484,500.00
2015/16	10.00	80.00	500.00	4,000,000.00
2014/15	9.00	75.00	400.00	300,000.00
2013/14	1.75	1,000.00	500.00	480,000.00
2014/2015	22.20	13,130.00	550.00	6,896,500.00
2015/2016	10.62	12,630.00	400.00	5,052,000.00
<b>Total</b>	<b>45.67</b>	<b>26,760.00</b>		<b>12,428,500.00</b>

Source: 2016 AgroBIG report, KIP

Farmers in Fogera have been found to use seeding rates ranging from 1 to 10 kg per ha, which is well above the recommended rate of 3.5-4.0 kg per ha. As the seed supplied by the informal sector does not meet quality seed parameters such as germination rate and trueness of varieties, producers tend to use more seed than is recommended in order to guarantee good seedling emergence. On the average this is 6-8 kg of seed per hectare. Excessive or under-utilization of seed amounts will result in poor plant population and lead to low or reduced yields.

A seed producer using irrigation on average spends approximately birr 12,000 ETB to produce onion seed on a plot size of 50 by 50 meters (1/4 ha). They have three main categories of expenses: labour, agricultural inputs and water pump with its consumables. The cost of water application includes depreciation of the pump, diesel and repair and maintenance cost. Each expense category takes roughly one third of the total production cost. Labour cost constitutes slightly less and the water pump slightly more proportion in the production expenses.

### 4.3. Agronomic practices

#### 4.3.1. Input use

While onion seed production practices are described above, the other inputs required for onion cultivation are briefly explained below.

- **Soil fertility and management:** Most cultivated lands in the Ethiopian highlands are prone to soil acidity due to removal of ample amount of nutrients by leaching, crop mining and runoff. Continuous application of acid forming chemical fertilizers on highly weathered tropical soils increases the soil acidity problem. On the other hand, highly weathered tropical soils have strong P absorption capacities that intensify limitation of land suitability. These cultivated lands require integrated soil fertility management when

they are put under cultivation of economic important crops. Currently, it is estimated that about 40% of the arable lands of Ethiopia are affected by soil acidity (Taye, 2007). About 24% of the Amhara National Regional State is affected by acidity, with large parts of the Region also having been severely eroded. Mecha Woreda is affected by problems of soil acidity with a range of 5-6% acidity level. Soil acidity limits or reduces crop production primarily by impairing root growth by reducing nutrient and water uptake. Moreover, low pH or soil acidity converts available soil nutrients into unavailable forms and acidic soils are poor in their basic cations such as Ca, K, Mg and some micronutrients which are essential to crop growth and development (Wang et. al., 2006). The extent of damage posed by soil acidity varies from place to place depending on several factors including the crop grown. There are occasions where total loss of crops can occur due to soil acidity. Lime application to acidic soils is the obvious solutions to address soil acidity problems in Amhara. A massive campaign launched by the FeDeral Ministry of Agriculture to treat acidic soils with lime resulted in appreciable improvements in the yield of crops like barley and wheat. With the volume of lime required for application to combat the problem, farmers are hesitant to apply the practice.

- Fertilizer: The main fertilizers used for production of onion are Urea and DAP. Usually suppliers of DAP (diammonium phosphate) and Urea are primary cooperatives and farmers have indicated that they can obtain the quantities they require without problems. ATA has recently introduced NPS. Although fertilizers play an important role in increasing productivity of onion, most of farmers do not use fertilizers or use lower quantities than recommended. One reason is the price. Another reason may be that farmers, particularly in Fogera, believe that their land is relatively fertile and therefore there is no need to use fertilizers. When farmers do use fertilizers, the quantities applied vary but often seem to be below the recommended rates in most cases. For this reason, a national soil mapping exercise has been undergoing in the country.
- Chemicals: Due to common pest and disease infestation, no one produces onions without using chemicals, and hence the use of pesticides is wide spread. Most used chemicals are Celecrone and Ridomil. In Ethiopia there is not yet a reliable, professional distribution network for agro-chemicals. Also, there is no real control on the genuineness and quality of the products sold. Even if the products are genuine, due to improper storage, handling, transport they may lose their quality. Pesticides are mostly supplied by private vendors. Some of these vendors as well as extension workers provide advice on the application of these chemicals. The importance of an adequate disposal of the empty containers seems to be understood but no real proof of this has been shown. Formal guidelines for this disposal are non-existing. There have been serious incidents with mishandling of chemicals. Traders do not always know what they are selling, farmers do not apply correct dosages etc. AgroBIG has introduced sprayer groups with trained members to provide professional formal spraying services to farmers that at the same time creates employment opportunity for youth.
  - Production tools: Traditional hand tools like shovels, spades, hoes etc. are commonly used by smallholder farmers in the two woredas. Oxen pulling traditional ploughs and hand ploughs are used to plough and prepare the land. Harvesting is mainly done manually. Application of protective measures for harvested produce from the sun is almost non-existent (resulting in reduction of quality).
  - Water pumps: Water pumps are vital farm inputs for the onion growers in the two woredas. Most of water pumps are owned by individuals. Generally, two to three farmers form a group and purchase a water pump with a loan. The group members' watering schedule priority is done with agreement. If none of the members of the group is using the water pump, they may rent it to others. At present the average rent of a water pump is birr 10/hour. Due to poor quality of the pumps and lack of maintenance and repair, the

economic life of pumps is very limited and has been found to be as low as 4 years. AgroBIG has provided 76 water pumps to cooperatives in Fogera, who rent them to farmers for 10 birr/hour plus fuel, in addition to having organized motor maintenance groups to prolong the life span of the pumps.

#### **4.3.2. Agronomic practices**

Most farmers are smallholders who cultivate onions both under rain-feed conditions as well as under irrigation. They cultivate small and fragmented plots of land on which they produce different crops including onion. As onions cannot be replanted sequentially on the same plot, rotation of crops is practiced. Major agronomic practices are conducted in the following ways:

- Soil preparation: Farmers prepare the land for planting using oxen plowing.
- Planting time/calendar: Onions are planted mainly where there is reliable irrigation access in areas where there is no purple blotch problem. Onion can be planted in the rainy season with strong pest and disease management.
- Weed and disease management: Onions are susceptible to weeds and the fields should be free of influence of weeds during the first 60 days (especially during days 21-60). Disease is a significant problem in onion production. The most common diseases of onion are Purple Blotch and Downy Mildew that are particularly severe during the rainy season and under moist conditions. To prevent occurrence of such diseases, cropping in the appropriate season and following traditional methods that prevent the disease are some of the first step measures. Crop rotation with non-related crops will help reduce the building of pests.
- Post-harvest handling: An Agronomic and Post Harvesting Manual has been prepared by AgroBIG to improve the practice in the areas.

#### **4.4. Water requirements/irrigation**

The amount and frequency of irrigation depends on the soil type, climatic condition and stage of the seedlings in the field. Seedlings should be watered slightly immediately after transplanting. After this, the seedlings should be watered every 4-5 days for the first one month. After that, it should be irrigated every 5-7 days until maturity. The crop should not be over irrigated or deprived of water as both affect productivity. In Fogera woreda farmers use motorized water pumps to irrigate their crops including onion. Some kebeles, like Bebeke, benefit from river diversions that have been established. In Mecha, farmers in the Koga Dam area rely on the irrigation system put in place. Outside the command area, farmers do use pumps, wells and river diversions. There are operational and maintenance problems to make wise use of the water. Shallow wells are another source of irrigation water in Fogera district. Drilling a well in Fogera costs 20-25,000 Birr. AgroBIG has promoted manual well drilling techniques and water pump maintenance.

#### **4.5. Harvesting**

Before harvest onion, it must complete its physiological maturity and hence farmers and extension agents should strictly obey it. Accordingly, harvesting usually takes place when 80% of the onion plants have soft necks or dry, which occurs at a time when about 80% of the shoot weight is in the bulb and the foliage is starting to collapse or fallen over. As onions mature, their dry matter content and pungency increase, and subsequently the storability potential increase. Harvesting onions should be done when the weather is dry; harvesting after a rainfall, or when the humidity is high, increases susceptibility to post-harvest diseases. At harvest, bulbs must be firm, with mature (closed) necks and scales, and must be in good size. Defective onions (i.e. sprouted, insect damaged, sun scalded, green, bruised) should be discarded. The outer scales

should not be removed.

To harvest well matured and relatively dry onion watering needs to be avoided at least two weeks before harvesting, but farmers keeps watering for ease of harvesting. This will affect the quality of onions negatively. Awareness have been created by AgroBIG resulting in farmers having stopped watering just before harvesting to increase the weight of the crops which also increases shelf life. As uprooting is difficult if the soil is hard, this needs some balancing.

To harvest onion

- Loosen the soil around the bulbs to encourage drying,
- When tops are brown dug out the bulb, but do not use sharp material that can injure onion,
- After harvest, lay harvested onion in rows so that the leaves in the row protect the next bulb from sunburn,
- Clip the roots and cut the tops back to 1 inch after foliage get dried ,
- Let the onions cure on dry ground for a few days, if weather permitting.
- Always handle them very carefully—the slightest bruise will encourage rot to set in,

#### **4.6. Curing**

Curing is the process of removing moisture from necks, roots and the outer scale tissues to prevent the loss of moisture and the attack by decay during storage. For optimum storage quality, onions must be cured soon after harvest by placing them on dry ground for a few days. However, if rain occurs, the bulbs should be brought immediately to the curing house. i.e. in a drying room or shade. At this stage, the nutrient from the leaves move into the bulb until the foliage is dead and the neck gets soft and sealed. This gives the maximum opportunity for the growth inhibitors present in the leaves to enter the bulb and improve its storability or shelf life. Such curing practices improve yield and quality in terms of skin color and its retention. The essentials for curing are heat and good ventilation, preferably with low humidity. Onions are considered cured when neck is tight and the outer scales are dried until they rustle and onions have lost 3 to 5% of their weight.

Similarly, drying onions until it seals the neck helps to prevent microbial infection, reduces water loss during storage, and is desirable for development of good bright crack-free skin or scale colour.

#### **4.7. Post-Harvest Handling**

Almost none of the farmers apply post-harvest techniques to improve the marketability of their crop. Most producers sell their harvest to traders at the farm gate immediately after harvest. As the farmers sell different sizes (and sometimes even different varieties) mixed together, they will get a low price. Sorting, grading, storing, transportation, loading and unloading is usually done by middle men and traders. Farmers do not seem to be keen on grading as their experience is that they will then be unable to sell the smaller size onions. Traders and brokers may be reluctant to buy graded onions as they lack the trust that the farmers will not try to cheat. The sorting and grading, if done, is mainly based on external aspects of the product like colour, size, ripeness and firmness.

Onion passes through many hands from the time it leaves the farm until it arrives with the consumers. Due to improper handling and packaging, onions often suffer Mechanical damage during transport which shortens the shelf-life considerably. It is estimated that up to 30% of post-harvest losses may be due to improper storage, handling and transportation. Some farmers actually dry their onions, simply by hanging them in the air in their houses. However, this method

of storage handles small quantity of onion, but they are able to supply good quality dry onion to market at high price. Therefore, this method should be encouraged and be adopted by as many farmers as possible. As the onions become dry, the shelf life increases. Grading has not been conducted properly; brokers or collectors undertake sorting using daily laborers. Farmers usually do not conduct sorting in order to avoid weight loss. AgroBIG has established collection centres to enable cooperatives so as to engage in collective marketing. Crates, made of plastic, were also provided in order to reduce damages during handling and transport.

#### 4.7.1. Storage

Proper storage of bulbs is necessary both for consumption and also for seed production. Onions should not be stored unless adequately dried either in the field or by artificial means. It is necessary to dry the neck tissue and outer scales until they rustle; otherwise the bulbs will rot in storage. However, generally in Ethiopia because of lack of proper onion storage facilities, all produce is marketed immediately after harvesting, which results in a reduction of the price due to the high supply at harvest time. Apart from the lack of storage, there may be other reasons for selling the produce immediately, like an urgent need of cash. Lack of stores is a big problem that forces farmers to sell soon after harvest, when prices are low. Cooperatives as well as farmers lack storage facilities. Dessalegn and Aklilu (2003) reported that there are traditional storage practices such as hanging from ceilings, storage in burlap sacks, drying on open floor that are used to extend the shelf life of the dry bulbs. The condition of cultivars, the quality of bulbs, field management and handling practices are important factors influencing storability. It is important to develop less costly and ventilated storage facilities applicable to small-scale farmers. Simple ventilated storage constructed from poles, wire meshes and sheets of grass roofing found effective in extending the shelf life of onion in the rift valley. Such simple ventilated shade could be constructed from any locally available materials such as bamboo, grasses, small poles etc and be effectively used for small and bulk storage (Figure 1) in the project woredas. Ventilated structure also minimizes losses and maximize storage period which could be achieved by orienting the store to the prevailing wind and sometimes by hanging bunches and stacking the bulbs on wooden/mesh shelves with sufficient air space. This will reduce losses, which is commonly caused by rotting, rooting, and sprouting and weight loss. Such storage practices are important to extend the market and processing season beyond the season of production. Under Melkassa conditions, properly cured onion bulbs could be stored for 2-3 months. It is important to note that, onion is less sensitive to perishability compared to the many vegetable crops produced in the country.

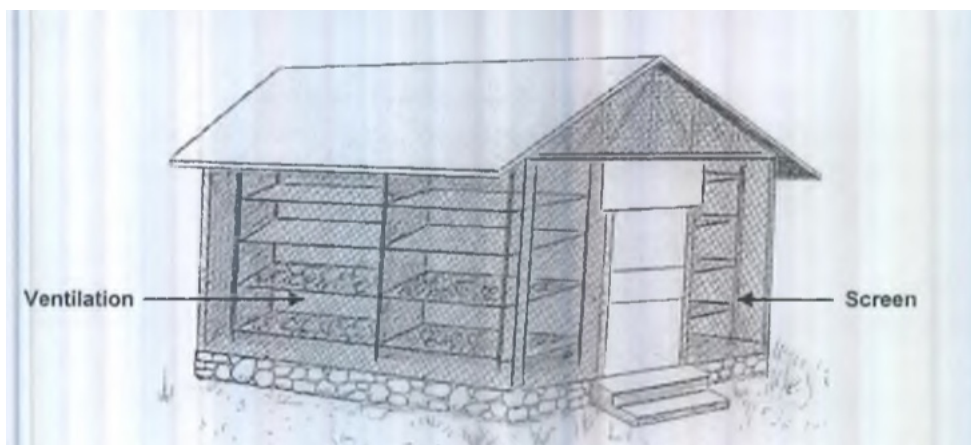


Figure 1. Simple ventilated shade for onion storage

#### **4.7.2. Shelf life**

Different varieties have different shelf life. However, this can be influenced with proper handling. Farmers generally do not cure or treat onions to increase the shelf life. Freshly harvested onion bulbs have open wounds at the neck where the green foliage was cut from the bulb, wounds that cause the onions to decay quickly once they have been bagged for transport. Some onions will then sprout after few days. Others might become infected by various decay-causing organisms, which quickly cause the inside of the onion to rot and make it unfit for sale. Due to this and the general lack of proper storage facilities, farmers have a short period of time to get their crop to the market. They are, therefore, much susceptible to price fluctuations on the market as they cannot wait until the price has reached a satisfactory level.

#### **4.7.3. Packaging**

Onions are usually collected in polyethylene sacks of various sizes that the brokers or traders provide. Bags made of jute are also used although this is not a common practice. Good packing material for onions must meet the following criteria: (a) Strong enough to retain the weight of onions under the conditions of transport and storage. (b) Allow sufficient ventilation for the air around the bulbs to circulate to maintain relative humidity. (c) To display legally required and commercially necessary information. These practices are usually not followed in the region and at the country level. Unless proper weighing and packaging take place, farmers might loose on the payment due to an underestimated weight. AgroBIG has put in weighing scales to improve the practice and enable farmers to get a fair price based on the correct weight of their produce.

#### **4.7.4. Transport**

Transport is a problem for many farmers. However, some use donkeys or even mule drawn carts to reach markets. Animal drawn cart made for such purposes is not common in the project woredas. Farmers should be supported to adopt such simple transport system so that they can have better market access for onion and other harvests. A very common way to transport fresh produce is with ISUZU trucks, but there is a big challenge during rainy season as the Lorries or ISUZUs can't enter into most PAs and they need availability of the harvest to their full capacity. Currently, the private traders or brokers buy the produces directly from the farmer's field at whatever price they fix. They distribute it in the local market in polyethylene bag or spread on open truck i.e. without sacks or crates and then cover with plastic sheet. Loading and unloading come at a cost. Brokers organize the transfer of the product to warehouses of traders. The brokers get a commission of birr 20/quintal of onion for their service.

## **5. MARKETING**

The result of rapid market survey conducted in July 2018 by study team in AgroBIG program woredas shows most small holder producers do not try to study their market at all. They continue to produce the same crops that their neighbors grow and compete in the market for the same product. Some farmers even do not know and talk to their customers, but only sell their products through middlemen. No one does a sort of market assessment or even do not consult experts that could guide them what and how to produce to get better market and better income.

Rapid market survey helps us realize just how market information is valuable to the right decision making on production, marketing and to create market linkage for producers. Therefore, this market survey was conducted to study the existing marketing system, marketing channels, buyer's requirement, identify marketing constraints and finally to pinpoint possible interventions to improve the situation.

## 5.1. Demand and supply situations

### 5.1.1. Supply

As indicated in the Figure 2 and 3 below, onion production and supply increased significantly in the last five years in both programme woredas and at national level. This may be a direct result of the various interventions initiated and put in place by AgroBIG in the project woredas. On the other hand, the increase in production and productivity at national may create strong competition ground to sell products. Under this situation, growers should focus on market-oriented production with utmost quality.

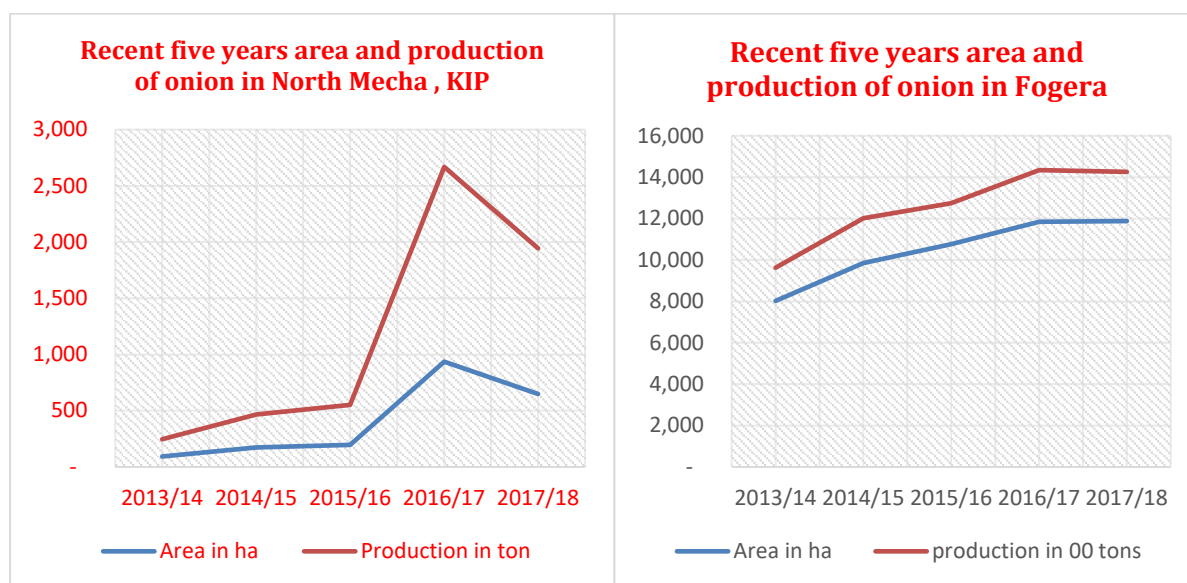


Figure 2. Onion production trends in Fogera and Mecha (2013/14 – 2017/18)

Source: KIP and Fogera woreda Office of Agriculture (irrigation department)

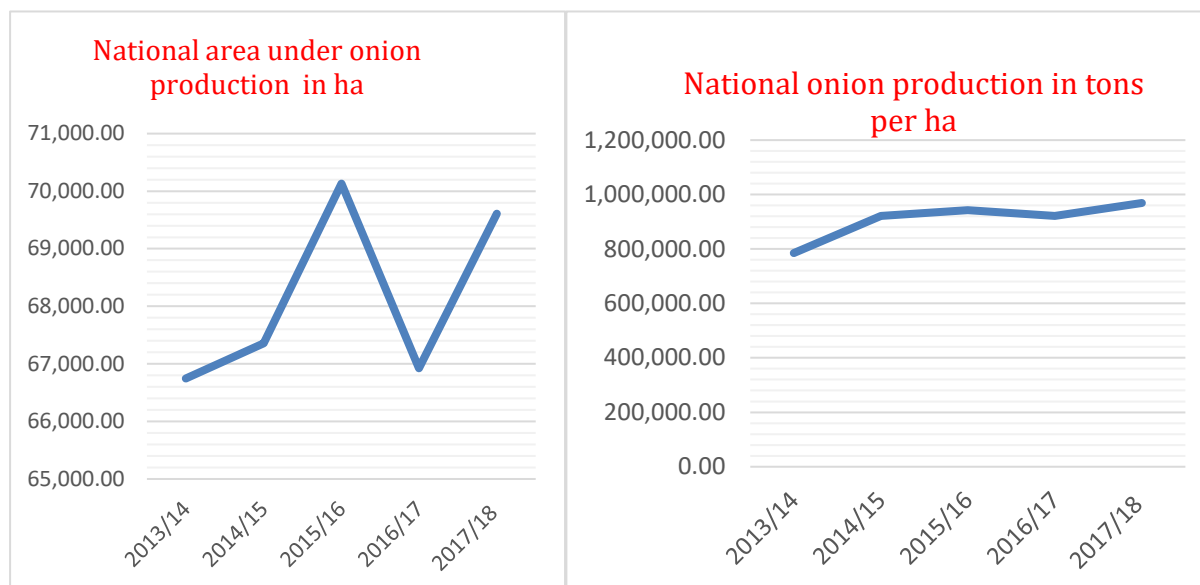


Figure 3. National onion production and area coverage from 2013/14 to 2017/18

Source: CSA 2013/14 – 2017/18)

Looking at the total production of onions in the 2014-15 season of about 23,500 tons (235,000 quintal) for both woredas, this would be far from the estimated total demand in Amhara Region, with over 20,000,000 inhabitants. Extrapolated demand based on the per capita consumption (which is 6.2 kg per person per year), the demand for the region would be 124,000 tons, 10-fold higher than the current production level. In fact, there is high production of onions in Eastern Amhara as well as export from the region and import from the Sudan. In the rainy season there is often a shortage of onion on the market in Bahir Dar.

Despite high demand for vegetables in major towns, the majority of small farmers are unable to reach those markets and sell their products at the farm-gate to brokers. Only a few producers transport their products directly to potential buyers at the market in district towns. Key constraints faced by farmers with regard to marketing are:

- Limited access to market information service that the farmer can rely on or make him confident to decide. Of course, AgroBIG has put in place a sophisticated Market Information System with BoT that provides price information in Amhara Region, free of charge, by dialing 8096 or SMS on 8092. ATA is also operating a parallel system. The market information service at Fogera is better than other woredas, and hence other should learn a lesson from them.
- Limited market linkage facilitation to big buyers or big market,
- Absence of processors and out growers that can buy onion on contractual base,
- Limited number of potential big buyers and even the existing buyers are also not willing to make contractual agreement with farmers,
- Lack of access to transport to move their produce to more distant markets;
- Dependency on brokers, caused by the two above factors
- Farmers are not organized and operate individually, which makes it difficult to meet the requirements buyers requiring big volumes.
- Farmers operating individually lack the power to negotiate successfully for good prices and conditions, something that calls or farmers to come together

### **5.1.2. Demand**

According to 2018 market survey, both area under onion production and total production nationally as well as in program woredas depicted an increasing trend. Similarly farm gate price both in North Mecha and Fogera woreda shows an increasing trend. From this one can conclude that the demand for onion has been continuously increasing. So, there is a good opportunity for regional and national onion producers.

Some of the characteristics of onion market in Ethiopia at national as well as in ANRS include:

- Demand for onion is growing with growing population and urbanization,
- During off season the local onion supply decreases, whereas demand increases. Accordingly, during main rainy most farmers grow cereal crops, as a result onion demand will increase and to fill this demand and supply gap traders will buy onion from other zones in the region or from other region and some traders import Sudan onion during this period.
- Usually, it is said that high income groups prefer better quality at relatively higher price and lower income groups prefer relatively lower quality. But price difference due to quality or grading is not common in the project areas since grading is not properly practiced and due to absence of obligatory quality standards.
- The demand for onion is constant throughout the year, but with slight increase during holydays and decrease when price goes up.



- The demand for onion in urban area is higher than rural area,

## **5.2. Quality requirements**

According to most respondents during the survey (July 2018), consumer preference for onion depends on type of onion, bulb size, color, dryness, and free from fungus, germinated bulb, rot and bruises. Some consumers prefer the local variety (*Allium cepa* L. *Aggregatum* group) for its strong pungency irrespective of its small bulb size. Whereas, other prefer improved varieties with medium to large bulb size for its ease of processing at home and restaurants. On the other hand, producers prefer improved variety because of higher yield due its large bulb size. Long shelf life which is directly or indirectly related to physiological maturity before harvest, harvesting technique, post-harvest handling and storage is another preferred attribute that reduces losses during storage for consumers, traders and producers. Other criteria are pest resistance, draught resistance, ease of cooking, good food quality etc. Onion kept or stored in polyethylene will create heat and moisture that leads to the development of fungus and then facilitate rotting.

Although there are officially approved national standards for fruits and vegetables in the country, they are hardly used or implemented. At present there is limited capacity to reinforce the existing standards throughout the country, because the existing national standard for fruit and vegetable is not obligatory standard. The other issue is that neither producers nor consumers seem to insist on standards. As long as farmers produce for national markets standardization may not be a critical issue. However, in order to meet the standards of international markets, the application of specific standards would be a strict requirement.

## **5.3. Marketing Channel and market segment Analysis**

### **5.3.1. Market segment and marketing channel analysis:**

Market Segmentation analysis identifies and analyzes different groups of consumers within a market. Accordingly, onion market is characterized by high to middle income markets, low to middle income markets and institutional buyers based on economic status, demand for quality and volume of purchase at a time. Additionally, geographical segmentation was noticed according to respondents during market survey. Low to middle income group looks mainly for chip price whereas high-income group and institutional buyers mainly focus on quality and sustainable supply. Onions are sold only for fresh use market as there are no processors yet. Figure 4 below shows the marketing channels (drown based on survey result) showing how it reaches from producers to consumers.

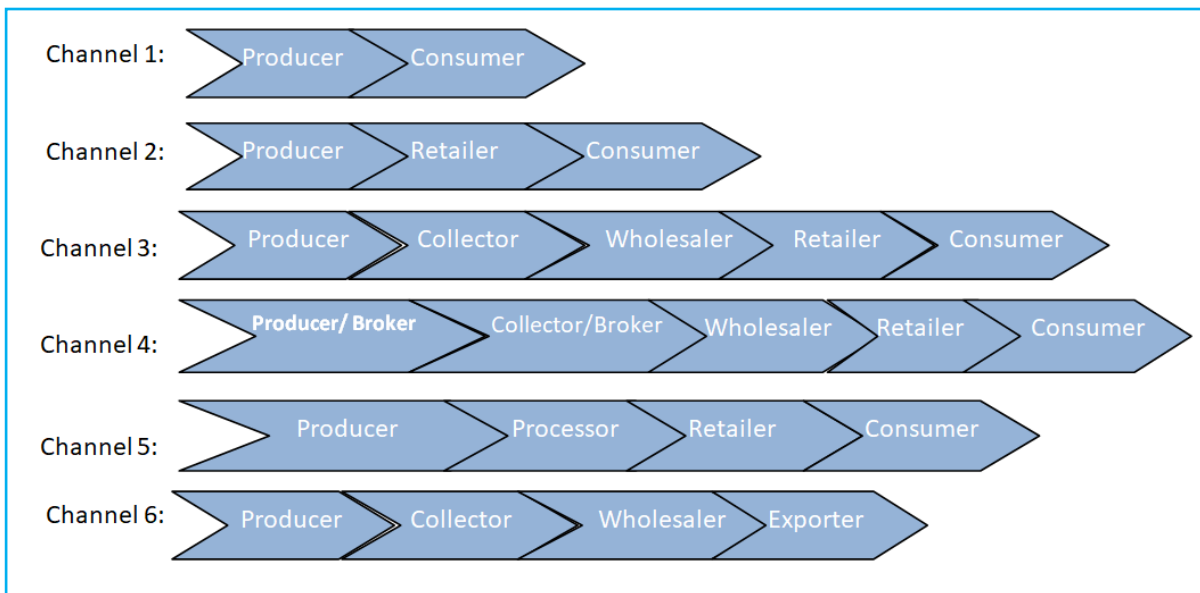


Figure 4. Onion marketing channels

A Market Channel Analysis assesses how a market channel operates. It records all firms involved in a market channel from production to final consumer demand. Firms carrying out similar functions are grouped together, and data on number and size of firms and prices of product that flow in and out is recorded. Lastly, there is an analysis of how the product(s) flow through market channel in order to determine opportunities and constraints.

The study indicated that onions marketing in the AgroBIG program woredas seems a bit complex as there is in-flow product from other areas (Sudan, Shewe Robit, Adama, Wolo, etc) and out-flow of product from programme woredas to other markets. However, when we focus on onion produced in AgroBIG program woredas it passes through number of actors following different channels before it reaches the final consumers.

The major marketing channels of each woreda is nearly similar. The market channels indicate the flow of produce from producer to consumer and also indicates the market size for the given product. Accordingly, out of total onion produced only 10-15% produce can be sold by farmers directly to consumers and those farmers that are able sell directly to consumer are getting better margin. The direct sell from farmers to consumers mostly take place at Marawi, Fogera, and Dera woredas open market. Still it will take place in Bahir Dar city in very small amount, due to lack of free open market most farmers are un able to participate in this direct sell to get advantage price that consumers are paying. However, if open market place is organized at Bahir Dar Zuria, Merawi, Dera and even Fogera woreda farmers will get access to Bahir Dar market. Similarly, about 10-15% onion will be sold directly to local retailers by farmers. The majority of produce which is 70-80% will be sold through collector or broker to wholesalers. As the number of actors between producers and consumers increase profit margin of producer will decrease. However, market size for shorter channels is small and can't absorb all onion produced due to lack of modern market infrastructure. So, while trying to facilitate market linkage the amount of produce and market size should be considered. Similarly, retail sell is time consuming for producers especially for those who are having more produce and those who are having something to be done on farm. However, farmers can use holydays to retail sell. Onion export is also included in market channel, but most of onion exported from Ethiopia comes from areas other than the program woredas.

### 5.3.2. Domestic market segments:

- **Low to middle income markets:** It is estimated that the vast majority or over 85% of the Ethiopian market falls within this category. This segment consists mainly of individual

consumers with limited purchasing power. Individuals buy onion for home consumption. Most of the time, they buy small amounts of onion from local retailers. Purchases are usually made in open air markets. These market outlets are anticipated to continue to grow quickly with the population increase and higher buying power.

- High to middle income markets: This end market is the smaller of the two, estimated that it comprises about 15% of the population. The segment of high to middle income markets, mainly located in supermarkets, where onions sometimes are pre-packed in small bags, is concerned with quality as much as prices. Consumers with middle to high incomes are concerned with a good quality and are prepared to pay a higher price for that.
- Institutional buyers: The market for high to middle incomes consumers consists of big hotels, restaurants and cafes. Institutional buyers like universities, hospitals and prisons set specific quality specifications and requirements like timely and year-round delivery. For individual farmers as well as primary cooperative it is hardly possible to guarantee such regular, sustainable or year-round supply. However, Primary cooperatives can solve this problem by coming together and forming one very strong union having truck, pack house and well facilitated store and then collect produce of member's primary cooperative by regulating quality strictly during production season. On other hand, once contractual agreement is made for year-round supply the union should be able to buy quality onion from any other places during off season and then supply sustainably.
- Contractual market linkages created: AgroBIG has facilitated contractual marketing between onion and potato producer cooperatives in both woredas with ETfruit, which resulted in 1474 quintals of onion delivered to ETfruit in 2015. This agreement has brought significant impact to make the marketing system more efficient as irrigation cooperatives can sell their produce directly to the buyer at market prices. This has prevented illegal brokers from disturbing the market as they had done in the past. As a result, market prices became relatively more stable, attractive for 3-4 months, and enable the producers to earn a better income from the selling of onion. ETfruit, however, said in the current study that farmers demand high price, to compensate low productivity by high price.

### **5.3.3. Export market**

Ethiopia has been an exporter of onions in the past 10 years. The export has mainly been to Djibouti with small amounts going to Somalia. In the past five years on the average export and import volumes were 10,912 and 9,987 tons, respectively (Figure 6). The import has been coming from the Sudan, through Metema and retailed at Bahir Dar and Addis Ababa. The price of the Sudanese onion has been quite competitive with the local produce. In addition, its size is big and has longer shelf life than most domestic products. Ethiopia is still unable to export onions to the larger international market as the quality requirements cannot be met. The neighboring countries, however, do not have such stringent quality requirements.

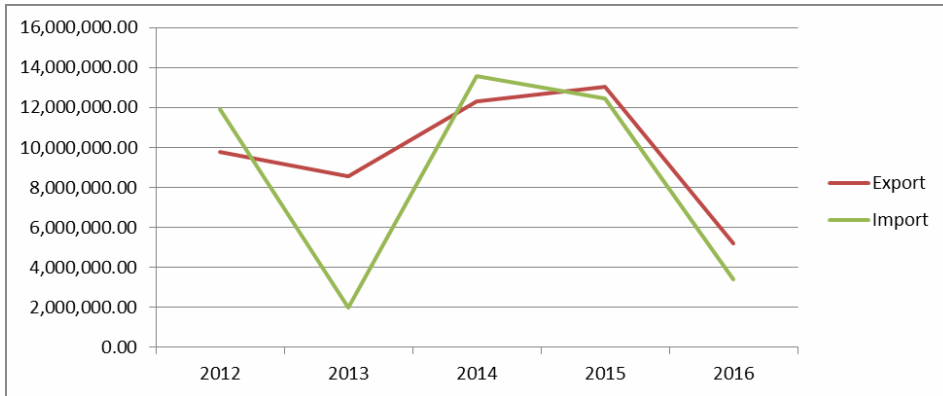


Figure 5: Ethiopia's imports and exports from 2012 to 2016 (Net weight in Kg)

Source: Ethiopian Revenue and Customs Authority (2012-2016)

### 6.3.5. Price fluctuations

During the peak market, the farm gate price of onion will go down significantly. Over the last five years the price of onion has shown an upward trend, except 2016/17 that shows decreasing trend (Figure 6).

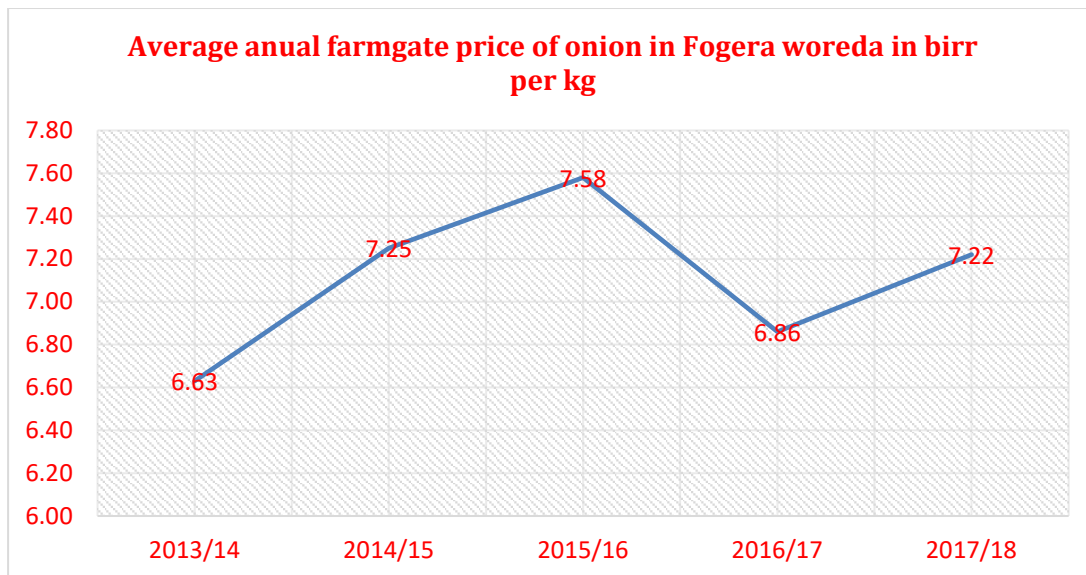


Figure 6. Farm gate price for local red onion and Bombay red at Fogera

Source: Fogera Woreda office of Trade

It is difficult to say whether this increase in price is because of the inflation rate or not. Price differences across seasons are explained mainly by demand and supply. However, price differences within the same season can also be observed.

### 5.3.6. Challenges in marketing linkages

- Farmer's behaviors in pre-harvest management of the crop i.e. adding water with the aim of softening the soil for harvesting create quality problem. Traders said this practice helps the farmers to increase the weight of the product. Hence, collectors and traders even within the woredas (especially in Mecha) do not want to buy the harvest from their own

region due to quality problem. The shelf life of onion from Mecha is not more than a week according to traders and consumers. Consumers said the stew prepared using onion from the region will get spoiled within a day. This has created a problem in marketing.

- The average productivity of onion is 16.5 – 18.5 t/ha; it is very low as compared to research result that goes 30 – 40 t/ha. This low productivity has forced farmers to claim higher selling price. This is one of the reasons why some buyers like EtFruit could not collect from producers in the project woredas.
- Due to Lack of cropping schedule all farmers grow the same crop at the same time and they almost supply to market at the same time. This reduce the market price at that specific time.
- Quality is one of crucial element to compete in market, however onion produced in North Mecha, Fogera, Dera, and Bahir Dar Zuria is inferior in quality as compared to Onion from Shewa Robit, Nazrit (Adama), Wonji , Wolo and Sudan. As a result, it was noticed that almost all program woredas supply poor quality product due to poor crop management, harvesting technique, curing and post-harvest handling.
- Poor market linkage facilitation by implementing partners to link producers to big buyers and market. The collaboration between institution that are responsible for market linkage is not strong, for instant trade, industry and marketing office and cooperative promotion office is not strong to facilitate market linkage for primary cooperatives.
- Lack of reliable and timely market information service delivery to producers; due to this farmer only get distorted market information from each other, collectors and brokers that make their bargaining capacity very weak, except in Fogera woreda, that provide better market information at PA level in collaboration with regional BoT that was supported and capacitated by AgroBIG . In this regard Fogera woreda experience should be shared to other woredas.
- There is an entry barrier for farmers to sell their produce in Bahir Dar vegetable market place as it was only allowed for licensed traders, and also due to lack of organized free open market place for farmer's produce.
- Lack of store and retail shop for vegetable farmers primary cooperative cooperatives and Koga Union in Merawi, Woreta, Bahir Dar and Gondar
- Limited number of big buyers (collectors or assemblers) or even absence of any license collector (South Mecha and Bahir Dar Zuria).
- Shortage of labour during peak season or during agricultural practices that demand more labor

## 6. VALUE CHAIN ANALYSIS

### 6.1. Actors of the value chain

Prevailing value chain actors' relationship and product flow has been indicated in Figure 7.

#### 6.1.1. Producers

Farmers are key primary actor in the onion value chain. They produce it mainly for market purpose.

Bulking and trading

- **Primary Cooperatives and Union:** In all program woredas, several primary cooperatives were organized by woreda cooperative promotion office, but they are not yet organized as unions except in North Mecha. And all organized cooperatives are not active in bulking

or assembling farmers produce and marketing. So, there is a need to organize farmers as cooperative in all woredas other than North Mech, and then to capacitate both by improving their marketing skill and creating market linkage for them.

### **6.1.2. Collectors or assemblers**

Two type of collectors or assemblers were interviewed in July 2018, some collectors are farmers that are producing onion but also involve in onion and other vegetable trading. Others are traders that are engaged in vegetable trade including onion. Collectors buy onion from farmers following two type of modality: directly buying from farmers without broker or through broker. Some collectors are also brokers. Most collectors buy onion from farmers on cash basis, but often sell on credit and sometimes cash to wholesalers. It is risky for collectors that wholesalers may delay the payment or even deny at all. In addition, some Wholesalers also reduce the agreed price after they have received the onion by saying the quality of onion received is of low quality. This situation sometimes have an influence on the collection activity; and vegetable trade looks risky business as the transaction will take place without any prior legal agreement and document that give legal ground on the transaction process. This should be improved by the government by introducing a receipt system on the transaction. Unfortunately, traders may also agree on this because they want to conceal the transaction volume to evade taxation. Due to lack of such control and documentation system, on vegetable transaction, it is hardly possible to estimate the exact volume coming into and going out of the region on daily basis. Those collectors who worked as a commission agent (like that of brokers) provide the collection service for wholesalers or traders without involving in the financial transaction and earn 20 birr/quintal for their market linkage creation.

### **6.1.3. Brokers /middlemen**

Most brokers play the role of assemblers and middlemen. Sometimes they buy onion from producers at farm gate, harvest and then transport to other areas. On the other hand, they also play the role of middlemen. Often, there is clear distinction amongst brokers and rural collectors.

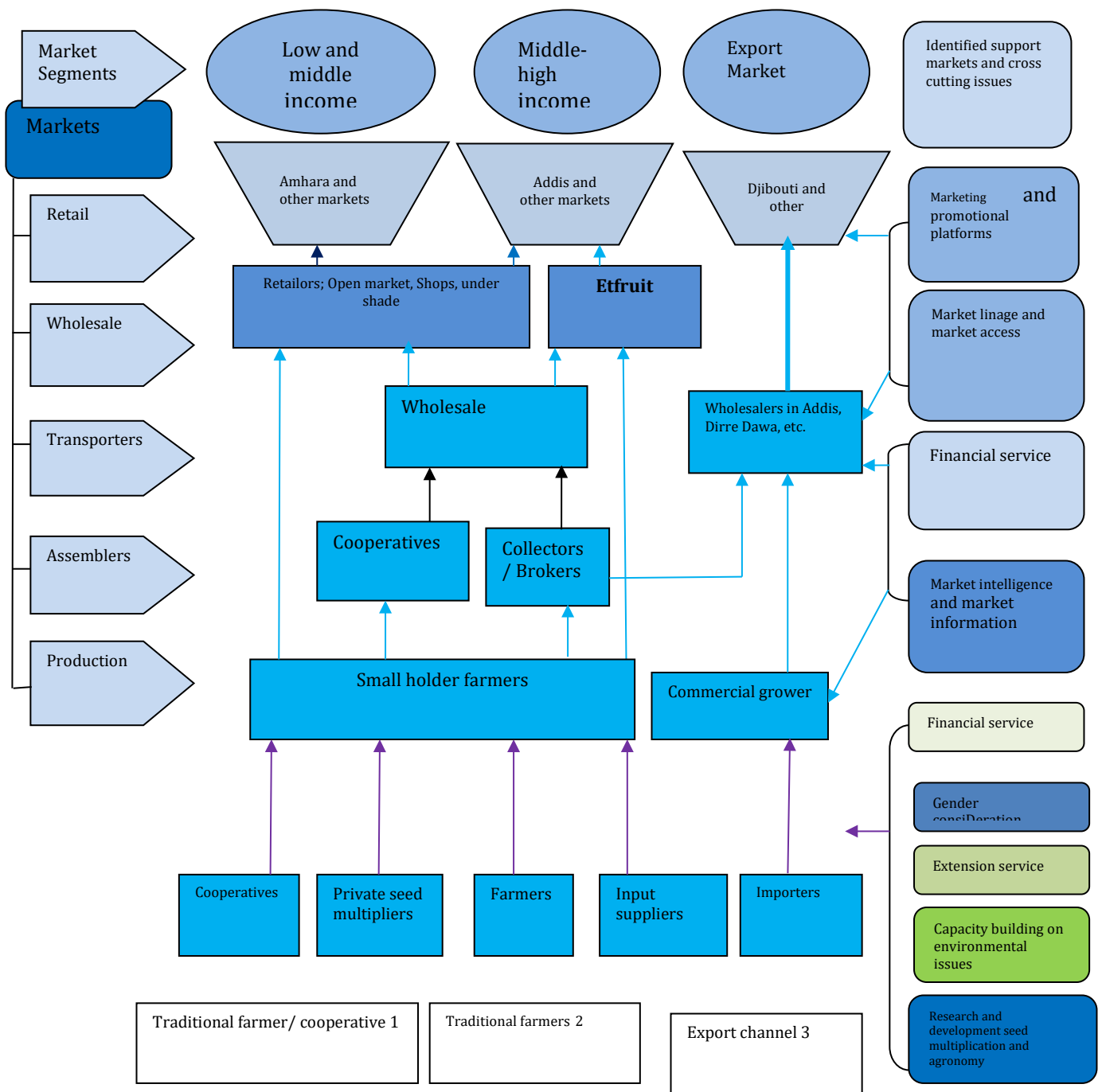


Figure 7. Relationship between actors of onion value chain

#### **6.1.4. Wholesalers**

Most wholesalers located at Bahir Dar are sourcing the product from the project woredas and also from other regions such as Wollo, Shewa Robit, Adama, Arsi Sire, etc depending on the season of productions and market situations. They sell to retailers at Bahir Dar or transport the product to long distance markets. Onion from most of the project woredas are less preferred than products obtained from Shewa Robit and the Sudanese onion. The wholesalers in the value chain buy onion with or without brokers by paying cash on hand or transferring through bank. They then sell the onion received from the brokers to different customers at their point of sale.

#### **6.1.5. Retailers**

These traders buy an average of 5-20 quintals on market days. They have fixed places in markets that they pay for and from where they sell to consumers. Most retailers located outside of Bahir Dar buy onion both from (a) producer at woreda open market place (b) at farm gate, and (c) wholesalers. For instance, retailers located in Dera buy onion only from producers. Retailers located Merawi and Woreta buy both from farmers and wholesalers. However, most retailers based in Bahir Dar City buy onion from known source (main wholesalers); are not willing to buy from farmers due to fear of low quality (sprouting and short shelf life). The retailers' sells volume vary depending on the market. Those who are located at Bahir Dar and Dera woreda/ Gumara kebele sell more volume than those located in other towns because of the population size and access to travelers, respectively.

#### **6.1.6. Processors**

In Ethiopia hardly any processing facilities exist for onion. However, there are ongoing experiments and tests for drying onion by using solar energy at ARARI. Dehydration (drying, powdering, onion rings) is a well-known practice in other countries but not practiced in Ethiopia. A crucial issue regarding any processing is marketability of the processed product. Even if a methodology like drying is going to give good result, the successful implementation will depend on consumer acceptance of the new product.

#### **6.1.7. Exporters**

Onion exporters mainly are based in Dire Dawa and they export majorly onion produced in East and West Hararghe. However, when there is supply shortage they will buy for East Shewa. Additionally, in a very small amount, ETfruit (state-owned enterprise) exports onion. Major export destination of onion are Djibouti and Somalia. However, they have a chance to export to Eritrea and Middle East by improving cropping schedule, production, productivity and quality of onion, to supply quality onion in a sustainable manner to become competent in the market.

### **6.2. Profit Margin**

The findings showed that the highest profit margin is obtained by producers and retailers followed wholesalers and collectors (Table 4). Due to the transaction volume, however, the income of retailers is very small when compared to other actors. The maximum operational cost is incurred by wholesalers followed by collectors.



Table 4. Margin analysis for main actors of the value chain

	<b>Producers</b>	<b>Collector</b>	<b>Wholesalers</b>	<b>Retailers</b>
Purchase/Production cost per quintal (a)	397	550	650	900
marketing cost per quintal (b)	65	50	165	30
sell price per quintal (c)	550	650	850	1,000
profit margin per quintal (d)	88	50	35	70
Margin (%):	36%	21%	14%	29%

### 6.3. Service Providers

#### 6.3.1. Extension services

**Woreda offices of Agriculture:** The Woreda offices of Agriculture (WoA) provide various advisory and practical services to farmers producing onion. The office encourages farmers to sow onion in rows, application of furrow irrigation, and follow up the use of recommended level of input packages.

**BoT & Wreda office of trade:** These two offices are supporting and facilitating market linkages and market information provision. The following services are rendered by the offices; (i) strengthening of market linkages; (ii) disseminating market information, (market price information collection on a weekly basis (Wednesday and Saturday) and reported to the respective zonal office every Monday where the average price information is posted on information boards; (iii) creating conducive market condition for traders (e.g. map prepared to cluster perishable product traders under market shade in Merawi and Woreta towns).

**FTC and ATVETs:** The Agricultural Technical and Vocational Education and Training Centres (ATVET) have been established in order to upgrade the skills of the Development Agents (DA) and (agricultural) Subject Matter Specialists. The Farmer Training Centres (FTC) are, as the name indicates, training centres for farmers, although not all of them are at the required standard. They do lack facilities, demonstration areas, and extension materials. AgroBIG has supported the construction of model FTCs that include a 2.5 ha demonstration area directly linked to the FTC.

**Kebele Agricultural Experts (KAEs):** The selected woredas have 3 KAEs per kebele, one specialized in agronomy/horticulture, one in livestock and one in Natural Resources Management (NRM). Most of the KAEs are generalists and did not receive specific training in particular crops like onion. The DAs provide extension services in the field (mostly one on one).

#### **Cooperative Promotion Agency**

The Cooperative Promotion Agency (CPA) provides the following major services to cooperatives: provision of legal certificates to cooperatives, financial services, provision of audit services to cooperatives, create awareness among members of cooperatives and the larger community regarding the benefits of cooperatives to solve socio-economic challenges, facilitation of the distribution of dividend (if any) among cooperative members, provision of training on bookkeeping, management and leadership, good governance etc. They lack, however, capacity in managing business organizations.

### **6.3.2. Financial services**

Inadequate access to financial services is one of the major bottlenecks in rural areas. Microfinance institutions (MFIs) and rural savings and credit cooperatives (RUSACCOs) are the only formal financial institutions providing financial services to poor rural households. Currently, only about 15% of rural households have access to savings and credit services. Women account for nearly 50% of the client base of MFIs and RUSACCOs. Cooperatives have inherent constraints to develop their own capital and to provide collateral for commercial loans. The lack of working capital prevents cooperatives to participate in crop marketing. Private traders dominate the market and set the purchase prices, because they pay cash on delivery to the farmers.

#### **Amhara Credit and Savings Institute (ACSI)**

ACSI is one of the 32 microfinance institutions (MFIs) in Ethiopia and among the largest and best performing MFIs in the country. It is the main financial service provider in the rural areas of Amhara region. ACSI has a wide outreach with a network of 401 branches covering all woredas and 3,449 kebeles of the region with 9,000 staff. ACSI has one million active borrowers and 4 million active savings clients. Granting of agricultural production loans to farmers is based on business plans submitted by the loan seeker, which are appraised by ACSI for borrower's eligibility and loan feasibility. The amount of loan taken by farmers ranges between birr 4,000-5,000 for onion production at an annual interest rate of 18%. Loans to individuals are usually provided against group collateral. All loans have to be repaid within one year.

ACSI has four branches in Fogera with 48 staff and five branches in Mecha with 64 staff. Most of the staff works in the field dealing directly with farmers' agricultural production loans. Good systems have been developed for the follow-up of loan utilization and loan client relations. Most loans to farmer families are signed in the name of the wife. Women are recognized to be more diligent in dealing with financial issues. Repayment in Mecha and Fogera woredas is practically 100%.

AgroBIG has supported ACSI with a Loan Fund of 5.7 million birr. The Fund is to be used for working capital lending to agricultural cooperatives at 13% interest for the selected value chains and for wholesale lending at 11% interest to RUSACCOs in the Mecha and Fogera woredas. Generally, farmers and cooperatives prefer to borrow from the cooperative financial institutions at lower loan interest and to receive an annual dividend from the cooperative financial institutions.

#### **Cooperative financial institutions**

A large number of rural cooperative financial organizations have been established in the country to cater for the financial needs of agricultural and other cooperatives and their members. The rural cooperative savings and credit institutions in Ethiopia comprise of a total of 113 savings and credit unions and more than 15,000 rural savings and credit cooperatives (RUSACCOs). These are members' own institutions and capital for lending is collected from members' share contributions and savings.

The Cooperative Promotion Agency (CPA) is mandated to supervise and audit the operations of cooperative financial institutions according to the Cooperative Law and a large number of CPA field staff is engaged in training and supervision of these organizations and the implementation of the RUFIP programme.

There are 26 cooperative savings and credit unions each serving their designated woredas in Amhara region. They provide loans to farmers' agricultural cooperatives and other types of cooperatives that are members of the unions. This is the main lending channel to RUSACCOs for additional lending capital for loans to individual farmer members. Loan amounts are relative to the share and savings contributions of the member organizations. Loan interest is about 17% for loan duration of one year. Repayment is nearly 100%.

At the kebele level, farmers receive loans from a total of 2,825 rural savings and credit cooperatives in the Amhara region. Lending interest is stipulated by the bylaws of the RUSACCO as agreed by the members and is currently about 17%. Normally the loan duration is one year and group collateral is used for repayment security. Capital for lending by RUSACCOs is limited, which restricts farmers' opportunities to invest in agricultural production. Repayment culture in rural lending is excellent and normally 100% of the loans are repaid.

### **Other banking institutions lending to rural farmers and agricultural cooperatives**

The National Bank of Ethiopia governs and regulates financial institutions in the country. Foreign investment in the financial sector is not allowed in Ethiopia. A large number of banks operate mainly in large towns and are increasingly widening their branch network also to the woreda capitals. Farmers' cooperatives can receive loans from these banks at commercial terms and by providing collateral for repayment security. Although there is a mobile banking system, M-birr, in place, its services are not yet widely used.

### **AgroBIG grants**

AgroBIG provides co-funding to value chain actors for investments in the selected value chains, including onions, through three grant funds:

- Innovation, Demonstration and Research Fund (IDRF); 85% contribution for development and demonstration of innovative approaches and support to research programmes.
- Value Chain Fund (VCF); 85% contribution for small farm investments in Mechanization and farmer services.
- Matching Grant Fund (MGF), 50% contribution for large scale investments in post-harvest handling and processing for markets.

To benefit from these grants, applications are to be made that are screened and awarded by a committee based on their usefulness in improving the efficiency of the value chain.

### **6.3.3. Business enabling environment**

The business enabling environment at the national and local level encompasses policies, administrative procedures, enacted regulations, market standards and the state of public infrastructure. In addition to these more formal factors, social norms, business culture and local expectations can be powerful aspects of the business enabling environment. Understanding these unwritten rules of society is essential to understand why value chain actors behave the way they do. These more informal factors often impact on women or people from minority groups who enter or are trying to enter the value chain as actors.

The second Growth and Transformation Plan (GTP II) is a main policy document 2015-2019 that has been adopted by the Ethiopian government. It emphasizes the significance of the agriculture sector as a major source of economic growth. The strategy strongly supports the intensified production of marketable farm products for domestic and export markets, by small holders and private agricultural investors. It also encourages a shift to production of high value crops focusing on high productivity areas and intensified commercialization.

Managing natural resources and building the capacity of farmers and government structures is also emphasized. During the GTP II period, application of improved technologies will be intensified to ensure the supply of the required quantity and quality of fertilizer, improved seeds, and small farm machineries.

There are capacity limitations at all levels that include human resources, working premises,

equipment, communications, machinery, furniture and other facilities. ATVETs and FTCs require capacity building and improved facilities in order to strengthen their competencies to upgrade the skills of DAs and subject matter specialists. There is also weak research-extension-farmer linkages and lack of communication and collaboration with the private sector.

## **7. CROSS CUTTING ISSUES**

### **7.1. Gender Inequality**

In Ethiopia and in the AgroBIG woredas, women are generally disadvantaged. In meetings, few women attend, and their voices are often not heard. Onion production is a laborious farming activity which needs high labour input from planting to harvesting and marketing. Both women and men are taking part in the process of production with a varying degree of involvement. Despite the considerable contribution of women, men have the main responsibility for selling the harvested onions, reducing women's access to and control over the produce. One of the factors that have turned out to influence the adoption of new technologies is whether the farmer is female or male. Due to many socio-cultural values and norms men have freedom of mobility and participation in different meetings and consequently have greater access to information. Therefore, male heads of household seem to be more likely to adopt new varieties, technologies, cultivation practices, etc.

AgroBIG conducted a gender study at an early stage, which identified possible intervention. In particular AgroBIG has implemented targeted interventions, and avoided standard awareness raising trainings. Specific interventions targeting women have included the training of 66 women in Fogera on agronomic practices and food preparation to help these women grow and prepare vegetables for sale at the local market. AgroBIG is also in the process of establishing a very special loan fund exclusively for women entrepreneurs. The support to family financial literacy that AgroBIG has channeled through ACSI, is another example where women have been in the focus.

### **7.2. Reducing Social Inequalities**

Taking the local situation AgroBIG has given a strong focus on supporting efficient and profitable value chains that are inclusive. At operational level the inclusion of vulnerable groups like people infected with HIV/AIDS or having disabilities is not an easy one, considering that much hard work is needed in the field. For AgroBIG some targeted interventions could be possible.

Women are disfavored in the society in terms of generating direct income from farm produce as compared to male. So, in order to improve women's income, roadside market is one means that can be considered. It involves women in direct sale of farm produce in program woredas, and hence, it will help the whole family to get good price from their produce. Additionally, women are active enough to sort and grade onion in the farm, and thereby get better income. Sorting and grading will improve quality of marketable onion, and hence it will become win-win approach both for farm owners and women.

### **7.3. Climate Change Adaptation**

Issues directly related to climate change adaptation and mitigation has not been high on the AgroBIG agenda. Soil conservation activities are for instance beyond the scope of the Programme. The activities undertaken by REILA can be seen as a support activity in that farmers, once they are secure on their land, are prepared to invest in land improvement including the planting of trees, which means being better prepared for hard times. Measures that have been taken by AgroBIG have included creating awareness of more efficient use of water in irrigation systems as

well as considerations that have been identified during the Environmental Impacts Assessments that have been conducted. On the wider approach to environmental concerns, AgroBIG has taken serious measures to prevent and stop the wide and irresponsible use of chemicals that in the past have taken place in Fogera to combat the occurrence of weeds. A 3-days awareness and mitigation campaign was undertaken for 83 participants, drawn from irrigation cooperatives, farmers and DAs, chemical service providers etc. The result has been a developed action plan on the roles and responsibilities to be taken by each stakeholder, in combination with the established sprayer groups in the area created a responsible use of the chemicals. Manual well drilling is a mitigation measure for water shortages in the dry season that need to be promoted.

## **8. OPPORTUNITIES, CONSTRAINTS, AND SOLUTIONS**

### **8.1. Opportunities**

The following factors can be considered as opportunities for onion production in the project woredas:

- Increasing demand with increasing population and purchasing power,
- Most of program woredas are accessible to main asphalt road to Bahir Dar, Gondar, and Addis Ababa.
- Existence of irrigation schemes, sufficient water and land resources
- Availability of ground water potential in Fogera and Dera woredas that can be developed and used for second cycle irrigation
- Existence of Farmer Training Centers
- Ongoing infrastructure development, rural electrification and improved rural road
- Farmers were organized as irrigation water user cooperative (Fogera, North Mecha, Dera and Bahir Dar Zuria)
- Availability of Wholesale traders and collectors
- Availability of support institutions, which include governmental and non-governmental organizations such as Agro BIG.

### **8.2. Constraints**

Onion production in the programme woredas and in the marketing areas face the following challenges:

Production:

- Lack of good farm management and good agronomic practices for onion cultivation
- Poor quality onion
- Seed supply systems still quite informal
- Absence of market-oriented production
- Failure of primary cooperatives to participate actively in vegetable marketing,
- Lack of cropping schedule
- Supply of untimely and low-quality agricultural input
- Occurrence of pests and diseases
- Shortage of labor at peak periods

Post-harvest:

- Poor post-harvest handling (drying facilities)
- Inadequate adoption of onion storage technologies from research centers like Melkasa Agricultural Research Center

Marketing:

- Absence of reliable and timely market information systems
- Poor market linkage facilitation for producers and collectors
- The involvement of large numbers of illegal brokers and traders and lack of commitment to control or regulate them,
- Price fluctuation that result in contract breach
- Lack of receipt system in selling and buying of onion
- Failure to break entry barrier that hindered farmers to sell in Bahir Dar city due to lack of open market place
- Lack of organized retail centers for cooperative and union in big market like,
- Cooperatives have limited capacity for marketing and little knowledge of marketing concepts
- Insufficient working capital and difficulty to access credit
- Poor coordination among market actors and lack of trust
- Transport from farm to collection points is a constraint for farmers
- Import of cheap onions from the Sudan

Processing:

- Absence of processing companies or facilities

### 8.3. Solutions

For the aforementioned constraints or challenges, solutions are suggested in Chapter 10. The 2018 consulting team would like to recommend specifically for the harvesting problem, which creates quality and marketing difficulties. The reason why farmers apply water in onion fields just before harvesting is to ease the harvesting since the soil becomes too dry to dig out the product. This can be solved by using small machineries for a group of farmers. The machines are multi-purpose functions such as plowing, digging, transporting, and pumping. It can be operated only by a single person for all operations. Farmers can buy such machines in groups and facilitate their farming works and quality of the product. Suggested model which was originally built for potato harvesting is shown below in Figure 8:



Figure 8. Potato and onion harvesting machine

## **9. INTERVENTIONS BY GOVERNMENT, AgroBIG AND OTHER NGOs**

Based on the above, it is clear that many farmers still are operating at the subsistence level and a transformation to more commercial farming systems are desirable. Attention is still very much focused on production increment and much less on fulfilling the demand and requirements of consumers. Major intervention areas that the government, in association with development partners such as AgroBIG, has to address are mentioned below.

### **Improving production and post-harvest management:**

- Establishing certified agro-dealers that can supply registered and certified seed and other inputs from reliable source,
- Training farmers and development agents on full package of onion production, harvest and post-harvest handling, and thereby improve productivity and quality,
- Introducing storage system designed by Melkasa Agricultural Research Centre then training farmers to build from local materials,
- Introduction of irrigation technology that save water so that area under irrigation can be increased,
- Introducing modern harvesting technology,
- Avoiding watering the field before harvest and implementing recommended harvesting procedures mentioned in the document,
- Introducing minimum quality requirement of bulb onion for marketing and then training farmers on it,
- Strengthening onion seed producing and marketing cooperatives, building their capacities in seed processing and collection center,
- Introduction of rural transport supported with mule drawn carts,

### **Strengthening Market and Business Development:**

- Organizing existing primary cooperatives as union in collaboration with Regional Cooperative Promotion Agency and then capacitate them to actively participate in marketing
- Working with Bahir Dar city administration so that the municipality Establish open and free market in the city for rural community to use it without any license,
- Building pilot store and shop for retail and wholesale for primary cooperatives and unions in Bahir Dar open market to be built
- Establish roadside markets as retail outlets in production areas
- introducing collection centers for cooperatives and regional terminal market for horticulture crops in general
- facilitating strongly market linkage for producers and coop/unions
- facilitating reliable and timely market information service delivery for all program woredas
- strongly regulating illegal brokers or licensing them,
- controlling illegal seed suppliers
- introducing receipt system in onion marketing

### **Increased Value Addition:**

- promoting and encouraging introduction of onion processing technology from India and other countries in collaboration with regional investment bureau and private sectors
- Supporting business ideas in agro-processing

### **Strengthening the capacity of private and public service providers:**

- Training Model farmers, Das, Agricultural Extension experts, on onion production, harvesting and post-harvest handling,

- Planting onion on FTC with full-package and demonstrating all recommended practices to farmers at all steps, input used, planting method, crop and water management, harvesting, curing, packaging and storage.

#### **Cross cutting issues**

- Awareness created on environmental issues, particularly wise use of pesticides and disposal of containers
- Awareness created on efficient and wise water utilization in the irrigation system
- Targeted activities aimed at youth groups and women to employment creation
- Establishment of multi stakeholder platform for networking and planning to support producers, market linkages, consumer demands, etc through discussions, experience sharing and contact formation
- Engaging women both in on farm and off-farm activities to improve their income,

#### **Value Chain Financing**

- With three Grant Funds established by AgroBIG, the following specific interventions have been financed by the Programme: The Innovation, Demonstration and Research Fund (IDRF) has enabled the demonstration of innovative approaches for example in the development of outgrower systems, innovative means of rural transport, irrigation, seed supply and for providing support to research programmes. The Value Chain Fund (VCF) has provided
- support to small farm investments in Mechanization and improved farmer services including the provision of water pumps, animal carts, weighing scales, crop collection centres, animal feed mills, crop sprayers etc. The Matching Grant Fund (MGF) has supported large scale investments in processing for markets such as large-scale fruit and vegetable distribution centres, fertilizer stores and sales centre. In this way, a total of 166 grants have been awarded with an AgroBIG contribution of 26 million for a total investment value of 46 million.



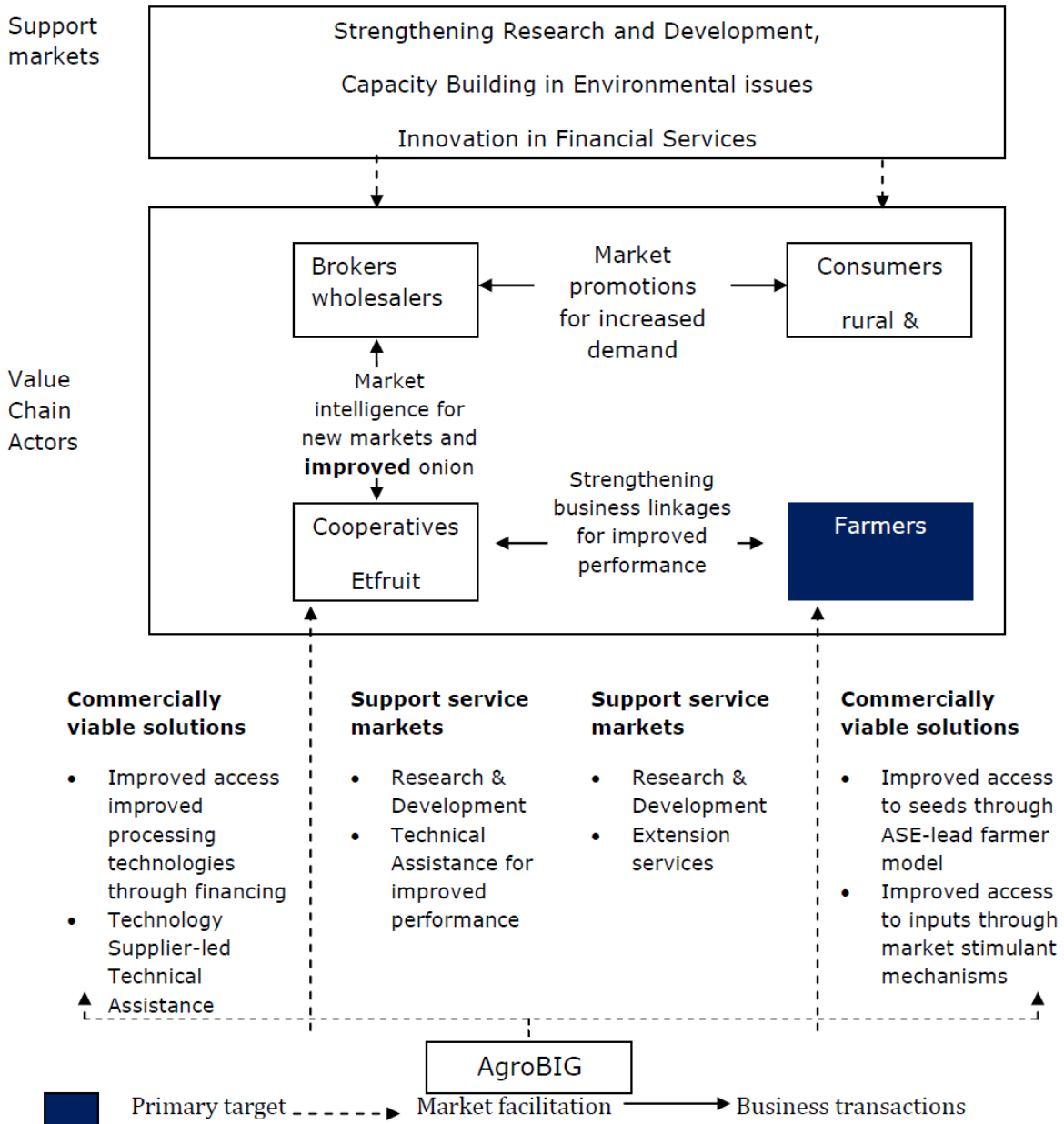


Figure 9. Agro-BIG intervention strategy

## 10. Annex

### 10.1. Lists of contacted persons

S.N	Name of contacted collector/trader	Woreda	Town	Business type /Organization and Responsibility	Mobile telephone	fixed Line
1	Ato Xilahun	North Mecha		collector		
2	Ato Hunagna Worka	North Mecha	Merawi	Collector and Retailor	09-43580676	
3	Ato Birhanu	North Mecha	Merawi	Woreda Agricultural Office Head	09-18072410	
4	Ato Yihune Minale	North Mecha	Merawi	Woreda Agricultural Office, Ex-head	09-18070229	
5	Ato Garamow Tasfa	North Mecha	Merawi	Wholesaler, Vegetable	09-75582327	
6	Ato Tazeb Feleke	North Mecha	Merawi	Wholesaler, Vegetable	09-18413368	
7	Ato Tewachew	North Mecha	Merawi	Koga Irrigation Expert	09-18747482	
8	Ato Sharaw Abi	South Mecha	Mahal Genet	Retailor of vegetable	09-32275789	
9	Ato Ashabir Gashu	South Mecha	Mahal Genet	Retailor of vegetable	09-75583225	
10	Ato Takele Getahun	South Mecha	Mahal Genet	Woreda Agricultural and livestock. extension dept head	09-18083503	
11	Ato Tesfahun Alahany	South Mecha	Mahal Genet	WoT, expert	09-18231475	
12	Ato Aseffa Shababaw	South Mecha	Mehal Gennet	Woreda Agricultural and livestock, head	09-18193341	
13	W/ro Alamush Mendefro	Woreta Town	Woreta Town	Woreta Town Trade office, Marketing Expert	09-18009734	058-4461376
14	Ato Mekanint Awoke	Fogera	Woreta	WoT, expert	09-18095913	
15	W/ro Asmarat Alamayo	Fogera	Woreta	WoT, Mrkt Information Expert	09-18811222	
16	Ato Inene Andarge	Fogera	Worete	WoT, Vegetable Marketing Expert	09-18035499	
17	Ato Getasew Zewdu	Fogera	Woreta	Cooperative Marketing Office	09-18186349	
18	Ato Ishetu Dires	Fogera	Woreta	Irrigation Agronomist	09-18162092	
19	Damis	Fogera	Woreta	Irrigation	09-18094098	
20	Ato Setie Abdi	Fogera	Worete	Woreda Agriculture office, extension team coordinator	09-18026041	058-4460116
21	Ato Asmamew Yimer	Dera	Anbasame	WoT, expert	09-23561773	
22	Ato Misgenew Daba	Dera	Anbasame	Woreda Cooperative Promotion office, mrk team leader	09-32731287	
23	Ato Manaye Ayalew	Dera	Anbasame	Woreda Cooperative Promotion office, mrk expert	09-42321890	
24	Ato Habtamu	Bahir Dar Zuriya	Bahir Dar	Woreda Agricultural Office	09-18086791	
25	W/ro Yenenat Barihe	Bahir Dar Zuriya	Bahir Dar	Woreda Cooperative Promotion office, Team Leader	09-18727717	
26	Ato Andarge Yimano	Bahir Dar Zuriya	Bahir Dar	Woreda Irrigation team, team leader	09-18145891	
27	W/ro Nardos Washun	Bahir Dar Zuriya	Bahir Dar	Woreda irrigationteam team , irrigation agronomist	09-18736609	
28	Ato Amony Asmara	Bahir Dar City	Bahir Dar	Wholesaler	09-18010018	058-2208623
29	W/ro Maritu Niguse	Fogera	Woreta Katama	retailer	09-18163969	
30	w/ro Fatuma Mahamad	Fogera	Woreta Katama	retailer	09-34005023	
31	Ato Abbayneh Kase	Fogera	woreta ketema	retailer	09-18318714	
32	Ato Mekanint Asrat	Fogera	Fogera	Wholesaler	09-185321	
33	Ato Samahany Niguse	Gondar	Gondar	Wholesaler , hotels	09-18086576	
34	Ato Iyacho Gizaw	Dera		Wholesaler	09-18092248	
35	At Ayferem Wase	Dera	Gumara	Wholesaler	09-18094950	
36	W/ro Zaboo Messele	Dera	Gumara	retailer		
37	W/ro Tiringo Mucha	Dera	Gumara town	retailer	09-18455713	
38	Ato Assafaw Alamnew	Dera	Gumara town	Wholesaler	09-18089460	
39	Ato Malaku Asaffa	Woreta 04	Woreta 04	Wholesaler	09-18073037	
40	Ato Nigus Align	Kahar- Micha'el	Kahar- Micha'el	wholesaler	09-18703007	
41	W/ro Yisarach Alem	Bahir Dar Zuriya	Addis Alem	retailer		

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