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ADDIS CHAMBER



**Compendium of Value Chain Studies on Selected High
Value Agricultural Products
Volume I**

**Addis Ababa Chamber of Commerce and sectorial
Association**

**Addis Ababa, Ethiopia
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AACCSA is an autonomous, non-governmental, non-political and non-profit organization established in 1947 by proclamation with the objectives to provide different business development services, safeguard the rights and benefits of its members, and to accelerate trade and investment in the country.

Vision, Mission and Value Statements of AACCSA

Vision

To be instrumental in the flourishing of vibrant and prosperous businesses in Ethiopia.

Mission

To support our members, build competitive, sustainable and prosperous businesses; to advocate for business-friendly environment; to contribute for the overall development of the private sector, and serve as a platform for business networking, through our superbly professional and dedicated staff, utilizing state of the art technology, and proactive partnerships; and maintaining high ethical standards.

Values

AACCSA has endorsed values that would underpin and guide its operations comprising of Focus, Integrity, Innovation, Credibility, Professionalism, Partnership, and Excellence, which is abbreviated as FI2CP2E.

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This document is published by Addis Ababa Chamber of Commerce and Sectorial Associations (AACCSA), with the financial support from GIZ. The objectives of the publication are:

- To create better understanding of the agriculture and food processing industry sub-sector ,
- To provide inputs that enable investors embark on investment, and
- To facilitate necessary forms of support for businesses thereby attracting investment, creating jobs and building necessary partnerships.

Disclaimer: The views expressed in the journal do not necessarily reflect the views of AACCSA or GIZ. The consultants are responsible for them.



EDITORIAL

Since its establishment 75 years ago, Addis Ababa Chamber of Commerce and Sectoral Associations / Addis Chamber/ has been at the forefront in advocating the causes and interests of the business community and strive to achieve an improved doing business environment and private sector development process. The chamber has been conducting several empirical researches with a view of effecting evidence-based policy influencing. The findings of such studies have so far been used as inputs in policy advocacy revision initiatives by government agencies. In addition, Addis Chamber has been promoting synergetic relationship with various stakeholders including the government and development partners with the prime objective of enhancing private sector development. In this regard, the chamber has produced various research reports, policy briefs, surveys and position papers. Extensive impact assessments on specific government policies were conducted and tabled for discussion at stakeholder forums, seminars, and symposia. It has been actively playing its role in sponsoring, organizing and facilitating public-private consultation/dialogue forums and in conducting numerous awareness campaigns through its media outlets.

Taking into account developments taking place at national and international levels as well as its incremental calling to play even higher roles, AACCSA is now enhancing its catalytic roles to support developments in Addis Ababa. Moreover, the chamber aspires to be instrumental in the flourishing of vibrant and prosperous businesses in Ethiopia.

In light of the above, Addis Chamber signed a grant agreement with GIZ, German Corporation for International Cooperation in mid of December 2020 to implement a project entitled “Cluster Support for the Agriculture and Food Industries in Ethiopia”, which is intended to benefit Agribusiness companies in Ethiopia. In this connection, one of the areas AACCSA has recently engaged is on studying the potential of selected high value agricultural products for exploring new areas of value additions and investment to the private sector. This initiative has one of its principal objectives, to form a better knowledge base on parts of the agriculture and food processing industry sector, as a basis for investment and providing various support for business in order to attract investment, create jobs, and build public private partnerships.

In this connection, one of the areas Addis Chamber has recently engaged is on studying the potential of selected high value agricultural products for exploring new areas of value additions and investment to the private sector. To this ends, from a total of thirteen studies of which seven are on the opportunity and the remaining six on value chain of selected high value agricultural products in fruits, cereals, aromatic plants & herbs, and spices with high potential for value additions and processing for various uses. These studies are now completed and blended together in to Value Chain (Volume I) and Business Opportunity Studies (Volume II).

Addis Chamber extends its gratitude to all organizations who volunteered their time to respond to questionnaires, availing the necessary data /information pertaining to each product and providing their expertise to upscale the studies in the various workshops commissioned by the chamber.

Finally yet importantly, AACCSA would like to thank and appreciate GIZ for extending the financial support to the studies.

FOREWORD

Background

Addis Ababa Chamber of Commerce and Sectorial Associations (AACCSA) is a voluntary business membership organization with a mission of promoting business and investment by providing demand driven services for its members and stakeholders, and advocating for favorable business environment towards fostering the development of a vibrant and dynamic private sector. In so doing, the chamber has been involved in various areas that are believed to create, nurture and sustain a pro-business environment conducive to businesses and contribute to sustained economic growth in the country. This volume is the latest special engagement of the chamber in the value chain study of the agro-processing sub-sector.

Agriculture is one of the pillars of the Ethiopian economy, and the overall economic growth of the country is highly dependent on the success of the agriculture sector. In Ethiopia, agriculture makes a significant contribution to the economy, accounting for 43 percent of the GDP, 90 percent of export, and 85% of employment. Moreover, 83% of the population in Ethiopia living in the rural areas depend on subsistence agriculture.

Nevertheless, the agricultural sector in the country has been exposed to a number of challenges, among others include impacts of climate change on agriculture, lack of appropriate land use system, soil and environmental degradation, limited use of improved agricultural technologies, predominance of subsistence agriculture, lack and/or absence of business oriented agricultural production system, and limited or lack of access to market facilities. These factors have also significantly marginalized smallholder farmers from taking part in value chain and value addition activities. It is, therefore, remarkable to improve agricultural value chains to envision both the entire economy as well as food security of Ethiopia.

In mid-December 2020, AACCSA signed a grant agreement with GIZ (German Agency for International Cooperation) in the middle of December 2020 to implement the project “Cluster Support for Agriculture and Food Industries in Ethiopia” which also intends to benefit agribusiness companies in Ethiopia. One of the major activities of this project is conducting value chain and opportunity studies on selected agricultural products in fruits, cereals, plants and herbs, and spices with high potential for value addition and processing for various uses. Therefore, AACCSA commissioned consultants to conduct thirteen studies, of which seven are on opportunity and the remaining six on value chain.

This volume is a compilation of value chain studies made on six product groups, namely:

1. Selected spices: Pepper, Ginger and Turmeric
2. Selected fruits: Avocado, Mango, and Papaya
3. Apiculture and Honey
4. Medicinal, Herbal and Aromatic Plants
5. Natural and/or Essential Oil Extracts, and
6. Soybean

The specific topic of each study is as indicated in each study.

The studies are part of the project entitled “Cluster Support for the Agriculture and Food Industries in Ethiopia” that AACCSA is implementing financed by GIZ. The studies were initially produced by four hired consultants, namely: Kilimanjaro Trading and Consulting, Bamha Consulting Services, Getachew Consultancy Services, and Excellence Consultancy & Training PLC in collaboration with AACCSA’s Policy Research and Advocacy Team. Furthermore, relevant experts reviewed them for the better fulfilment of the purpose.

Major objectives of the studies are:

- To create better understanding of the agriculture and food processing industry sub-sector,
- To provide inputs that enable investors embark on investment, and
- To facilitate necessary forms of support for businesses thereby attracting investment, creating jobs and building necessary partnerships.

The reports employed standard and scientific methods of data collection and analysis. In such circumstances, both primary and secondary sources are used. For primary sources interviews, focus group discussions, key informant interviews and observations using structured questionnaire and checklists are put in place. However due to short study period and limited resources, small sample size is used to gather primary data. Officials and experts from relevant government organizations, associations, and researchers who demonstrated interest in the sub-sector were also interviewed. On the other hand, the secondary data are collected from various government sources, including Central Statistics Agency, Ministry of Agriculture, Ministry of Finance, Research Institutes and professionals from the study areas.

While undertaking such studies, field research took much of the time (from March to May 2021). Using both quantitative and qualitative methods, the collected data for primary and secondary sources were analysed and the results presented in descriptive and narrative format.

For such multitude of studies, Addis Ababa, Amhara, Oromia, Benishangul-Gumuz and SNNPR regions are selected to gather data. The studies mainly focused on examining the status of the products, including their supply chain, market potential, possibilities for collective marketing and chain efficiency, assessing and identifying key areas of opportunities, and recommending specific areas within the businesses having potential benefits for producers, processor and consumers.

A validation workshop was hosted by AACCSA between August and October 2021 to review and reflect on the preliminary findings of the studies whereby essential inputs were gathered to further consolidate the findings and recommendations.

This volume is dedicated to providing an insight on the value chain study in relation to the above listed products to businesses, investors and academia to enhance investment as well as future comprehensive researches.

Finally, AACCSA believes that this compilation of studies as well as the steps followed all the way through will greatly assist businesses, investors and concerned stakeholders to have wider insight on the existing potentials as well as policy gaps related to value chain, investment, and business uses of these high-value agricultural products and trigger necessary actions.

Addis Ababa Chamber of Commerce and Sectorial Associations

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Acronyms

AACCSA	Addis Ababa Chamber of Commerce and Sectoral Association
AfCFTA	African Continental Free Trade Area
AFRACA	African Rural and Agricultural Credit Association
AGOA	African Growth and Opportunity Act (AGOA)
AGP-made	Agricultural Growth Program-Agribusiness and Market Development
APB	Agro Processing Business
ATA	Agricultural Transformation Agency
BSD	Business Service Development
CAGR	Compound Annual Growth Rate
CB	Certifying Body
COMTRADE	United Nations Commodity Trade Statistics Database
CR4	Four-Firm Concentration Ratio
CSA	Central Statistical Agency
DBE	Development Bank of Ethiopia
DFID	Department for International Development
DPs	Development Partners
EAB	Ethiopian Apiculture Board
EBA	Ethiopian Beekeeper's Association
EBI	Ethiopian Biodiversity Institute
ECAE	Ethiopian Conformity Assessment Enterprise
ECC	Ethiopian Customs Commission,
ECTA	Ethiopian Coffee and Tea Authority
ECX	Ethiopian Commodity Exchange
EFMHACA	Ethiopian Food, Medicine & Health Care Admin & Control Authority
EHPEA	Ethiopian Horticulture Producers' and Exporters' Association
EIAR	Ethiopian Institute of Agricultural Research
EIC	Ethiopia Investment Commission
ENTAG	Ethiopia-Netherlands Trade for Agricultural Growth
ENTAG	Ethiopia Netherlands Trade for Agricultural Growth
EOs	Essential Oils

EPHI	Ethiopia Public Health Institute
EPOSPEA	Ethiopian Pulse, Oil seeds and Spice Processors-Exporters Association
ESA	Ethiopian Standards Agency
ESAHPGPA	Ethiopian Spices, Aromatics, Herbs Products Growers and Processors
EU	European Union
FAO	Food and Agriculture Organization
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FAS	Foreign Agricultural Services
FBPIDI	Food, Beverage, Pharmaceutical Industry Development Institute
FCA	Federal Cooperative Agency
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
FOREX	Foreign Exchange
GAP	Good Agriculture Practice
GDP	Gross Domestic Products
GERD	Great Ethiopian Renaissance Dam
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit.
GOE	Government of Ethiopia
GTP	Growth and Transformation Plan I
GTP II	Growth and Transformation Plan II
IAIP	Integrated Agro Industrial Park
ICT	Information and Communications Technology
IFAD	International Food and Agriculture Development
IGAs	Income Generating Activities
ISO	International Organization for Standardization
ITC	International Trade Center
JICA	Japan International Cooperation Agency
KII	Key Informant Interview
MAP	Medicinal and Aromatic Plants
MoA	Ministry of Agriculture
MOARD	Ministry of Agriculture and Rural Development

MoFED	Ministry of Finance & Economic Development
MoTI	Ministry of Trade & Industry
MRL	Maximum Residual Level of Pesticides residuals
MSPA	Mauritius Sugar Producers' Association
MT	Metric Ton
NBE	National Bank of Ethiopia
NGO	None Governmental Organization
NIE-SCP	New Institutional Economics–Structure-Conduct-Performance
NTBs	Non-Tariff Trade Barriers
OS	Opportunity Study
PLC	Private Limited Company
PPP	Purchasing Power Parity
PSI	Policy Research Institute
PVCA	Participatory Value Chain Analysis
PVCA+G3	Participatory Value Chain Analysis with Gender, Green & Governance
SMEs	Small and Medium Enterprises
SNNP	Southern Nations and Nationalities and Peoples
SNV	Netherlands Development Agency
TOR	Terms of Reference
UAE	United Arab Emirates
UNCOMTRADE	United Nations International Trade Statistics Database
UNCTAD	United Nations Conference on Trade and Development
UNFAO	United Nations Food and Agriculture Office
UNIDO	United Nations Industrial Development Organization
UNIDO	United Nations Organization for Industrial Development
USAID	United States Agency for International Development
USD	United States Dollars
USDA	United State Department of Agriculture
VA	Value Chain
VAT	Value Added Tax
VCA	Value Chain Analysis

WARC	Wondogenet Agricultural Research Center
WB	World Bank
WTO	World Health Organization
WMS	Williams & Marshall Strategy
WTO	World Trade Organization
2SLS	Two Stage Least Square

Chapter One

Value Chain Study on Spices: Pepper, Ginger, and Turmeric



pepper



Ginger



Turmeric



Executive Summary

Ethiopia is a homeland of variety of spices with organic contents, rich colors, flavors, and aromas. The country has immense comparative advantages that emanates from its natural endowment of agricultural products including spices. Out of the total 110 spices identified almost half of these, 50 spices are found in Ethiopia, which is a great potential for investors. This study analyzed Ethiopian potential in the production, processing and export of selected spices such as Pepper, Ginger and Turmeric products given its comparative advantages in wide range of altitude, unique and diverse climate, abundant labor, vast land, and water resources. It analyzed patterns and trends of production and consumption in the domestic and international market, comparing Ethiopia's standing vis-a-vis African and other countries, mapping actors' linkages, challenges and constraints, and finally proposed suggested recommendations.

Based on the assessment, the domestic market for the selected spices is increasing overtime. One can see the potential and opportunities by looking at the presence of appropriate or suitable environment for cultivation of different varieties of spices in Ethiopia. There are also increasing trends in population growth, rate of urbanization, better awareness of its health benefits, accessibility that has contributed for its increasing demands, etc. The Government of Ethiopia is promoting Agro-industrial Processing Parks and declared spices as one of the major areas of economic development and sources of foreign hard currencies for the country as per the 10 years agricultural development plan. Ethiopian spices do not have intrinsic problems of natural quality and almost all the spices meet the international intrinsic natural quality standards. Spice crops are widely traded internationally and have a high potential for expansion and diversification of export earnings of Ethiopia.

The Coffee and Tea Authority has developed a 10 Year Spice Development Strategy (2013–2022) in order to solve sustainably the challenges and constraints that spice sector has been facing in value adding and marketing. At the end of the strategy period, Ethiopia is envisioned to become among the largest producers and exporters of spices in the World. As a result, the strategy envisions increasing the land allocated for spice sector development from its current level of 88.48 thousands hectare to 459.83 thousands hectare and increase total production from its current level of 632.4 thousands tone to 1.14 million tones. In addition to satisfying the domestic demand, it has planned to raise the foreign exchange earning of the country from USD 16.02 million to US\$ 137.88 million.

Even during the Covid-19 pandemic, the production and consumption of spices have increased both in the domestic and export markets. Owing to the food habit, most of the people use large quantities of spices in their daily food preparation and this indicates high local demand. The Ethiopian Agricultural Research Organization (EARO) is conducting research pertinent to the spices subsector in some of its specialized and semi specialized research centers such as: Tepi , Jimma, Debrezeit, Kulumsa, etc. The latest Government report published on August 27, 2021 indicated that Ethiopia has earned more than USD15.7million from spices and USD607million from coffee and USD3million from Tea exports earnings. Overall, spices production and export is not as expected given the potentials of the country because of the challenges faced in quality of supplies, poor linkages between the producers, processors and exporters, lack of processing industries of spices in the country and difficulties in fulfilling the required high international quality standards.

Looking at individual spice product, for example, in 2010 Ethiopia produces 265,276 metric tons of Pepper which has grown to 374,413 metric tons in 2019. In depth analysis shows that from 2007 onwards, the production of Pepper has shown significant jump both in terms of the area harvested and productivity (yield per hectare). In similar trend, from 2011 to 2019, imports of Pepper have increased

to an average quantity of 245 MT per annum representing an average value of 490,000USD per annum which demonstrate a high room for import substitution potentials in the sub sector.

Ginger production and marketing has been affected by disease and declined since the last couple of years even if various institutions, both at the Federal and Regional levels, have taken many measures. Accordingly, a study was conducted in order to fight the Ginger bacterial diseases and control the bacterial expansions. Ginger plant will be ready for the final output market within 9 months, which is less than the time required for other fruit products like Avocado and Mango. Moreover, the Ginger market gives high prices for fresh Ginger.

The use of Dry Season Irrigation based cultivation techniques on Ginger cultivation which has been tested and piloted by some of the Agricultural Research Organizations (Areka, Jimma and Teppi-Mizan Universities) has become one of the effective techniques identified and worked to control the Ginger Bacterial Wilt (Gingible Ser Atewlege Besheta). Once this approach is adopted and practiced in different regional states, Ginger's potential could be exploited for the export market. Between 2007 and 2019, the country has imported an average of 156 MT of ginger per annum, representing an average value of 190,000USD per annum. To this contrast, up to 2013/2014 there has been a sharp increase in the export of Ginger in Ethiopia. Between 1998 to 2013, Ginger exports amounted to an average of 6,360 Metric tons per annum representing an average value of 7, 209, 000 USD per annum. However, from 2014 onwards, there has been a sharp decline in the production and export of Ginger in Ethiopia. For instance, in 2014 Ginger exports amounted to 2,900 MT which is further declined to only 6 MT between 2018/19 with equivalent value of 7000USD per annum. This is basically related to Ginger bacterial wilt which resulted in a significantly loss both in qualitative and quantitative rhizome yield in Ethiopia.

According to the data from the Ministry of Trade, in 2012 to 2016, the value of exported Turmeric from Ethiopia was found to be 3,413 metric tons with an equivalent monetary value of 51,420 Birr per annum. From 2017 to 2020, the export of Turmeric from Ethiopia almost doubled, exporting an average of 5, 500 MT per annum. By 2017, Ethiopia had become the fifth leading country in terms of Turmeric export value. This is mainly explained by the fact that, following the impact that disease had on ginger crops in 2014, farmers have shifted to the production of Turmeric.

In all the spices products, the problems get more complex when the country joins the export markets due to the existence of demand of higher end-consumers. Although the Ethiopian spices fulfill the intrinsic natural values and unique characteristics, it has quality constraints along the value chain. The major part of the country's spices are still exported to India where the country makes all the necessary processing activities and standard packaging for export to USA, Europe and the Middle East markets respectively. The main reasons that are contributing for the poor export performances are: poor quality and limited volume of product, lack of expertise in activities throughout the supply chain, under-developed packaging, weak land and sea logistic, high freight cost, lack of market transparency of buyers, increasing competition, trade barriers especially in Europe market, etc. Despite all these challenges, the country can still increase spices export earnings by selling spices under organic certification, which is at high demand in the developed world. The spice subsector is also among the important crops that fit within the strategy of commercialization of agriculture in Ethiopia. To this effect, this study commissioned to Kilimanjaro Consulting and handed over to AACCSA reveals measures to enhance the performance of the spice sector in short, medium term and long-term periods.

1.1 Background and Rationale

The value chain describes the entire range of activities required to bring a product from the initial input-supply stage, through various phases of production, to its final market destination. The production stages entail a combination of physical transformation and the participation of various producers and services, and the chain includes the product's disposal after use. As opposed to the traditional exclusive focus on production, the concept stresses the importance of value addition at each stage, thereby treating production as just one of several value-adding components of the chain (Dubey et al. 2020; UNIDO, 2009).

Policy-makers increasingly focus on the development of agro-industries with emphasis on promoting effective agro-value chains as a means of further expanding the leading role played by agriculture in economic growth and poverty reduction. Such chains uniquely integrate natural sources of supply with the dynamics of food and fiber demand. Their development has a positive impact on employment in both rural and urban areas (off-farm processing and income diversification), offers market access to smallholders, and creates business linkages to small and medium enterprises (SMEs). It also builds up responsible and sustainable relationships among chain actors and enhances food security by reducing post-harvest losses and by extending the shelf life of food and fibers for rapidly growing urban populations.

With their combined effects of employment gains and food security, efficient agro-value chains can play a key role in reducing poverty in the developing world. However, to participate in sustainable agro-value chains, developing countries must cope with the numerous challenges and constraints posed by a continuously changing marketplace. Most noteworthy among these challenges are: the intense competition; the impact that the governance of international supermarkets, retailers and buyers access to markets; the growing demand for high-quality, organic, minimally processed products and the emphasis on traceability and social responsibility; and the increasing risk of marginalization faced by areas with poor infrastructure and small farms.

In view of the importance of Value Chain Analysis for stakeholders engaged in spices businesses, the Addis Ababa Chamber of Commerce and Sectorial Associations (AACCSA) has signed a new Grant agreement in mid-December/2020 with GIZ that heralded the launch of a project entitled “Cluster support for the agricultural and food industries in Ethiopia” that is intended to benefit Agri-Business Companies. As part of the project, AACCSA with Kilimanjaro Consulting has undertaken this Value Chain study on Pepper, Ginger and Turmeric.

1.2 Objective of the Study

The overall objective of the study is to conduct Pepper, Ginger and Turmeric Value Chain study. The specific objectives include assessments of the supply chains of the products, market potentials, and market actors, linkages between producers, traders and processors; identify major constraints and give recommendations for improvement in the overall value chains.

1.3 Scope of the Study

The scope of the study is limited to conducting value chain study on Pepper, Ginger and Turmeric products. In the process of conducting the value chain (VCs) studies, the Consulting firm focuses on the specific tasks such as supply chain of the products and the market potentials both domestic and export.

1.4 Methodology of the Study

Both secondary and primary data types are used in this study. The data collection tools selected and designed according to the target participants in the assessment. Generally, three main data collection techniques are used to gather data for the purpose of this value chain study. These included the following: Desk Review, Key Informant Interviews (KIIs) and Focused Group Discussion tools. Audio recording and on spot note taking are used as appropriate. Moreover, triangulation method is also used to check the validity and reliability of data.

Furthermore, mapping of the value chain is undertaken in order to understand the characteristics of the Chain Actors and the relationships among them, including the study of all actors in the chain, of the flow of goods through the chain, of employment features, and of the destination and volumes of domestic and foreign sales. This information has been obtained by conducting surveys, interviews and participatory workshops as well as by collecting secondary data from various sources.

1.5 Review of Theoretical and Empirical Literatures

1.5.1 Review of Theoretical Literatures

i. Concepts of Value Chains

Value chains encompass the full range of activities and services required to bring a products or services from its conception to sale in its final market whether local, national, international or global. Value chain includes producers, inputs suppliers, operation, processors, retailers and buyers. They are supported by a range of technical, business and financial services providers (Kumar & Rajeev, 2016). Value chain stresses the importance of value addition at each stage, thereby treating production as just one of several value-adding components of the chain. A value chain starts with the production of a primary commodity, ends with the consumption of the final product and it includes all the economic activities undertaken between these phases such as: processing, delivery, wholesaling, retailing (FAO, 2013).

In contrast to supply chain which primarily focuses on cost and efficiencies in supply, value chains focus more on value creation, innovation, product development, and marketing. Value chains include the vertically linked interdependent processes that generate value for the consumer. The macroeconomic landscape, policies, laws, regulations, standards and institutional elements such as research and innovation, human resource development and other support services form the environment in which all activities take place and therefore are also important actors and activities in the value chain (Dubey et al. 2020).

Value chains include process actors like input suppliers, producers, processors, traders and consumers. At one end are the producers – the farmers who grow the crops and raise the animals. At the other end are consumers, who eat, drink and wear the final products. In the middle are hundreds and thousands of individuals and firms, each performing one small step in the chain: transporting, processing, storing, selling, buying, packaging, checking, monitoring, making decisions, etc. It also includes a range of services needed in the value chain including technical support (extension), business enabling and financial services, innovation and communication, information brokering, etc.).

Analyzing a value chain for policymaking implies: (i) taking stock of the situation of the value chain; (ii) identifying areas of potential improvements of the value chain that to be introduced by means

of public policy measures; and (iii) assessing the likely economic, social and environmental impacts of the available policy options. Information generated through this analytical work provides insights to stakeholders involved in the policy processes and supports the public policy decision making. The effects of policies targeting specific production processes extend their primary impacts in the economic system according to the same path as the main inputs and outputs. Analyzing impacts of policy options through value chains provides decision makers and other stakeholders with anticipated evidence on likely changes directly induced by policies (FAO, 2013).

ii. Value Chain Actors and Functions

The value chain actors and service providers interact in different ways starting from local to national and international levels. The multitude of functions to produce goods and make them available for the consumers is also expressed in the concept of market chain. The market chain refers to the system that consists of actors and organizations, relations, functions, and product, cash and value flows that make possible the transfer of goods or services from the producer to the final consumer. The following Figure shows the functions of the value chain of.

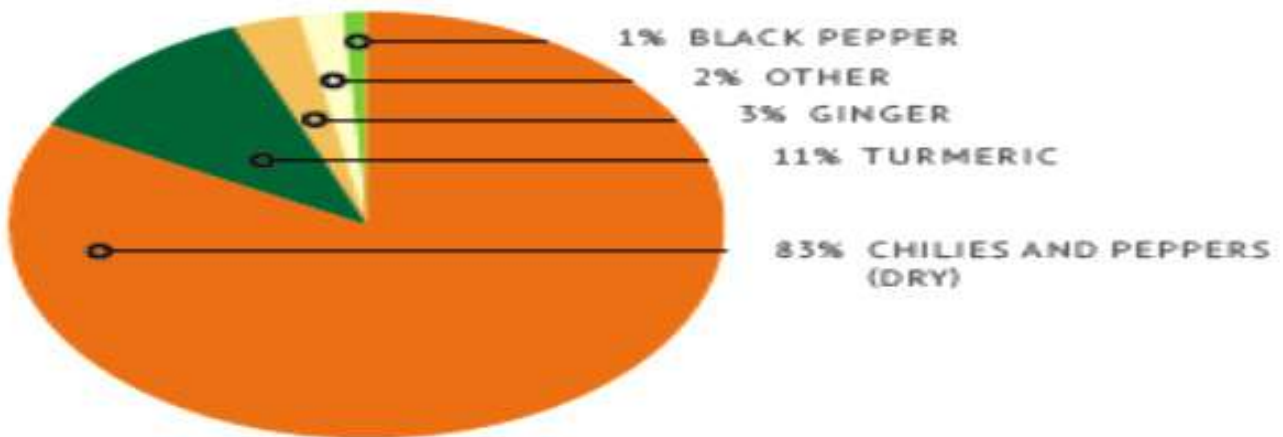
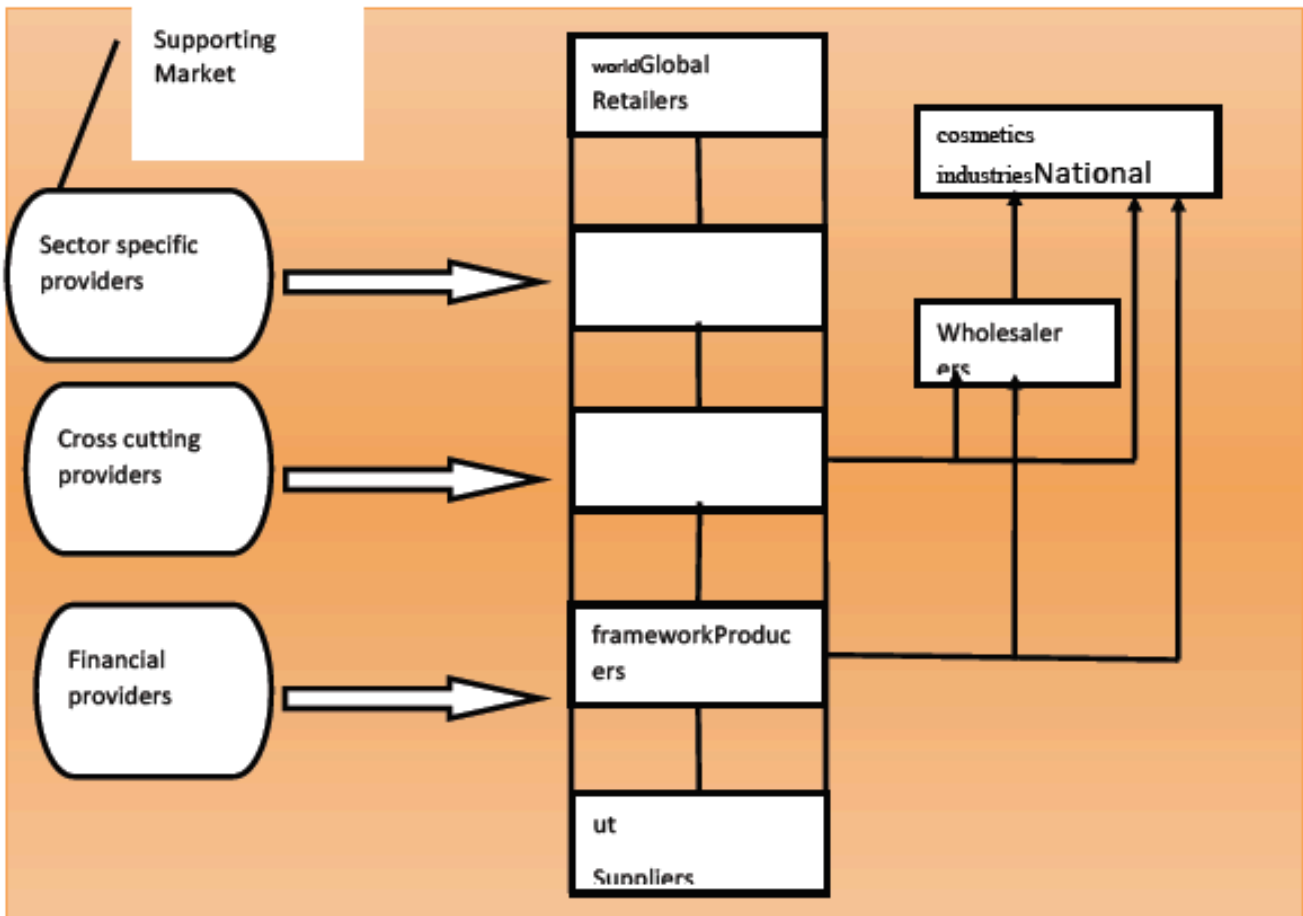
Figure 1: Value Chain Functions

The function through which each actor is prepared to invest and support other actors to maximize the benefit from the chain performance is known as a value chain. This makes the chain to function smoothly and develops the sense of benefiting all actors from having a smooth supply of top quality products in a sustainable manner. Value chain include direct actors which are commercially involved in the chain (producers, traders, retailers, consumers) and indirect actors which provide services or support the functioning of value chain. These include financial or non-financial service providers such as bankers and credit agencies, business service providers, government, researchers and extension agents.

The following Figure illustrates the general framework for value chain actors and support systems.



Figure 2: Value Chain Actors and Support Framework



Production: According to FAOSTAT data, total spice production in Ethiopia increased from 234,000 MT in 2013 to 356,000 MT in 2018. Chilies (294,000 MT), Turmeric (39,000 MT), Ginger (11,000 MT) and Black Pepper (4,000 MT) are the main spices produced in Ethiopia. Chili pepper accounts for over 80% of total spice production. The share of chili pepper is very high and has increased over the years since several diseases decimated the production of ginger in Ethiopia. Ethiopia produces more than 50 spices from the 109 spices listed by the ISO. SNNPR, Oromia and Amhara are the main spice-producing regions in the country. SNNPR is the main producer of ginger and turmeric, primarily in Kaffa Zone, Bench Maji

Zone and Gedeo Zone. Oromia Region and Amhara Region are chiefly responsible for the production of chilies. According to a recent estimate, around 1.1 million households in Ethiopia are engaged in the farming of spices.

Exports: Currently, Ethiopia is not recognized as a major exporter of spices, and the contribution of spices to the national economy is low. Spices represented 0.42% of total export value of the country. Spice exports between 2011 and 2017 amounted to an average of 17,000 MT per annum, representing a value of US\$29 million. From 2013 onwards, Ethiopian exports declined, stabilizing at a volume of 13,000 MT, representing a value of US\$21 million in 2017. This decrease is mainly due to diseases that dramatically affected ginger production.

Ginger: The cultivation of Ginger was started in Ethiopia during 13th century when Arabs introduced it from India to east Africa. Ginger is considered a ‘super food’ and as a replacement for sugar and synthetic additives. Ginger is the underground stem (rhizome) of a perennial herb, which is used as a spice and as a preserve. It is sold in the fresh condition or, more frequently, in a peeled and split dried form or extracted into oils and oleoresin forms. The Ethiopian variety is fibrous, and compared to Asian ginger is more pungent and has higher oil content (8% compared to 6%). The taste is similar to the Nigerian type and is well accepted in Western cuisine. Until 2013, ginger was produced throughout the whole country, primarily in the lowlands of SNNPR, Oromia and Gambela, and was Ethiopia’s most exported spice, primarily to neighboring countries. In 2013, Ginger was the largest exported spice and was responsible for 45% of total export value (US\$12 million). In 2017, ginger exports from Ethiopia had a value of just US\$10,000 and was thus responsible for a negligible share of Ethiopian spice exports.

Turmeric: Turmeric, or *Curcuma longa*, is part of the Ginger family. The plant is native to India and Southeast Asia, and requires a considerable amount of rainfall and a temperature between 20°C and 30°C. The rhizomes (roots) are used fresh or cooked and dried, after which they are ground into powder. The powder is often used in curries, soups and stews. Turmeric is believed by many to have health benefits and is considered a ‘superfood’ in Western societies. Moreover, turmeric is sometimes used as an alternative to salt. The Alleppey type is predominantly produced in Ethiopia. Traditionally, this type is appreciated in Africa, India and North America, while Europe prefers the lighter Madras type. The Alleppey variety has a curcumin content of around 5%, which is superior to Madras (2%), and its color is much darker than the bright yellow Madras type.

In many cases, the Turmeric is overlooked in Ethiopia, resulting in a dark brown kernel, and this turmeric is not suitable for export to Europe, where the kernel is required to be yellow. An alternative processing method comprises slicing and drying (without cooking). Using this method, the drying period can be drastically reduced (4–7 days instead of 14–21 days), resulting in a lower probability of aflatoxine contamination. Also, the slicing method reduces labor intensity and the use of firewood. However, this method requires a major investment in machinery. Currently, Turmeric occupies a large share of the former ginger farms, of which the exported weight increased by 64% to a total amount of 5,851 MT in the period 2013–2017. However, the production of turmeric does not fully compensate for the losses in Ginger production, since the export price is lower.

Chili Pepper: is usually referred to as “pepper” in Ethiopia. The chili pepper can be divided into fresh chili peppers and dried chili peppers. The former type belongs to the fruits and the latter type belongs to the spices. Ethiopia has a good climate and soil conditions for chilies. The most commonly grown type is the ‘Marako Fana’ variety, a pungent long chili of dark red appearance. The local spice blend Berbere is a mix of Marako Fana chilies with other local grown spices. Also grown are the smaller ‘Mitmita’ chilies,

an even hotter red small bird's eye chili pepper. This chili is locally used for the eponymous blend, which also includes cardamom seeds, cloves and salt. Quality in terms of hygiene is low, due to poor drying and storage. This also increases the probability of aflatoxine contamination. Moreover, due to an accumulated disease complex, there is a current drop in chili production in Ethiopia. Chilies are commonly used in soups, stews and sauces to increase pungency and to add flavor. The main production areas are the highlands of Amhara, Oromia and SNNPR.

Black Pepper: Black pepper, the 'King of Spice', was introduced to Ethiopia in the early 1980s. It is often intercropped with coffee trees. Black pepper production is low in Ethiopia. It is grown in SNNPR and Oromia, for example on the Bebeke, Green Coffee Industry and Nati coffee plantations. In Ethiopia, the Panniyur variety is grown, which has a floral taste and high piperine content (> 7%). It is possible to cultivate black pepper successfully at a wide range of altitudes, from 1,500 m to the lowlands of Southern Ethiopia, and where rainfall is high throughout the year. Black pepper is used in many dishes in almost all countries across the world. It can also be used as preservative. In Ethiopia, the productivity of black Pepper ranges from 1,600 kg to 1,900 kg per hectare.

iii. Empirical Value Chain Studies

Although spice production has paramount economic and non-economic multiple importance, its production is still showing shallow coverage and distribution in the country. Besides, the value chain is not as such exploiting the potential value addition and the number of participants to be embedded as chain actors is yet minimal. Spice value addition is shallowly undertaken ranging from the small-scale farmers production to the partial processing and this shows the conventional value chain being undertaken.

Spice production and productivity in the country is not fully maximized to the extent of the potential possible to reach while the value chain is not addressing multiple value addition options benefiting the farmers in the form of greater marketing margin. Although the production of spice in Ethiopia is scattered and fairly low yield is gained, this sector is yet has the potential to outperform by improving the value chain that benefits much share to the farmers and adjustments to marketing procedures. Besides, supplying improved varieties of spice suiting different agro-ecologies and collaborations with nearby agricultural research institutes, cash-crop orientation trainings to farmers, and digging out ample spice processing options with establishment of factories is a huge marginal investment benefiting all actors in the spice value chain of the country at large and accruing farmer specific benefit share from the sector (Hibistu, 2020).

A study by Goshme and Ayele (2019) reviewed factors affecting production of spices, and marketing of spices and opportunities of spices production in Ethiopia. The result showed that, traditional way of farming, absence of seeds and planting materials, high frequency of weeding, high input requirement, high input cost, lack of drying facility, taking long time to dry, shortage of access to credit and extension, different disease and pests, wild animal competition, poor quality of output, absence of proper post-harvest handling practices and others are factors affecting production of spices in Ethiopia.

The same study stated that low output price, poor market access and imperfect market information, capital constraints, limited processing of spices, adulteration, mismatch between demand and spices, transportation problems, unlicensed traders, theft, low government support, lack of value addition, price volatility, weak market research and promotion, poor market infrastructure, lack of effective linkage of stakeholders, lack of capacity building, low bargaining power of producers, limited ability

of producers to enter in market due to limited time, skill, and resources are some of the factors that affect spices marketing in Ethiopia. Moreover, Agize (2016) has attempted to fill some of the gaps in the information on marketing opportunities and constraints for spices that grow in South-West Ethiopia, specifically for Ethiopian cardamom, Ethiopian long pepper, Indian cardamom and black pepper. The results show a mixed image on marketing opportunities for spices. Ginger, Turmeric and Pepper are among the main spices produced and collected by the households during the study period. Regarding the marketing of spices, farmers and traders face low prices, difficulty of finding markets, long transport distances, a lack of capital for transport and extending production, a lack of market information and small volumes to sell.

Furthermore, a value chain study by Gobie (2019) stated that even though Ethiopia cultivates Pepper but its share in the world was insignificant. The Pepper sub-sector can be characterized as underdeveloped, unorganized, small scale, and inefficient. Furthermore, farmers output faced constraints such as lack of improved seeds to satisfy producers demand, lack of advice and technical assistance, non-timely distribution of fertilizer, which leads to delay in sowing and harvesting, traditional way of cultivating, lack of training for experts and shortage of manuals, publications and guidelines for spice production largely hinder the red pepper production.

The same study stated that the Red Pepper value chain suffers from low production, low quality, less value addition and irregularity of supply. The actors were input supplier, producer, merchant agent, processors, wholesaler, retailer, and consumer. These problems of low quality and quantity not only influence the international competitiveness of Ethiopian exporters but also the domestic market as well. The decline of red Pepper production is also attributed to poor varieties, poor cultural practices, and diseases. Gizachew et al. (2018) analyzed determinants of market supply of pepper among smallholder farmers in Wonberma district of west Gojjam zone of Amhara region. Using two stage sampling method, data was collected from 130 pepper producers, supported by secondary data. Multiple Linear Regression-2SLS is used to analyze factors affecting market supply of small holder Pepper producers. The result of 2SLS indicated that market supply of Pepper was significantly affected by quantity of pepper produced; pepper farming experience, one year lagged price and family size. The study finally underscores enhancing farmers bargaining power through cooperative; strengthen institutional services and infrastructure development for policy implication.

Furthermore, Mekdes et al. (2017) studied the market chain of Red Pepper at Abeshge District, Guragie Zone, South Ethiopia. The study has duly focused on the structure and conduct, market participants and performance of red pepper markets. The data were generated by structured questionnaire, focus group discussions, key informant interviews and field observation, supported by secondary data. Quantity of pepper passed through different marketing agents from farmers to consumers. The farmers-collectors-wholesalers-processors-consumers channel carried the largest volume, which is 35.7% of the total volume followed by farmers-wholesalers-processors-consumers channel, which carried about 27.6% of the total red pepper, marketed. Structure of pepper market indicates Four-Firm Concentration Ratio (CR4), that is, the share of the largest four traders in the total volume of pepper purchased. The four largest traders handled 35.32% of the total volume of purchased pepper.

In relation to the conduct of Pepper market, pricing mechanism of the farmers indicated that 13.3% of farmers set their selling price. Cheating was very common in pepper marketing by manipulating weighing scale and adulteration. Regarding payment strategy, about 74.7% of sample farmers sold their product on cash. Traders took a total of 61.3% out of the total profit margin. Red pepper producers added 38.7% of the total value of red Pepper in the Woreda. The Total Gross Marketing Margin is highest in farmers-

processors- consumers (62.1%) followed by farmers-retailer-processors-consumers (55.4%). The study finally suggested that the development of Pepper producers' bargaining power through cooperatives is the best measure that should target at reducing the oligopolistic market structure and increases pepper production in the Woreda's Pepper markets.

1.5.2 Value Chain Analyses of Spices

The major trends in the development of the Spices sub- Sector can be analyzed by both Global and Local trends in terms of spices Production, Consumption and Trade respectively.

A. Global Overview

i. Production

Global production of spices has shown a continuous increment from year to year across all regions and countries of the world. According to data from FAOSTAT, global spices production amounted to 10.8 million metric tons in 2013 and this has increased to 12.8 million metric tons in 2018. Other top producers include Indonesia, Thailand and Nepal. About 75% of global production is 'captive use' in the countries of origin. For example, India exports only about 15% of its production. Vietnam is the most prominent export oriented country and is responsible for approximately 40% of the global black pepper trade. China and India are the largest producers and consumers of spices, contributing 44% and 9% of global spice production, respectively.

Ginger and Pepper account for the largest amount of spices production and consumption. In 2019, the global production of ginger and pepper amounts to 4.5 and 1.2 million metric tons respectively. The total annual growth rate of ginger and pepper production from 2010 to 2019 was 5% and 10% respectively. Ethiopia, Vietnam, Brazil, Indonesia, India are the top five largest producer of pepper. Other top pepper producers include Tajikistan, Sri Lanka, China, Malaysia, and Mexico. In 2019, Ethiopia produces 32.8% of global pepper production followed by Vietnam with 23 percent.

In recent years, Ethiopia has shown remarkable progress in the production of Pepper. For example in 2010, the country produces 265,276 metric tons of pepper, which has grown to 322,655 and 425,395 metric tons in 2015 and 2016 with annual growth rate of 58 and 32 percent respectively. The following table shows top ten producers of pepper from 2010 to 2019. This is also supported by a figure showing the trend of global Pepper production from 1961 to 2019. For details, refer to Annex 4. India, Nigeria, China, Nepal and Indonesia are the top five largest producer of Ginger in the world. Other top ginger producers include Indonesia, Cameroon, Bangladesh, Japan, and Philippines. In 2019, India produces more than 39% of global Ginger production followed by Nigeria with 15 percent share of global Ginger production.

ii. Global Trade and Market Potential

The global market for spices has been growing steadily in recent years. The market has grown from a global value of US\$12.7 billion in 2012 to US\$16.6 billion at the end of 2019. By 2024, the market is expected to range from US\$19 billion to US\$21 billion, and to reach US\$25 billion by the end of 2026, growing at a compound annual growth rate (CAGR) of 6.3% from 2020 to 2027.

The increase in demand for these products is attributable to increasing buyers’ willingness to pay a premium for new flavors and ethnic tastes which in turn is fueling to the growth of the market. Furthermore, rising demand for ready-to-use spice mixes as convenient options in the food-service industry is expected to open new avenues for the market. Seasoning and spices have been witnessing a remarkable demand from the commercial and household sectors, due to not only their taste and flavor but also their associated health benefits.

The market for spices in Western economies, such as Europe and North America, will continue to grow, but will be slower than in other regions such as Asia, where general economic growth is higher and markets are expanding rapidly. Due to very limited European production potential, Europe is for the most part dependent on the import of spices, herbs and their extracts from emerging economies in the Asia-Pacific region, the Middle East and Africa. Asia-Pacific has the fastest growing spices market, with a projected annual growth rate of 6% from 2019 to 2021, reaching US\$3.27 billion by 2021. The food processing industry and the promotion of organic spice cultivation in Asia will be an important driver behind this growth. In Africa, the spices market is growing as well. Key drivers behind this growth are an expanding middle class and the upcoming tourism sector, combined with increased consumer awareness of the benefits of using spices and seasoning.

North America spice market has the largest market for spice extracts followed by Europe. Most of the EU countries like the UK and Germany do not have suitable agro-climatic conditions to cultivate most spices and herbs; hence, they depend heavily on imports from moderate or semi-tropical countries. The European region is known to be a global trading center for spice extracts, not only regarding imports from producing countries but also in trading among its members and other countries.

Developing countries are the major suppliers of global spices products. Because of their vast populations and spicy food traditions, India and China are the largest producers and consumers of spices, contributing 44% and 9% of global spice production, respectively. Other top producers include Indonesia, Thailand and Nepal. About 75% of global production is ‘captive use’ in the countries of origin. For example, India exports only about 15% of its production. Vietnam is the most prominent export oriented country and is responsible for approximately 40% of the global Pepper trade led by countries such as China, India and Vietnam.

According to the source of 360 Market Updates, the estimated value of spices in worldwide between 2019 1nd 2025 (USD Billion) is shown below:

Year	2019	2020	2021	2022	2023	2024	2025
Value	11.54	11.99	12.46	12.94	13.45	13.97	14.51

This statistic shows the value of the spices market worldwide from 2019 to 2025. In 2019, the global spices market was valued at about 11.5 billion U.S. dollars. The global market for spices is likely to witness a 3.89% annual growth rate from 2019 to 2025, expanding its valuation to about 14.5 billion U.S. dollars by the end of 2025.

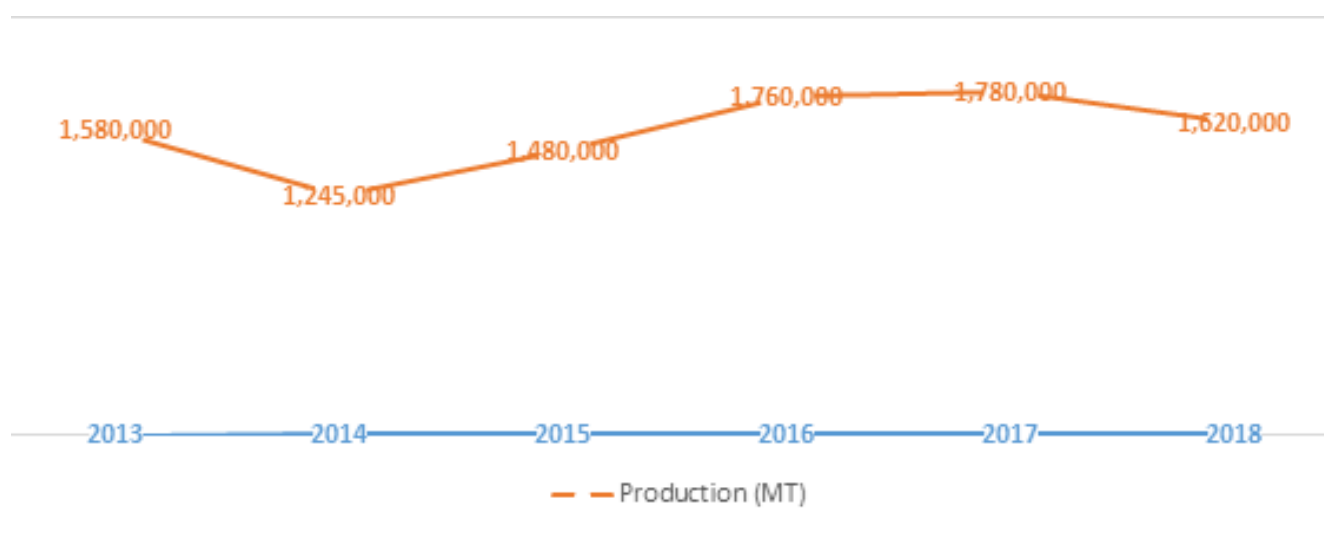
The increase in global market size for spice is marked by the expanding global consumption of spices with annual growth rate of between 3% and 5%. Globalization, growing population and the experiences of consumer preferences towards health benefits of spices have resulted in the growth of spices exports from surplus producing countries. Besides, the increased consumption of meat has had an increasing impact on the consumption of spices in those countries.

iii. Spices Production, Consumption and Trade in Africa

The production of spices in Africa has increased from time to time. For example, in 2013, the total production of spices in Africa amounted to 1.58 million MT and this has grown up to 1.62 million MT in 2018. In terms of global market share, African production has decreased from 15% to 13%. This is mainly due to a higher increase in the production of spices in other areas (especially Asia and Latin America).

The most common type of spices produced in Africa are dried chilies (57% of total produced volume), followed by ginger (29% of total produced volume). The production of dried chilies has increased substantially over the years with average annual growth rate of 3.4% in 2013–2018. However, the production of Ginger decreased (average annual growth rate of -4.2% in 2013–2018).

Figure 3: Trend of spices production in Africa (2013-2018)



Source: Adapted from FAOSTAT

iv. Spices Sector Development in Ethiopia

a) Production

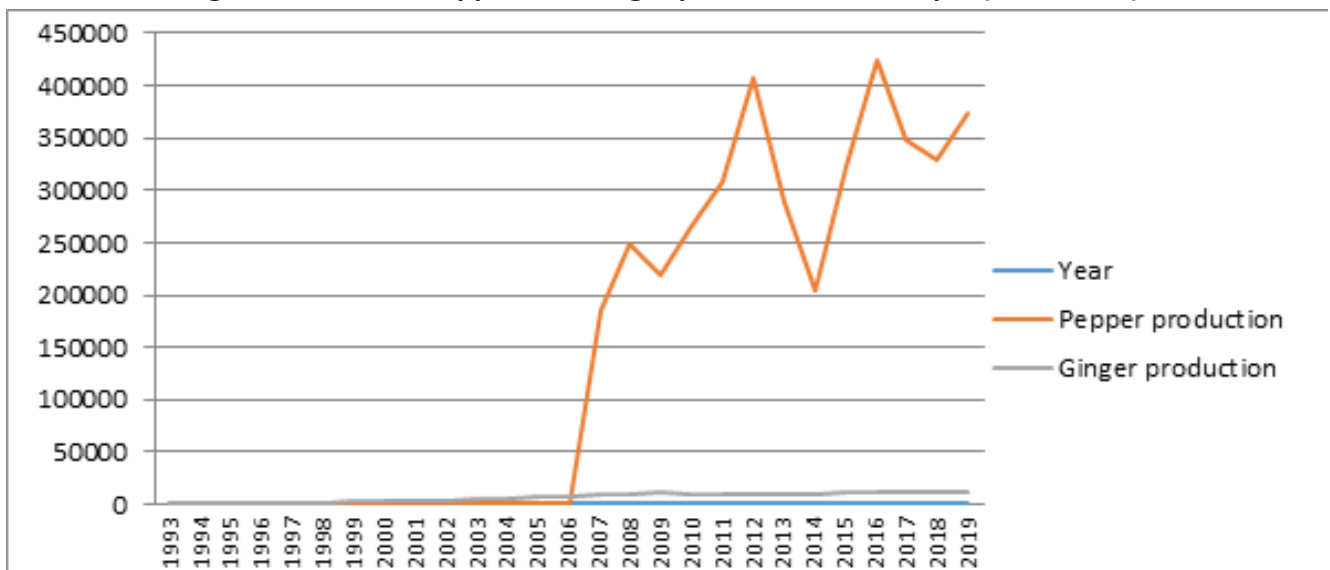
Ethiopia produces more than 50 spices from the 109 spices listed by the International Organization for Standardization (ISO). SNNPRS, Oromia and Amhara are the main spice-producing regions in the country. SNNPRS is the main producer of ginger, turmeric and black cardamom, primarily in Kaffa Zone, Bench Maji Zone and Gedeo Zone. Oromia Region (especially Illubabor Zone) and Amhara Region are chiefly responsible for the production of chilies and black cumin. According to a recent estimate, around 1.1 million households in Ethiopia are engaged in the farming of spices.

According to FAOSTAT data, total spice production in Ethiopia increased from 234,000 MT in 2013 to 356,000 MT in 2018, while the area under spice cultivation over the same period increased from 150,000 ha to 207,000 ha. Chilies (294,000 MT), Turmeric (39,000 MT), Ginger (11,000MT) and Black Pepper (4,000MT) are the main spices produced in Ethiopia. Chilli Pepper accounts for over 80% of total spice production. The share of Chilli Pepper is very high and has increased over the years since several diseases affected the production of Ginger in Ethiopia.

b) Pepper, Ginger and Turmeric

There has been observed very sluggish production of Pepper, Ginger and Turmeric products over the years 1993 to 2006. For example, from 1993 to 2006, only 1, 678 hectares of land was cultivated resulting in the average total production of 671 MT of pepper per year. But, from 2007 to 2019, there has been dramatic shift in the production of pepper in Ethiopia. From 2007 to 2019, the total area harvested for the purpose has increased to 133, 975MT resulting in an average total production of 301, 821 MT of pepper per year, which ranks Ethiopia the largest producer of pepper in the World followed by Vietnam , Brazil, Indonesia and India. The following graph indicates the trend of Pepper and Ginger production; areas harvested and yield per hectare from the year 1993 to 2019. There was no data available on the production of Turmeric in Ethiopia at the time of writing this report.

Figure 4: Trend of Pepper and Ginger production in Ethiopia (1993-2019)



Source: Compilation by using FAOSTAT Data

The above figure clearly shows that the production of ginger in Ethiopia remains insignificant over the years, while from 2007 onwards, the production of pepper has shown significant jump both in terms of the area harvested and productivity (yield per hectare).

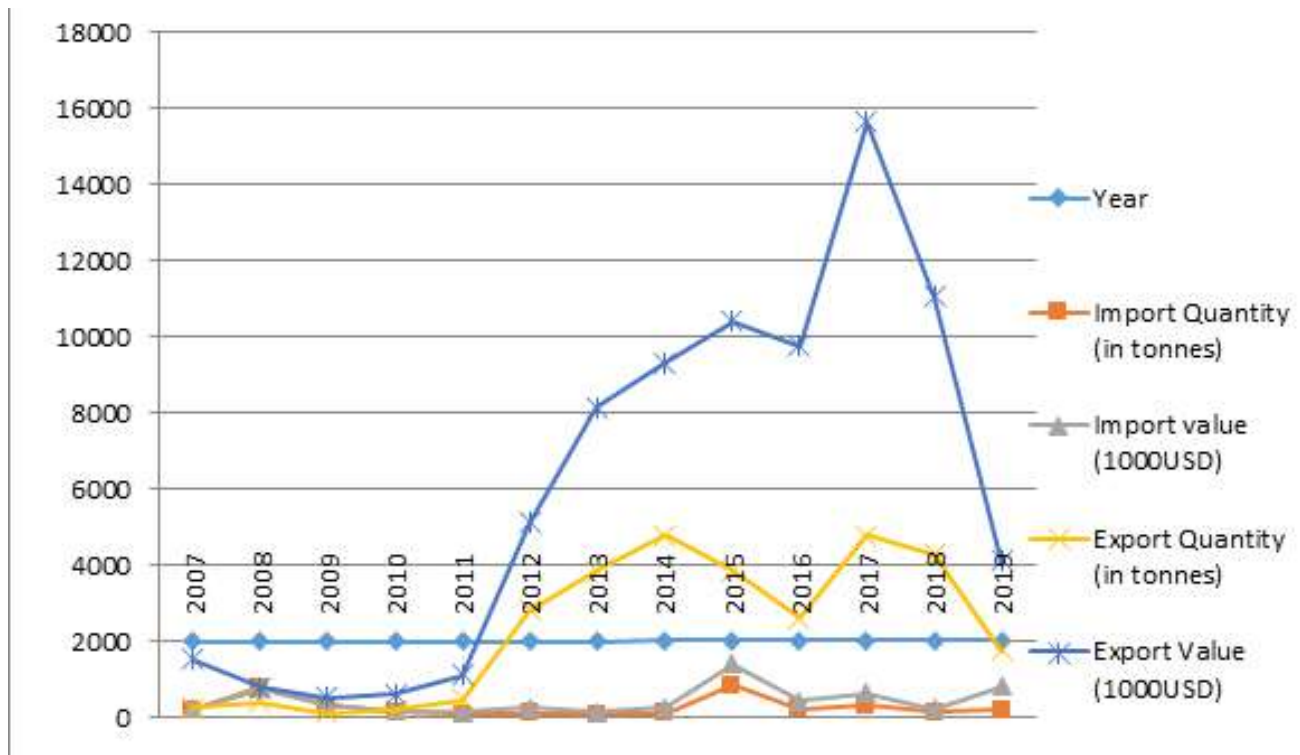
v. Spice Trade in Ethiopia

a) Trend of Pepper Imports and Exports

Between 1996 and 2010, pepper imports amounts to an average of 132 metric tons per annum, representing an average value of 139,000 USD per annum. From 2011 to 2019, imports of pepper have increased to an average quantity of 245 MT per annum representing an average value of 490,000USD per annum.

Similarly, between 1996 and 2010, Ethiopian pepper exports pepper amounted to an average of 213 metric tons per annum, representing an average value of 846, 400 USD per annum. From 2011 to 2019, its pepper exports have increased to an average quantity of 3, 251 MT per annum representing an average value of 8, 297,000USD per annum.

Figure 5: Trend of Import and Export of Pepper in Quantity and Value (2007/19)



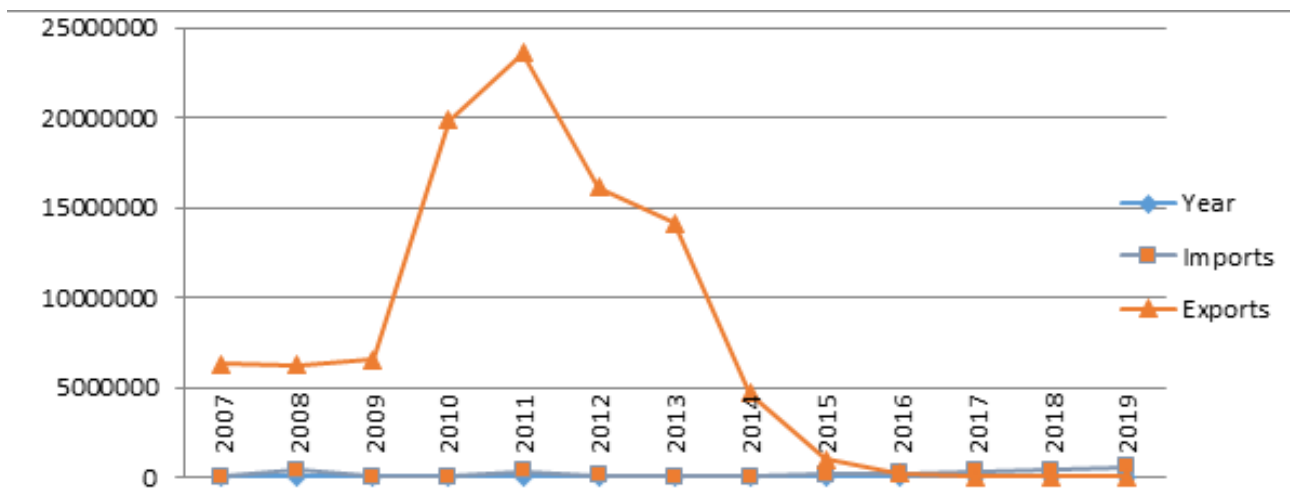
Source: Computation by using FAOSTATA Data

b) Trend of Ginger Imports and Exports

It is only recently that Ethiopia has started to import ginger. This is basically related to Ginger bacterial wilt which resulted in a significant loss both in qualitative and quantitative rhizome yield in Ethiopia. The following figure depicts this fact. Between 2007 and 2019, the country has imported an average of 156 MT of ginger per annum, representing an average value of 190,000USD per annum. To this contrast, up to 2013/2014, there has been a sharp increase in the export of Ginger in Ethiopia. Between 1998 to 2013, Ginger exports amounted to an average of 6,360 Metric tons per annum representing an average value of 7, 209, 000 USD per annum.

However, from 2014 onwards, there has been a sharp decline in the production and export of Ginger in Ethiopia. For instance, in 2014 Ginger exports amounted to 2,900 MT which further is declined to only 6 MT between 2018/19 with equivalent value of 7000USD per annum.

Figure 6: Trend of Ethiopian Ginger Exports and Imports (2007 – 2019)

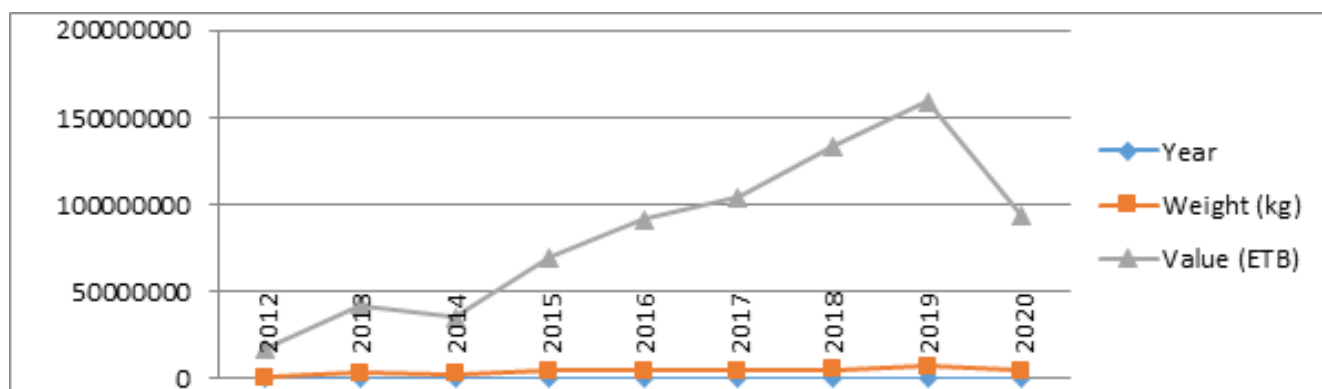


Source: Compilation by using FAOSTAT Data

c) Trend of Imports and Exports of Turmeric

There was no clear data available on the import of turmeric in Ethiopia. Various studies show that before 1972, Ethiopia was a turmeric-importing country, but because of the suitability of its southern humid regions, turmeric is now widely grown in Ethiopia and the country has become an exporter. According to the data from Ministry of Trade and Industry of Ethiopia, from 2012 to 2016, the value of exported Turmeric from Ethiopia was found to be 3,413 metric tons with equivalent monetary value of 51,420ETB per annum. From 2017 to 2020, the export of turmeric from Ethiopia almost doubled reaching an average of 5, 500 MT per annum. By 2017, Ethiopia had become the fifth leading country in terms of turmeric export value. This is mainly explained by the fact that, following the impact that disease had on Ginger crops in 2014, farmers shifted to the production of Turmeric. But after Ginger production started to recover, the production of Turmeric starts to decline. This evidenced by a sharp decline of Turmeric production and export from 2018/19 onwards.

Figure 7: Trend of Turmeric Exports in Ethiopia (2012-2020)



Source: Authors compilation using FAOSTAT data

1.6 Value Chain Analyses of Ginger, Pepper and Turmeric

A. Ginger

i. Value Chain Actors and their Functions

Major functions involved in the Ginger production can be described at: farmer's level, traders' level and processors level. These are input supply, production, local processing at farmers level; collection, domestic trading, exporting at traders level; as well as processing and manufacturing for value addition at national processors level. The function of final processing and manufacturing is limited form in Ethiopia. In a value chain, the actors include the value chain operators and the operational service providers and influencers together. Those functionaries who are directly involved in transaction or directly support the actors involved in transaction are the value chain actors. Based on activities performed, the actors are classified as follows:

Input Suppliers: provide inputs for the production of ginger. Agricultural offices, cooperatives/union, model farmers and private dealers provide seed and fertilizers. Government and NGOs provide technical support to equip them with the necessary skills and provide inputs to the farmers; however, the flow of information and inputs is not that much satisfactory.

Farmers: refers to a person or his/her family members who have been growing and selling Ginger products. There are three types of farmers, who are engaged in the Ginger production. These are: i) small farmers with subsistence ginger production, ii) small commercial farmers characterized by small production volume but still targeting the market, and iii) large scale commercial producers. Farmers are also engaged in local processing of spices, such as drying and washing.

Local Intermediaries: These are brokers involved at different stages in the supply chain during the purchase and selling processes from farm to terminal markets.

Local Processors: Ginger is locally processed by washing and drying. The processing is done by the farmers themselves using traditional techniques before it is sold to either local traders, wholesalers or national traders. More than 75% of the production is sold as fresh, and the remaining is sold in dried forms. Washed Ginger has been prepared by local cooperatives in a very little quantity and exported through their unions as well as private commercial farming companies (Tadesse and Asfaw, 2015).

Wholesalers and/or Suppliers: are defined as those who sell the goods to suppliers, retailers, hotels, industries, and institutional users. Wholesalers are those traders located at woreda and zone level and sometimes even in rural towns, who collect ginger directly from farmers. Wholesalers usually emerge from the local community and sometimes outside, and perform trading of spices. Ginger is collected and stored until the amount reaches the load of trucks. Sorting to some extent, such as removing the decayed and spoiled ginger, is done at this level. Most of the ginger from wholesaler traders is supplied to exporters who primarily send to various market destinations. Some quantity of the ginger also goes to retailers for local consumption. They also actively participate in trade of ginger and its products at national market. They get Ginger from wholesalers and then sell it to the national market, national level processors and exporters. Sometimes it is common that national traders provide Ginger directly to the neighboring countries.

National Processors: The firms which are engaged in producing ginger and other products using ginger as one of the ingredients are termed as national processors. It is evident from various sources of information that ginger oleoresin essential oil, and slices have been exported to Japan, US and EU markets from national level processors.

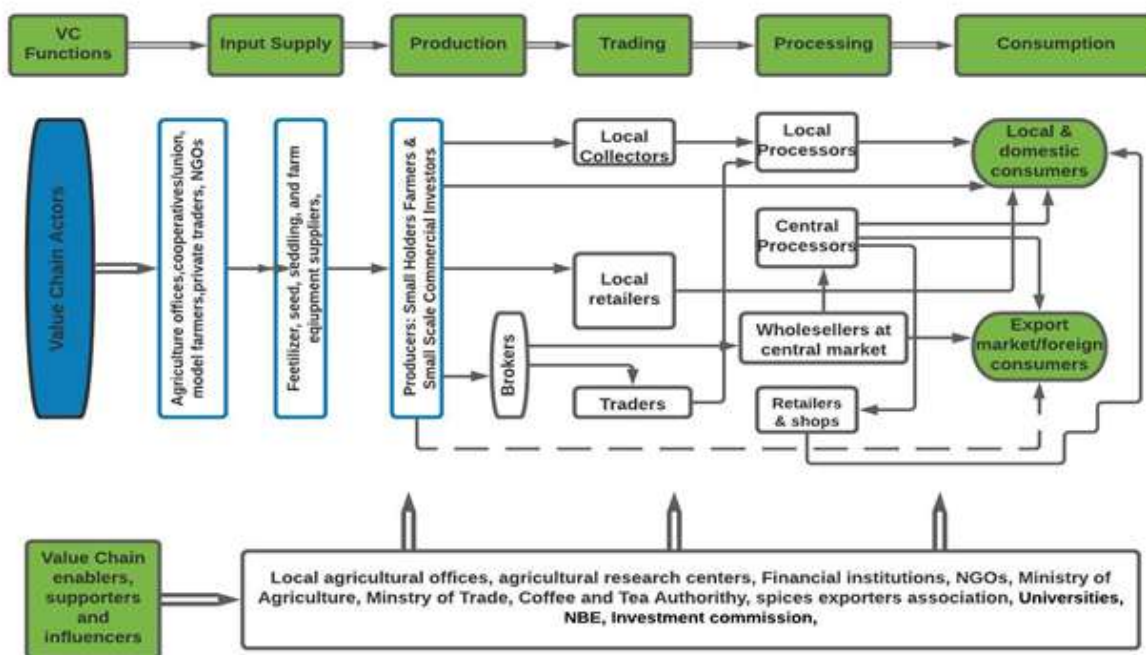
Exporters: The firms which are engaged in export business of ginger and its products are regarded as exporters. The majority of the dried Ginger goes to different foreign market destinations, while very small amount of Ginger products are exported to niche- market of USA, EU and Japan.

Retailers and Shops: Retailers are those traders who purchase the ginger products from wholesalers and sell back to the final consumers.

ii. Value Chain Map

Mapping the value chain of Ginger facilitates a clear understanding of the sequence of activities and the key actors and their relationships involved in the value chain. Major functions include input supply, production, trading, processing and consumption.

Figure 8: Value Chain Map of Ginger



iii. Market Channels

The market channel of Ginger represents a business structure of interdependent organizations/actors that originates from the point of product origin to the consumer with the purpose of moving ginger product to its final consumption destination. The identification of market channels helps to comprehend the alternative routes ginger follows from its origin to consumption. As a result, ten alternative marketing channels are identified for Ginger, indicated as follows:

Channe 11: Farmers → Consumers

Channe 12: Farmers → Local Collectors → Local Processors → Local and domestic consumers

Channe 13: Farmers → Local Retailers/Vendors/ → Local Consumers

Channe 14: Farmers → Brokers → Traders → Local Processors → Local and domestic consumers

Channe 15: Farmers → Brokers → Traders → Central Processors → Export market/foreign consumers

Channe 16: Farmers → Brokers → Traders → Central Processors → Retailers and shops → Local and domestic consumers

Channe 17: Farmers → Brokers →Wholesalers at central market → Central Processors → Retailers and shops → Local and domestic consumers

Channe 18: Farmers → Brokers →Wholesalers at central market →Central Processors → Retailers and shops → Export market/foreign consumers

Channe 19: Small Scale Commercial Investors → Brokers →Wholesalers at central market → Central Processors → Retailers and shops → Export market/foreign consumers

Channel 10: Small Scale Commercial Investors → Brokers →Wholesalers at central market → Central Processors → Retailers and shops → Local and domestic consumers

iv. Production and Market Conduct

Many years ago, Ginger production in Ethiopia was restricted to a home garden using local cultivators at the level of small-holder farmers to be used for household consumption and/or for small local trading. Nowadays, farmers in some parts of the country, particularly in SNNP, have been engaged in large scale commercial production. Majority of ginger production areas in the country like Hadaro in Kembata Tembaro zone is a key assembly center of ginger. There are other market places such as Shinshicho, Mudula and Tunto in Kembata Tembaro zone; of those the Shinshicho market place is important for fresh ginger collection. Similarly, in Wolaita zone, Areka marketplace is a key assembly center.

In Hadaro town, there were registered local collectors who buy dried ginger from farmers and small-scale collectors and sell in bulk to buyers in Addis Ababa. Farmers engaged in selling small amount of ginger simply to get some money for their daily necessities. There are small-scale collectors who buy those small-heaps of dried Ginger to collect in bulk/large volume.

The processing work in ginger is sorting, cleaning and drying. This is known as first level processing in practice using machinery. Drying practice of ginger, however, is not recommended because it affects Ginger's quality. This is because much of the ginger produce in the region is affected by the disease and, drying decreases the kilo and volume of Ginger. The volume or kilo will significantly decrease because of drying.

Producers of Ginger lack appropriate skill, knowledge and information on ginger marketing and are compelled to sell their produce at relatively low price. On the other hand, farmers have very little stake over the value chain, and the system is mainly operated by the middlemen, wholesalers, suppliers, retailers and cooperatives, who have better access to market information. Hence, the backward flow of market information is managed in favor of these stakeholders. Furthermore, the product is exported to neighboring countries without any value addition. Moreover, the farmers are not aware of Ginger market and value chain information including price at the end markets, demand situation, quality etc. As a result, the production (supply) is not planned according to the demand situation and hence oversupply/short-supply often results in unstable price and losses in business.

Marketplaces in major production areas play a role in gathering farm products, and function as a starting point of distribution to urban markets. However, basic market infrastructure such as market places and warehouses are still in poor condition in the country. These undesirable conditions prevent utilization of the existing high production potential. This problem calls for improving market places as they are basic infrastructures.

In reality, there is no proper linkage between Ginger production, processing and marketing in Ethiopia. The government is not doing what is expected to do first by putting the right and clear policy and strategic guide to the farmers and all involved in the value chain because of this the government is not benefiting from the sub sector as expected as well.

Ginger producing belt of Ethiopia is very small area located in SNNPRS Regional states in the South West part of the region: Western part of Kembata Tembaroo, North Wolaiyta, Eastern part of Qawerro, Western part of Hadiya. These areas form what we call the Ginger Belt of Ethiopia. In the Northern part of Ethiopia, some areas of Amhara (North Amhara-Chilega) and Oromia (Western Oromia) regional states are also producers of Ginger.

Nevertheless, the country has not benefit from the sub sector as such because it doesn't produce adequate quantity and quality for its export. It has very few destinations for export, because the country is exporting Ginger without proper first level processing works, and it is not fulfilling the European and American International quality standard requirements.

In the marketing process of ginger, there was a practice called Trade Acrobat. This is a practice in which the traders, instead of supplying the ginger to the central market, they directly sell it to external markets (such as Sudan market, for example,) and earn the dollar for themselves directly. The Ethiopian government did not get the dollar.

In the Ginger Belt of Ethiopia, Ginger is a cash crop and the main source of income generating activities. Ginger is the main sources of income for the farmers and..." it is everything for the farmers". Six and seven years back, farmers could produce 320 quintals of ginger per hectare. After the Ginger bacterial disease occurrence the farmers replaced Ginger with other plants including Turmeric. After repeated planting of other agricultural products, application of crop rotation and mixed farming techniques, on average 180-160 quintals of ginger per hectare could be produced. Once the impact of the bacterial disease decreased, the farmers started replanting Ginger using irrigation.

When Ginger bacterial disease occurred, farmers have been burying the ginger under the soil and wherever they found it a secured place to protect the ginger seeds for the future in their storage. Ginger production come back to the farm land after couple of years, credited to the wise farmers who kept the ginger seed for the future.

It was stated that when Ginger is stored for long period, the weight of ginger decline. Ginger production will be ready for extraction and supply to the market within 9 months. Farmers could also keep it in the soil for more periods depending up on the market conditions and their expectations. The longer the ginger stayed there would be much higher fiber in it which decreases its quality. This indicates that production improvement matters a lot in ginger value chain.

FARM Africa was active in organizing the primary farmers in to cooperatives and providing technical and training support to improve the livelihood of the farmers. It has created better awareness on the production of better quality agricultural products. It also trained the farmers on how to improve the farm land productivity, how to enhance farmers labor productivities through training and improving farming methods through fertilizers etc. Now, Farm Africa is closing its office in areas such as Hadaro in SNNPRS, one of areas in the Ginger Belt of the country.

Fresh Ginger is relatively expensive in the market though there is weak or no proper market linkage. The prices get costly for the farmers to use more fertilizers which in turn make their product more expensive. For example, around Areka in 2019, one quintal of ginger was sold at 6,000 birr. In 2020, one quintal was sold down to Birr 1,650 and this year in 2021, 1 Quintal of Ginger is sold for about Birr 2,000.

- Revenue from a Hectare of Ginger land per annum estimated to be Birr 700,000
- Total Inputs Costs: Seeds, Fertilizers, labor force is estimated to be Birr 320,000
- Gross profit is estimated to be Birr 300,000 to 400,000

In Hadya zone of the SNNPRS, there is a medium scale commercial farming project, which uses irrigation and produces Pepper, Onion, Ginger, Mango and potato for the markets in Hossana, Oromiya region and Addis Ababa. In this farming, 400 quintals of ginger is expected to be produced from 2 hectares of land by the month of September. It uses 40 quintals of ginger seeds for this 2 hectare ginger farm land because a hectare land takes 20 quintal ginger seeds. A quintal ginger inputs costs 3,500 Birr, and 40 quintals of ginger seed costs a total of Birr 140,000 , including all labor, transport costs because it is a bulk purchase entitled to discount. Estimated total sales at the current market selling prices of ginger Birr 2,500 will be Birr 1 million. At the time of the survey, the current retail market price of Ginger in Hosanna shops is Birr 60 per one Kilo that means Birr 6,000 per quintal. As a result, the project is entitled to a Gross Profit of Birr 860,000.

In most of the cases, the collectors, brokers and middlemen work in the areas without any major investment and work without their own financial resources (they buy and “...sale air by air” and determine the market prices and get as commission or their shares. In nutshell, the middlemen are benefiting from the marketing system they are operating in because most of them are not licensed or operating illegally. There are no mechanisms to regulate the business of Ginger.

According to a Ginger collector and trader in SNNPR, the benefit from the market for Ginger depends on the condition of ginger supply at the market. The collector and trader collect Ginger from the farmers directly. In the Ginger production areas, it is possible to find an individual working as a farmer and collector. He is playing both roles as farmer holding his own land and planting Ginger. He also works as a collector and sells the product to larger markets at a better price.

On the other hand, the Team has observed that there are no Farmers' Cooperatives on Ginger in Areka town, in SNNPRS. In the area, there is a one-day market per week. There is no standard marketing center. Because of this, collectors and middlemen collect and transport to other towns. There are small scale ginger processors in Ginger production areas. Medium scale Ginger processing have started operating in the area by the private sector, but it could not be sustained due to the nationwide Ginger bacterial disease happened since 2012.

B. Pepper

i. Value Chain Actors and their Functions

The various functionaries who are directly involved in transaction or directly support the actors involved in transaction are the value chain actors. Based on activities performed, the actors are classified as follows:

Input suppliers: are those who provide inputs for the production of pepper. Seed and fertilizers are provided by agricultural offices, cooperatives/union, and private dealers. Government and non-governmental agencies provide technical support to equip them with the necessary skills and also provide inputs to the farmers; however, the flow of information and inputs is not that much satisfactory. For example, there is union at Alaba called Mencheno, which is working on pepper, with 57 primary cooperatives as member. The union provides its members with seeds, fertilize and chemicals. It also provides loan to its members. Its source of finance for the loan is banks and members' savings/contributions.

Farmers: They refer to a person or his/her family members who have been growing and selling pepper products. Most of the yield from small farmers and small commercial farmers are sold to various market segments. Farmers are also engaged in local processing of pepper, such as drying and washing.

Local intermediaries: These are brokers involved at different stages in the supply chain during the purchase and selling processes from farm to terminal markets.

Cooperatives: The union at Alaba serves the farmers by creating market linkages. It collects members' products and supplies it to the market a better price with negotiation. The union sells the collected pepper to different organizations, government offices (such as Universities). It also supplies directly to Addis Ababa market, to regions, exhibitions and federal purchasers. The union at Alaba, for example, provides annually around 150 quintals of pepper on bazaar and exhibitions.

Processors: The processing of Pepper locally can be done by the farmers themselves using traditional techniques before it is sold to either local traders, wholesalers or national traders. There are also local processors called BATINA and also processors at national level.

Wholesalers: These are defined as those who sell the goods to suppliers, retailers, hotels, industries, and institutional users. Wholesalers are those traders located at Woreda and zone level and sometimes even in rural towns, who collect pepper directly from farmers. Wholesalers usually emerge from the local community and sometimes outside, and perform trading various agricultural products.

Traders: These are traders who have been actively participating in trade of pepper and its products at national market. They get pepper from wholesalers and then sell it to the national market, national level processors and exporters.

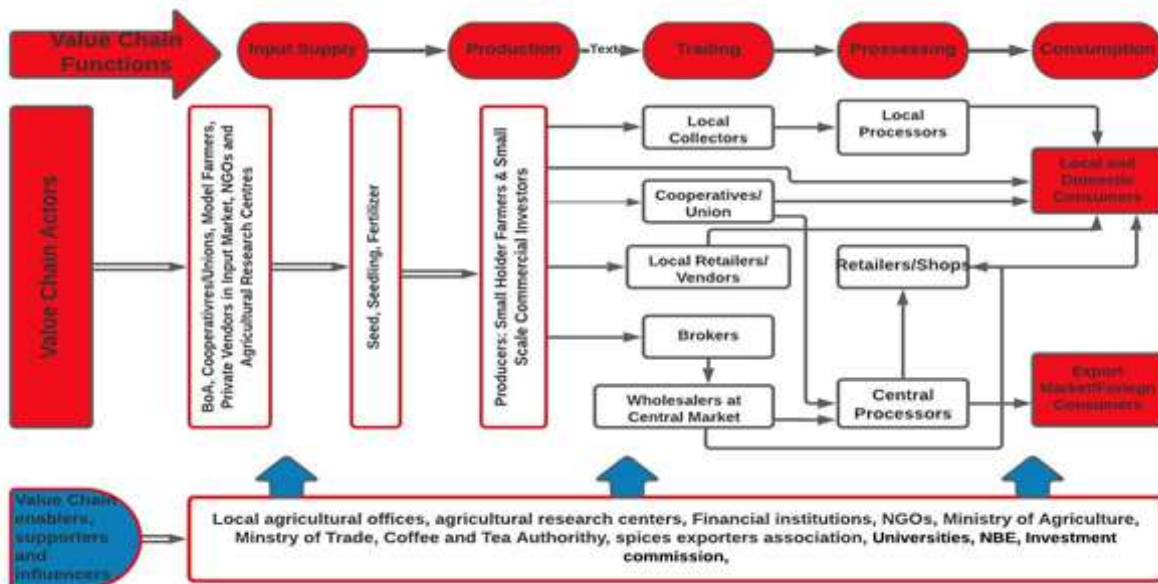
Exporters: The firms which are engaged in export business of Pepper and its products are regarded as exporters. Though majority of the Pepper consumed domestically, a very small amount of pepper is exported to other countries.

Retailers: They are traders who purchase the Pepper products from wholesalers and sell back to the final consumers.

ii. Value Chain Map

The value chain map of Peeper which incorporates all actors involved through the whole chain is illustrated below.

Figure 9: Value Chain Map of Pepper



iii. Market Channels

The main marketing channels identified from production point of pepper to the final consumers through various intermediaries or middlemen are listed and briefly explained below:

Channel 1: Farmers → Local and domestic consumers

Channel 2: Farmers → Local Collectors → Local Processors → Local and Domestic Consumers

Channel 3: Farmers → Cooperatives/Union → Local and domestic consumers

Channel 4: Farmers → Cooperatives/Union → Central processors → Export market/foreign consumers

- Channel 5:** Farmers → Cooperatives/Union → Central processors → Retailers/Shops → Local/domestic consumers
- Channel 6:** Farmers → Local Vendors → Local and domestic consumers
- Channel 7:** Farmers → Brokers → Wholesalers at central market → Central Processors → Export market/foreign consumers
- Channel 8:** Small Scale Commercial Investors → Wholesalers at central market → Central processors → Export market/foreign consumers
- Channel 9:** Small Scale Commercial Investors → Brokers → Wholesalers at central market → Central processors → Export market/foreign consumers
- Channel 10:** Small Scale Commercial Investors → Brokers → Wholesalers at central market → Retailers → Central processors → Export market/foreign consumers
- Channel 11:** Small Scale Commercial Investor → Brokers → Wholesalers at central market → Central processors → Retailers/Shops → Local and domestic consumers

iv. Production and Market Conduct

Pepper is widely cultivated in different agro-ecologies of Ethiopia. Pepper is a major spice and vegetable crop produced by the majority of farmers in SNNP, Oromia, and Amhara regions. Despite the significance of pepper in Ethiopian economy and current income generating capacity of pepper for the smallholder producers as compared to its magnificent potential in the country, it has not been given due attention. Alaba in SNNPRS is known for its pepper production in the country. Traders, collectors and retailers purchase pepper from Alaba. Pepper production and distribution was good so far, but nowadays it is facing challenges in terms of lack of quality seeds. Still now, all pepper producers and agricultural agents demand seed from Alaba. The demand for pepper seed also comes from irrigation agents and universities.

The producers of pepper provide their pepper produce to the local market here at Alaba. Based on the volume, they sell it to the wholesalers or retailers directly. Finally, the wholesalers transport it to Mekelle, Addis Ababa, Gondar and other potential markets in the country. With the support of Farm Africa, farmers were able to establish their own association and supply their products to large markets and exhibitions. This helps to bring more recognition for their product and enhance the market linkage. It also brings more demand for pepper through the linkage that they have created.

Across the country, Pepper is being attacked by a disease called Fuzarium. The disease occurs during rain and also caused by infected seeds, which is the additional side effect of lack of improved seed. Farmers also purchase seed from the market directly, which is potential source of the disease mentioned above. With these all challenges, however, Alaba remains the major producer of pepper in the country.

In Alaba, there are two species of Pepper called Mareko Fana and Local Alaba (Alabicho). Alabicho has greater demand than Mareko Fana in the market. Mareko Fana has bold color, wider in size and shorter in height. Alabicho is a bit longer, and hotter (spicier) when eaten. It has greater burning or

biting sensation. Households and hotels prefer Alabicho to Mareko Fana because it is so spicy and effective. The other quality of Alabicho is it can stay for longer period of time after grinding, while the Mareko Fana changes its color to Shiro if we put it for longer period. The consumers, therefore, demand the Alaba Local Pepper.

Now, the market linkage for Pepper is improving and its price is increasing. This is because of the decrease in the production of pepper and also when Pepper production faces challenge in other parts of the country. Still, there is favorable demand for Alabicho than pepper from other regions of the country.

Farmers have their own traditional way of storing their pepper production. They know how to keep it safely with no damage for longer period of time. They store pepper individually, but collectors store it in a large store ventilated well. No processors or factories are operating currently around Alaba on Pepper. There are only the small local processors called BALTINA. There are no actors except the local collectors and sometimes brokers.

There are brokers between the large producers and collectors of pepper in the region. The price is fixed by the collectors/traders. The producers have no role over the price of pepper. In collaboration with Hawassa University, Farm Africa was disseminating market information (mainly price) to farmers through SMS application. Still, the farmers don't have the power to influence the price. It is against to this lack of power over the price that the farmers are powering water on to the pepper to give more weight to the pepper sold. This, however, will compromise the quality of pepper and create SHAGATA. Again, the farmer is forced to sell the pepper at the given price with no power. Because, if it is returned back to home, it will be useless since water is already powered on it.

Besides, there is bad practice of mixing the best quality with the poor quality pepper by the collectors and supply that to the market in order to increase the price margin. The price of pepper is highly variable, in which it becomes so cheap one week and expensive another week.

If the farmers use irrigation and apply fertilizer properly together with the proper follow up, they can produce on average 16 quintals of pepper per hectare. If not, production could decrease to 6 or 8 quintals of Pepper per hectare.

Pepper production is sensitive in that it can be damaged during rain, and easily exposed to disease. Pepper production requires fertilizer such as DAP and UREA. Farmers ratio of use of DAP and UREA is random since it is not supported by knowledge. Farmers' fertilizer usage practice around Alaba is out of the recommended ratio. The maximum fertilizer usage practice per hectare is 2 quintals of DAP and 2 quintals of UREA. Farmers with less capacity also apply 1 quintal of DAP and 1.5 quintals of UREA per hectare. The recommended dose of fertilizer is 2 quintals of DAP and 1.5 quintals of UREA. The farmers, however, usually apply increased combination of the fertilizers with the hope of producing more pepper.

The price of a quintal of DAP/UREA is between Birr 1500 and Birr 1600 . The annual revenue of the farmer depends on the market situation because the price is usually dynamic and unpredictable. The price is volatile. A kilo of pepper was sold for at a price of 170 Birr, and increased to 200 Birr. It has risen for example today to 260 birr per kilo. When there is good production, the price could decrease to Birr 50 or Birr 60 per Kg. As the supply from the farmers decrease, the price will begin to rise. This is because farmers have a practice of gathering market information such as price and production and supply in the

market so that they adjust their supply. The average selling price of Pepper per Quintal is Birr 22,000 and per Kg it is about Birr 220.

There is a Cooperatives Union in Alaba working on the collection and marketing of pepper. Pepper price received by members is determined by the cooperative/union that carried out market assessment through its marketing experts. The union is so strong that the traders can't break this network and influence the price. It is only when the union and cooperatives face cash shortage that the traders could get advantage and intervene in the market price.

The Union doesn't sell its Pepper to local traders, inhibiting them from supplying it to Addis Ababa market. It can only sell to its selected customers (Universities, WFP and government offices) on bulk basis at favorable price because it provides high quality pepper. The union is, however, standby to sell its product if it is offered with better price from any purchaser. On the other hand, traders do not want to purchase all their pepper need from the cooperatives/union, firstly because the union's price is greater. In addition, the traders want to purchase the poor quality Pepper from the local market at lower price and mix it with the good quality pepper in order to gain advantage in the market.

Finally, the farmers in Alaba have shown good progress because of the various supports provided by FARM Africa and Hawassa University to change the traditional farming methods. They provided them awareness creation trainings, training on cultivation, selection, and use of selected seeds varieties, improving market linkages etc in the whole Pepper value chain.

C. Turmeric

i. Value Chain Actors and their Functions

The value chain actors include those agents who are directly involved in the production and transaction of turmeric or directly support the actors involved in transaction. The major actors are:

Input suppliers: are those who provide inputs for the production of turmeric. The government through agricultural offices and cooperatives/union mainly provides seed and fertilizers.

Producers: refers to a person or his/her family members who have been growing and selling turmeric. Most of the yield from small farmers is sold in local markets.

Local intermediaries: These include local collectors, traders/vendors who purchase turmeric from the farmers in the local market and sell it to the local community, local processors or central processors.

Processors: Processing of pepper locally can be done by the farmers themselves using traditional techniques before it is sold to either local traders, wholesalers or national traders. There are also local processors called BATINA and also processors at national level.

Wholesalers: are defined as those who sell turmeric to suppliers at the central market, retailers, hotels, industries, and institutional users. Wholesalers are those traders located at Woreda and zone level and sometimes even in rural towns. Wholesalers could emerge from the local community and sometimes outside, and perform trading of turmeric.

Traders: are traders who have been actively participating in trade of turmeric and its products at national market. They get turmeric from wholesalers and/or central processors and then sell it to the national market, national level processors and exporters.

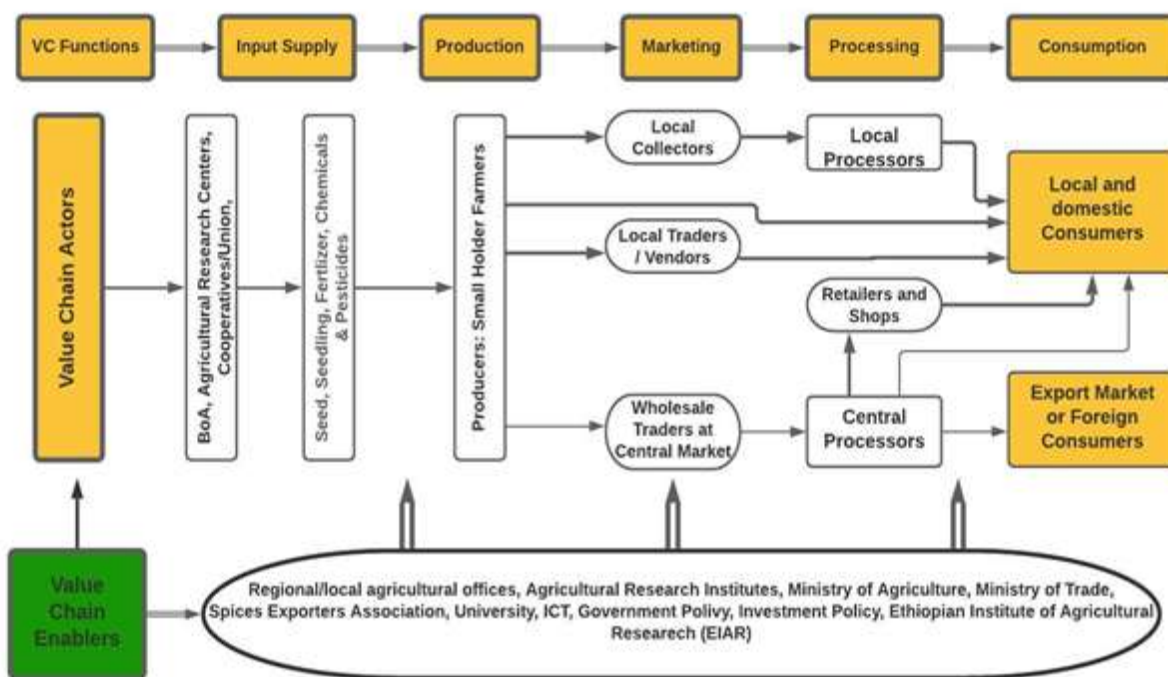
Exporters: The firms which are engaged in export business of turmeric and its products are regarded as exporters. Though majority of the turmeric consumed domestically, a very small amount of pepper is exported to other countries.

Retailers and Shops: Retailers are those traders who purchase the turmeric and its derivatives from wholesalers and central processors and sell it to the final consumers.

ii. Value Chain Map

The map includes the whole actors involved in the value chains and their connections that ultimately help the product reach to the final consumers. These are shown in the Figure below.

Figure 10: Value Chain Map of Turmeric



Note: Bold arrow represents better or stronger chain/linkage, while the thin arrow refers to poor chain/linkage among the actors in the value chain.

iii. Market Channels of Turmeric

Channel 1: Farmers → Local and domestic consumers

Channel 2: Farmers → Local Collectors → Local processors → Local and domestic consumers

Channel 3: Farmers → Local traders/vendors/ → Local and domestic consumers

Channel 4: Farmers → Wholesale Traders at central market → Central processors → Export/
Foreign Consumers

Channel 5: Farmers → Wholesale traders at central market → central processors → Retailers
and shops → Local and domestic consumers

iv. Production and Market Conduct of Turmeric

Ginger and turmeric has similar conditions of farming. The production and processing works are immensely laborious. In order to maintain the quality of the turmeric product after harvesting, applying good post-harvest practices is very important. Processing turmeric product is also highly laborious because the farmers should boil the turmeric for some times to change the color of turmeric, which requires additional labor and woods for boiling fire. The farmers found it cumbersome and costly process. Farmers supply small volumes, which are far below from the expected tones. Because of the tiresome and cumbersome process involved, the farmers could not able to add values in their turmeric products. The farmers' cooperative approach could be the viable option to add value of turmeric and prepare lager volume for exports.

Farmers used to plant turmeric especially when Ginger bacterial disease wide spread and became out of the market due to the bacterial disease, example in Hadaro, SNNPRS. However, the farmers were getting lower prices than Ginger products and it was not encouraging for them to continue with Turmeric in the area though the eco agriculture is suitable for both in some surrounding areas. In general, there was not large scale farming and production of Turmeric in Hadaro. There are individuals engaged in the collection and sale of turmeric products, for instance in Teppi, SNNPRS. The turmeric business is not a large scale. In this area, the individuals purchase dry turmeric from the farmers and sale it to the traders coming from other towns. They buy a kilo of turmeric at 30 Birr, which means one quintal at 3,000 Birr. The farmers' sale the lion share of the turmeric output to the local markets. The selling prices of turmeric received by farmers fluctuate most of the time.

Turmeric has been growing in Hadaro and Bombe areas, SNNPRS, by bringing the seeds variety from Mizan-Teppi Agricultural Research Institute, and production was relatively good. Sometime before, the farmers were happy to grow turmeric because it was claimed that producing turmeric would make the farmers beneficial because a kilo of turmeric would be sold at 100 Birr. FARM Africa had tried to link them with exporters. Generally, with no value addition; turmeric is being sold by the farmers at a price of 35-40 Birr per kilogram without any processing. Mostly, prices of turmeric are determined depending on the market conditions.

The survey from Mizan Teppi Agricultural Research Institute stated that Western Ethiopia is agro-economically rich with natural potential that needs to be exploited. Especially, the four Woredas: Sheko, Keffa, Sheka and Western Wellega are highly suitable for turmeric production. The KII also revealed that up to 2008 the production of Turmeric was increasing and encouraging but after 2009 it started declining because of lack of market access for the farmers and the influence of middlemen in determining the turmeric process of their own advantages. In addition, the farmers are forced to change the turmeric farming to other cash crops since the prices of turmeric are declining continuously. The farmers have no beneficial markets for their products, and there is no proper marketing system and no monitoring and regulation of the turmeric value chain.

Around Teppi, farmers directly supply their turmeric and other agricultural products to the limited intermediaries (2-4) who monopolized the market. The middlemen/traders determine the prices and the farmers sell turmeric and other products at lower prices. Because of this, the farmers are changing their farms from turmeric to other cash crops. Also, turmeric is sold by farmers at low price because most of the farmers do not store it for long period of time and sell at harvesting time. In turmeric value chain, there is very weak linkage among stakeholders including farmers, traders, processors and meso-level support institutions and macro level regulatory and enforcement institutions. There is a big disconnect or gap between producers, traders and processors. Smallholder farmers are generally not aware of the requirements of international markets. Local collectors and traders predominantly grade products according to primary sensorial aspects (size, colour and moisture), so there is no incentive for smallholder farmers to adopt international requirements. Educational levels, information asymmetry and the significant size of domestic/regional markets also contribute to the fact that international norms remain an extremely abstract concept for smallholder farmers. In terms of availability, there is huge potential and high amount of turmeric product is available. But, when we see the quality of the product is big problem and producers don't give much value for quality because there is no standard and cost difference between high quality and low quality products. With regard to value addition, there is low or no value addition along value chain on spices. In Teppi region, what is the total land size allotted for production of turmeric is 6926 hectares of land. Annual production of turmeric on average is 436,149 quintals. Even though the government provides fertilizer and the use of fertilizer is recommended, using fertilizer on turmeric production is not common in the region.

1.7 Key Findings from the Qualitative Thematic Areas (KIIs)

The information collected through interviews and discussions with Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) both at the federal, regional and lower levels during the field visits are found good bases for qualitative data analysis and recommendations based up on key thematic areas. The bases for the qualitative data analysis are the 7-10 thematic areas identified and put forward for respondents. In total 23 and 12 participants in KIIs and FGDs were conducted respectively. Some of the KIIs include the Ministry of Agriculture (MoA), Ministry of Trade and Industry (MoTI), International Growth Corporation (IGC), Federal Micro and Small Enterprises Development Agency (FMESDA), spices exporters, Ethiopian Spices Producers and Exporters' Association and different stakeholders associated with the spices businesses.

At regional and lower levels, various bureaus and offices of the SNNP and Sidama Regional Government (SRG) like Horticulture and Roots products directorates, Wondo Genet Agricultural Research Center, representatives of Halaba Producers' Cooperatives and Unions, Araka Agricultural Research Institutes, Woreda Agriculture Development & Export Promotion Offices, farmers and collectors, producers cooperatives and other stakeholders.

The KIIs and FGDs have positively and significantly reflected the importance and the huge potentials of spices sub-sector for the development of the Ethiopian economy if the sub-sector is supported with pertinent policy and strategic leadership. Most of the participants in the KIIs and FGDs have the opinions that the spice sub-sector has been hidden under the Coffee and Tea Authority with lacks proper attention for better coordination and collaboration among government authorities, development partners, and private sector leadership engagements. Thus, the information collected during the KIIs and FGDs are found to be a good basis for qualitative data analysis and recommendations/interventions. They are described here below:

1.7.1 Overall Policy Environment

The National Agriculture and Industrial policies are geared towards promoting agriculture and industry; they include Growth and Transformation Plan (GTP), Agriculture Development Led Industrialization Policy (ADLI), the Industrial Policy, Integrated Agro Industrial Parks (IAIP) Strategy, Agricultural marketing policy, the New Homegrown Economic Reform, the Ten Years Sectoral Development Plan (2021-2031) and the upcoming Spices Development Strategy which is a draft document yet. The Spices Development Strategy is highly expected by the stakeholders at all levels to give clear strategic direction for the sub-sector. As a result, the strategy envisions increasing the land allocated for spice sector development from its current level of 88.48 thousands hectare to 459.83 thousands hectare and increase total production from its current level of 632.4 thousands tone to 1.14 million tones. In addition to satisfying the domestic demand, it has planned to raise the foreign exchange earning of the country from USD 16.02 million to USSD 137.88 million.

In addition to the Coffee and Tea Authority's follow up, monitoring and evaluation activities, the other pertinent government agencies and private sector stakeholders is expected to play invaluable role for the success of the plan, according to the draft strategy. Above all, the strategy calls for spice producers, processors, traders, support and service delivery institutions to actively engaged in and support the development of the spice sector in the country and be able to achieve the goals set in the strategy.

The Government has also introduced the establishments of various Integrated Agro industrial Parks (IAIP) which are jointly run by the MoA and MoTI. The MoTI Co-Chairs the National Steering Committee led by the Prime Minister Office (PMO). It also chairs the technical Committee composed of Ethiopian Standard Agency (ESA), Agricultural Food and Pharmaceutical Agency (AFP). Although the Horticulture (fruits) subsector has becoming one of the beneficiaries of this scheme in the already established agro industries, there is no single plant focusing on spices agricultural product so far. This can also demonstrate the level of inadequate attention given to spices agro-processing industries by the government and private sector investors. Each Industrial park is equipped with laboratories in order to ensure the quality of the agricultural products for export. But these also need to include for spices agro processing.

The Key Informants interviewed are of the opinions that a little is known about the government policy and implementation strategies towards the horticulture and roots sub-sectors like Pepper, Ginger and Turmeric in particular. They are hoping and waiting for the Horticulture and Spices Development Strategy, which is now under the MoA and submission for higher-level approval. The strategy document is one of guiding tools that need to be approved as soon as possible to develop the subsector and achieve its envisaged objectives over the shorter, medium and long-term strategic periods. Some of the KII respondents mentioned "...Coffee and Tea has clear standards. When one approaches the Banks for foreign currencies and loans, the Banks can refer the standards and facilitate the requested banking services accordingly. When you come into the spices sub-sector, however, since there is no standards set by the pertinent government bodies, it is difficult to access banking services as coffee and tea does. There is no room for access to finance in the spice sub- sector compared to the others..."Spices Producer and Exporter based in Teppi-Mizan.

Other KII respondents from Ethiopian Institute of Agricultural Research (EIAR) based at Tepi Agricultural Research Centre, who is highly involved in different aspects of turmeric and other spices produced in Ethiopia, mentioned that "...the overall policy environment toward spices sub-sector and the support of policy incentives that enable producers and exporters to implement modern processing techniques

and machinery covering the whole production process-starting from pre-harvesting to post-harvest processing is very unsatisfactory. There are no developed legal enforcement frameworks that govern the production and marketing of the sub sector...”

In nutshell, although there is a broad agricultural development policy and strategy, there is no operational spices-focused policy and strategy that could give clear direction to the sub sector which resulted in lack of attention to spices sub-sector. For example, as per the overall agricultural extension policy direction, the agricultural extension workers are working with the farmers but they are not well trained with spices production etc especially in turmeric production because their trainings mostly focus on the other cash crop where the government is giving more attention like Coffee and Tea. The extension workers have real gaps in knowledge, skills, motivation, and interests as well.

The Mizan -Teppi Research Institute has been providing different supports to the spices farmers and other actors, among others, training to selected farmers, undertakes agricultural researches on better land and selected technology utilization to enhance the production and productivities of the farmers and their cooperatives; and introducing new technologies and seed varieties to the farmers in the area. According to some of the KII respondents from the Mizan -Teppi Research Institute

“... not only farmers, even researchers previously working on spices are now moving their focusing on the other agricultural products and activities like researching on animal husbandries: animal rearing and increasing animal products. The Institute was giving training and other technical supports to the major value chain actors and farmers but now days there are no such support and interactions with the key actors in the value chain...”

1.7.2 Business Development Services & Market Linkages Supports

Farmers, cooperatives, transporters and agro-processors are not well connected to do the businesses. The spices production and processing is underdeveloped stage. The spices producers and exporters usually conduct a preliminary processing of spices (which include sorting and simple cleaning of the soils from the products) and are not meeting international standards for export market in Europe. The linkages between farmers and processors are found at infant stages due to the fact that farmers are not fully supported by the concerned institutions to provide quality trainings and technical supports to enhance processing of spices and access to capital to establish agro processing industries. Therefore, the concerned authorities need to identify the missing gaps and find immediate solutions for the efficient utilization of the available resources at hand. Otherwise, we cannot reach to the height of the peak that we aim at developing the spices sub-sector to meet the international standards.

Since the spices value chain is highly dependent on small householder level growers alike other subsector (fruits), multi-faceted supports for farmers from all directions are of paramount importance to create strong market linkages. It is definitely one of the government’s priorities subsector that needs all inclusive supports in order to accelerate its development. Accordingly, the Ethiopian Spices Producers and Exporters Association (EHPEA) as a membership based private entity are also actively working to provide some BDS, market linkages and promote the subsector despite the institutional capacity constraints it has. The Consulting team found that there are only very few development partners and NGOs that support the subsector. There is a tendency to support other mainstream or conventional agricultural products’ subsectors like cereal, coffee, tea, and honey value chain than spice sub-sector. The good news is that ECX envisages to including the Ethiopian spices in its portfolio, which could facilitate the classification, and grading of selected spices to promote them for both domestic and

oversea markets. This will also help for enhancing markets linkages efforts that the business associations are undertaking.

1.7.3 Linkages between Producers, Traders and Processors

The main actors are farmers; small home based processors called “YEBALTENA SHOP”, primary cooperatives and exporter companies. The exporter companies and individual exporters are engaged not only in spices but also working in diverse agricultural products. That is, they are not specializing in spices business alone. Generally speaking, spices have a great potential for income diversification for the small holders farmers and other involved along the value chain based on the supply chain principle than real value chain approaches; reduce poverty once it gets developed for linking smallholder producers to export market. However, there is a missing links-spices processor who can make quality processing of spices passing through the three spices processing types and making domestic value addition. There are few processors who make the three types of spices processing: sorting and cleaning; sorting, cleaning and packaging; processing the spices into powder forms and export.

Overall, the linkages between producers, traders and processors are very weak because there is a big disconnect or gap between producers, traders and processors. Smallholder farmers are generally not aware of the requirements of international markets. Local collectors and traders predominantly grade products according to primary sensorial aspects (size, colour and moisture), so there is no incentive for smallholder farmers to adopt international requirements. Educational levels, information asymmetry and the significant size of domestic/regional markets also contribute to the fact that international norms remain an extremely abstract concept for smallholder farmers. Moreover, there is weak linkage among not only the main value chain actors at lower levels but also among the meso-level support institutions and macro level regulatory and enforcement institutions. With respect to the linkages between the producers, processors and exporters, generally there are weak linkages. One of the respondents in KIIs stated that “... In our areas, farmers directly supply their turmeric and other spices products to the limited middlemen (2 to 4 people) who monopolized the market. The later determines the prices and the farmers have no options than selling turmeric and other products at lower prices. ...there are no cooperatives and unions that can play a role in the spice value chain. There are long value chains with very weak linkages in spice subsector. Because of this the farmers are changing their farms from turmeric into other cash crops...”

1.7.4 Availability and Quality of Spices, Processing, Domestic & Export Markets

In the past many years, though a lot of investment activities were made in the agriculture sector, the investment were not farmers centered and as a result of this the spices sub-sector was not adequately supported and the spices were not processed to meet the international quality standards. For instance, some of the KIIs stated that most of the spices exports have been designated to the India markets. “...The Indians import the Ethiopian spices and processed it further in India and undertake quality packaging and export it all over the world...” Addis Ababa based Exporter

1.7.5 Value Addition, Packaging and Pricing

The respondents indicated that most spices processing is undertaken by HOME MADE BALTENA and there are no major developed spices agro-processing in Ethiopia which indicate a limited value addition in spice value chain. According to MoT representatives, “... the availability and quality of the agricultural products are not export-market oriented in general and the spice products are less likely being produced as per the

international market's requirements. Those who produce for the export market do not supply for agro-processing industries in some sustainable ways, which could be one of the factors for under-development of medium, and large scale spices agro- processing industries in the country. The fragmented farming system has impacted for the existing shortage and inconsistency of the supply of spices, honey and fruits sub-sectors. Generally, there is no developed value addition in spice sub-sector..."

1.7.6 Operating Capacity of Spices Processing Industries

There are no local or expatriate investors who have spice-processing plant that has reached a tertiary (3rd) level processing in Ethiopia. Although there are few local investors who has been trying to specialize in the spices production with farming of 180 hectares of land in Teppi-Mizan areas, processing and export marketing spices, they could not able to access finance from Banks. Some of the interviewed KII participants stated that "...they conducted a feasibility study focusing large scale production and processing. According to this study, the estimated investment costs for spices processing up to tertiary level will be between 100-200million birr which is difficult to get from local banks without the existence of clear grading and classification of Ethiopian spices products and land areas requirements for spices harvesting. Since spices are categorized under the bulky agricultural products, exporting bulky products will not be profitable as highly expected to the local unless it is partially or fully processed domestically... the spice development strategy should take this into account".

1.7.7 Spice Producer and Exporters

The pertinent government bodies need to make the necessary investments on enhancing production and productivity so that the newly starting agro-processing industries to become a viable investment options for both foreign and domestic investors. Until these objectives have become materialized, the future fate of the spices sub-sector will remain uncertain. On the other hand, there should be a clear cut and transparent spices development and marketing policy to materialize the objectives of the ten years development plan of the country. Since all the spices productions are small holders farmers and all traditional based farming, it has been prone to lower quality production and faced with post harvesting quality problems(for there is no post-harvest management system to ensure the quality of the required products. The current operating capacity of the agro processing industries cannot guarantee the viability of similar large scale spices industries for the subsector is driven by small holders' producers and small scale processors.

1.8 Opportunities and Challenges

The study identifies major opportunities and challenges that are believed to be important for potential investors for their engagements in the spice businesses in particular in Ginger, Peeper and Turmeric products. They are also helpful in providing valuable information for those investors who will be interested in investing in the agro-processing activities of these products. Accordingly, the major opportunities and challenges are indicated as follows.

1.8.1 Opportunities

There are many government initiatives and incentives available towards developing the spice sub-sector. They include:

- Existence of Spice sub-sector Development Strategy

- Prevalence of favorable policy environment for establishing Cooperatives
- Existence of Research centers and institutes
- Expansion of Agro-Industrial Parks in different regions.
- Favorable investment policy (tax exemption, import duty exemption)
- Availability of Africa Free Trade Agreement for Exporters
- Moreover, the specific major opportunities associated in doing businesses with these products along the value chains are the following:

A) Ginger

- Availability of varied Ginger species with organic contents, rich colors, flavors, and aromas.
- Existence of Indigenous knowledge on selection of seeds
- Revival from disease attack and new energy is galvanized
- Suitable Agro-ecologies
- High productivity on a plot of land
- Dry season production possibility through irrigation
- Existence of ample water resources from Gibe River around the Ginger Belt of Ethiopia.
- Availability of cheap daily labor
- High productivity on a plot of land
- Availability of Ginger Disease Triangle research output by AARC
- Dry season production possibility through irrigation
- Potential for sustainable supply of Ginger production
- Significant demand for processing facilities (local)
- High demand for processed Ginger products internationally
- Favorable consumption habit and attitude of Ethiopians towards Ginger
- Preference towards medicinal value of Ginger

B) Pepper

- Availability of better disease-resistant local seed such as Alaba local Pepper
- Existence of Model farmers who can supply better seed
- Availability of Indigenous knowledge on selection of seeds

- Farmers' traditional way of preventing Pepper disease(indigenous knowledge)
- Farmers extensive experiences in Pepper production
- Availability of adequate daily laborers
- Existence of suitable soil and climatic conditions
- Huge domestic demand for Pepper
- Possibility of producing high quality Pepper
- Experience of working with Cooperatives
- Existence of high demand for processing facilities
- High demand for processed products in foreign countries
- Favorable consumption habit and attitude of Ethiopians towards Pepper
- Preference towards medicinal value of Pepper

c) Turmeric

- Endemic seed variety which is suitable environment for cultivation
- Existence of specialized research centers (Tepi, Jimma, Debrezit, Kulumsa)
- Conducting research pertinent to the spices subsector
- Inherent quality of the product
- Conducive environment and huge potential for production Increasing demand from consumers
- Oleoresin Extraction Companies, Pharmaceutical Manufacturers choose to buy spices directly from Ethiopia
- Government's willingness/ readiness to promote agro-industrial projects with special attention to spices as focus area for development
- Increasing demand at local and international level
- Improved communication facilities (telephone, Face book, internet)
- Presence of many actors in the system.
- Good background and culture of Turmeric preparation and processing
- Favourable consumption habit and attitude of Ethiopian
- Preference towards medicinal value of Turmeric

1.8.2 Challenges

In the Pre and Production stage, the strategy has listed the following constraints:

- Low yield varieties in use, and lack of high yielding varieties; need for improved spice agricultural research in existing and new and locally adaptable varieties that offer opportunities for increased yield, and meet home and export market demands
- Poor quality of final output marketed;
- Weak role of private commercial investors in spices production;
- Irregular supply and variable quality of spices produced from forest and agricultural landscape;
- Lack of proper post-harvest handling practices, and problems of the marketing system in use resulting in significant post-harvest wastage/spillage and product quality deterioration
- Weak business linkage among stakeholders in the chain including farmers, traders, processors and meso level support institutions and macro level regulatory and enforcement institutions
- Lack of use of appropriate modern technologies in farm management, drying, and storage; and, lack of appropriate spices development strategic interventions.
- At the marketing stage, it has identified the following constraints:
 - Keeping spices in store for long in expectation of higher prices;
 - Adulteration of inferior varieties with better ones for marketing;
 - Poor quality of spices traded due to highly traditional pre - and post-harvest handling practices;
 - Adding water to increase weight and also color/appearance;
 - Increasing role and importance of unlicensed brokers in the trading of spices in the market;
 - Weak marketing system which is not stimulating production and marketing based on enforceable quality standards;
 - Lack of value addition in terms of major agro processing activities in spices;
 - Weak organizational capacity of cooperatives/unions;
 - Price volatility due to changes in demand and supply in local and overseas markets;
 - Lack of organized market information service to the different actors in the spices farm-to-market chain; and,
 - Weak market research and promotion in potential overseas markets for natural and processed spices products.

1.9 Conclusions and Recommendations

1.9.1 Conclusions

There are massive production and market potentials for spice products in Ethiopia due to various opportunities that are emerged within the spice sub-sector. The sub-sector has large amount of land for spice cultivation with suitable climatic and agro-ecological conditions. The spice production which is currently limited to specific areas can be expanded and scaled up in different parts of the country. This can be justified by the facts that the water resources available in different parts of the country can be used for the dry season irrigation as recommended by the agricultural research organizations particularly for Ginger. On the other hand, the availability of sufficient number of labor found in various regions for the spice production processes is another advantage for the investors. Moreover, the country has immense comparative advantages that emanates from its natural endowment of spices and as such the products do not have intrinsic problems of natural quality and almost all the spices meet the international intrinsic quality standards. However, there should be a great deal of interests and dedications shown from the private investors to make a difference in the sub-sector which will have dual benefits for both the investor and the government. Therefore, all issues raised in the value chain study are found very pertinent and valid so that the potential investors can easily be engaged in the commercial farming, agro processing and marketing of Ginger, Pepper and Turmeric products. Generally speaking, this study is a good initiative to encourage the upcoming potential investors to effectively invest in the agro-processing projects of value added spice products like Ginger, Pepper and Turmeric.

1.9.2 Product Specific Recommendations

As per the findings of the study, it is worthwhile to put forward the following recommendations in order to move ahead in the implementation of the value chain activities.

i. Pepper

Since there is no import of other high quality Pepper seeds varieties known to the farmers, use of model farmers for the supply of local Pepper varieties. METU University and other Agricultural Research Center buy good quality Pepper from ALABICHO producer farmers.

There should be attention on Integrated Pest Management system. In this connection, agricultural research institutions and centres should be supported with the required finance/budget to conduct researches in disease prevention and controls. So far there is no proper follow up from the governments even on the positive research conducted on these areas.

The government should support the farmers' cooperatives and unions in order to establish small or medium scale processing of pepper products in their localities. The regional authorities have not shown the required attention for the development of workable medium scale processing and market linkages that can incentivize the farmers and their cooperatives. That is why the production, processing and export linkages are weak at all levels.

Before establishing and launching any additional IAIP parks for agro-processing plants for both horticultural and spices agricultural products, there is a need to make broader awareness creation with the farmers and other main actors in the value chain of pepper to enhance production and productivities of the farmers on pepper.

ii. Ginger

Scaling up on Ginger in Ethiopia using irrigation at small, medium and large scale would be the way to enhance ginger productivities, which demand integrated and coordinated efforts of all actors in the value chain. This approach should be practiced all over the country to fight the Ginger disease wilt based on the existing and future AARIs study finding results. For example, using modern irrigation system, AARI produced 420 quintal of Ginger per hectare, which shows that there is big potential for ginger exports if it is supported, financed and followed with proper leadership, and management at all levels.

Since the Ginger agricultural products do not have dedicated, focused and fully mandated independent institutional arrangement, despite the existence comparative natural resources endowment and contusive large agro-ecological conditions that suitable for its farming in the country, we have not utilized the existing potentials. It is advisable for the pertinent higher government bodies to explore for the possibilities of forming an independent institution for spices sub-sector.

There should be clear government policy, strategy and marketing guidelines for the spice sub sector. Since there is no clear policy and strategy on spices products marketing, it is challenging to control and regulate the illegal business operating in the market properly. There should be standard marketing centers, which can support and facilitate the marketing system along the value chain. In addition, the government should take different measures including the disease prevention and control/protection mechanisms seriously so that it can fulfilling the international standards through adequate investing in the production and processing would help the county to get hard foreign currencies.

There should be modern technology uses like GPS system to collect data on prices from various places. ATA and other private sector actors should expand the pilot GPS system to wide areas to help primary farmers on market prices of fruits, cereals and spices markets related data. The government and private sectors actors should collaborate and give due attention to invest in infrastructure and supply chain logistics.

iii. Turmeric

The Farmers' Cooperative approach could be the viable option to add value of turmeric and prepare lager volume for exports. Currently, because of the tiresome process involved turmeric production and processing, the farmers could not able to add values in their turmeric products. Most respondent stated that "... Processing Turmeric product is highly laborious because the farmers should boil the turmeric for some times to change the color of turmeric, which requires additional labor and woods consumption for boiling fire. The farmers found it cumbersome and costly process. As a result, there should be different approaches in Turmeric production, marketing and processing for exports. That is, we need to shift from individual farmer to farmer's cooperatives approach to exploit the turmeric potential in the country. Since both domestic traders and exporters require large volumes to fulfill oversea demand, there should be a sustained support from the government and other bodies to modernize the processing of turmeric products...."

There is a need for mobilizing large number of farmers into Farmers' Cooperatives and Unions platform which requires a deliberate coordinated efforts and actions from the government and private sector leading actors;

Enhance utilization of irrigation capacity and start turmeric farming using irrigation from the month of December and January instead of farming in the month of April and May. Farming in December using irrigation makes the seeds will grow and matured well in the months of June and July where the rainy season begin. The disease will not affect the seeds afterward.

1.9.3 Term Based Recommendations

These recommendations are made in line within a given time frame so that priorities can be set accordingly for minimizing the constraints identified in the study and ultimately ensure the successful implementation of the agro processing projects.

i. Short-Term

Finalizing the approval of the Draft SPICE Strategy Documents is the first priority for the pertinent government authorities such as the Ethiopian Coffee, Tea and Spice Authority and Ministry of Agriculture. Developing a strong market linkage along value chain on spices supported by a clear government strategy and marketing system is crucial to lead the spice subsector. Institutional linkages, coordination and partnerships platform is needed. It is advisable for AACCSA also to play its own initiative to bring the relevant institutions on board periodically to address such gaps.

The ECTSA and MOA need to revisit the DRAFT Strategy Document to address spice products taking the individual spices Pepper, Ginger and Turmeric and other spices products into account. If possible the national agricultural policy and other program implantation documents and directives should clearly put spices. In most directives spices are waged in the category of “OTHERS” which affect the sub sector’s visibility

Before launching and expanding the Integrated Ago-Industrial Processing Parks in the rest of the for both horticultural and spices agricultural products, there is a need to make broader awareness creation and changes in overall attitudes and business orientation with the farmers and other actors in the value chains to enhance production, productivities, qualities and ensure availabilities for large scale processing and exports. A lot has to be done to exploit the market potentials and the benefits that it can create potentially for the farmers and for all those who can involve.

Expand the agricultural extension services and fill the missing skills and other gaps to address the production, productivity and quality challenges of spices at farm levels and create better awareness on minimizing pre-and post-harvest quality loss and making costs- and-benefits of ensuring quality and competitiveness in general;

Expanding and strengthening the new government approach on Rural Collection Centers (RCC) could help to minimize the adulteration problems that affect quality.

In order to help develop and foster businesses related agro-processing investments into tangible, presentable, and bankable business plans to attract more investments and create jobs, AACCSA and/ or other development partners should allocate adequate budget and time to conduct thorough value chain study and feasibility studies on each specific spice product separately.

ii. Medium-Term

Developing the classification and grading for spices products by the pertinent government bodies like ECX, Ethiopia Standards Agency, (E)SA, Ethiopia Conformity Agency (ECA), MOA with closer coordination and collaboration of the Private Sector key actors like Bless Agro Food Laboratory and Testing, AACCSA etc.

Establishing regional level laboratory and testing centers to ensure quality of spices

Working with ECX and Private Agri-food laboratory and testing branches offices to establish linkages with Rural Agricultural Products Collection Centers to ensure quality and competency of the spice products along the value chain up to the export markets

There is a need for mobilizing large number of farmers into farmers cooperatives and Unions platforms by the federal and regional responsible bodies like Federal Cooperatives Agency, Ministry of Agriculture) which requires a deliberate coordinated efforts and actions from the pertinent government authorities.

To incentivize the producers' cooperatives and unions, there should be a rethinking of adjusting the existing policy on cooperatives and unions to establish them along broader profit-maximization goals and objectives.

iii. Long-Term

Promotion of the Ethiopian spices and attract foreign Direct Investment (FDI) through Joint-Venture arrangement by creating access to finance and investment land for commercial farms which will give the opportunities and encourage large scale spice agro-processing in the country

Considering revision of the national land policy to allocate land for large scale commercial farm private ownership

Develop modern supply chains and logistics management system. It is the opinions of most respondents that "... Many of the spice growing areas of Ethiopia are located in interior pockets where market accessibility is very poor. There is a need to organize and develop transport and communication facilities in such remote areas..."

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Chapter Two

Value Chain Study on Avocado, Mango and Papaya



Executive Summary

This study analyzed Ethiopian potential in the production and export of fruits (mango, avocado, and papaya) given its comparative advantages in wide range of altitude, unique and diverse climate, abundant labor, vast land, and water resources. In addition, it discussed the economic importance of the fruits sector using the value chain approach using data from both primary and secondary sources. Furthermore, it analyzed patterns and trends of production and consumption in the domestic and international market, comparing Ethiopia's standing vis-a-vis African and other countries, mapping actors' linkages, problems and constraints, and finally suggested potential interventions. AACCSA conducted the study in collaboration with Kilimanjaro Consulting PLC.

The supply of fruits and processed products is not commensurate with the demand which is growing overtime with increasing population, urbanization, awareness of the health benefits and accessibility, yet, the production is lagging behind. The production of these products is constrained due to limited availability and poorly managed nurseries churning out low quality seedlings, shortage of water, limited access to improved cultivars, poor management practices contributes, erratic weather conditions, pest, and disease. In addition, services like the extension and supply of input such as pesticides, fertilizers, motor pump are inadequate, erratic and expensive thereby limiting the production growth.

The performance of the country in the export market is far below the potential. The lower quality standard of the products urged for much of the export to be directed to low income countries such as Djibouti. Only a few of the export volume was sent to regions like Europe and Middle East where both the demand and the required product quality standards are high. Apart from quality, limited volume of produce, lack of intelligence in the supply chain, under-developed packaging and cold chain, poor logistic and thus high freight cost, lack of market transparency, increasing competition, trade barriers especially in Europe market, are the constraints in the export market. Accordingly, despite the natural blessings like favorable climate and potential to raise production volume, Ethiopia remained less competitive in the export market compared to Egypt and Kenya. Improving this status and raising the earnings from export may require targeting highly demanded products (such as organic) in the developed world and overhauling the constraints in fruit production and marketing.

There is growing domestic market for processed fruits products. According to ATA and USAID, demand for processed products will increase by 33% in the next five years and much of this will be covered by import. To take advantage of the potential, the government is channeling huge amount of money to the construction of an Integrated Agro Industrial Parks (IAIP), but the benefit appears long way to accrue. The IAIP project assumed that processors will source inputs from millions of small farmers. However, the supply side has not yet been in a position to satisfy the demand from the IAIP. Efforts by SUNVADO avocado oil processor in Yirgalem to organize about 68, 000 producers in an out grower scheme to address the supply side constraint is a step in the right direction.

Actors in value chain link with one another because they purportedly obtain benefit from those linkages. Success depends on the existence of fairness, stability, predictability of agreements among actors and confidence that actor will not exploit the other's vulnerabilities. The study discovered that there are few such linkages in the sector – much of the exiting linkages across the chains are mostly informal. Although there are thousands of actors in the chain, the good chunk of the benefits often goes to the so called “shrewd” downstream actors. Information flow is highly obstructed and informal, little transparency and prevalence of opportunistic behavior made the chain unhealthy and weak operating in the conventional supply chain principles with little sense of holistic value chain tenets.

Improving the production as well as marketing of the fruit crops offers multiple benefits to the national economy including employment, foreign earnings and meeting the growing domestic demands. This requires interventions to ease barriers along the value chain. Increasing production requires delivery of quality inputs such as improved varieties, fertilizer, chemicals as well as knowledge of agronomic and disease management practices through specialized extension service that need to be made available in both space and time. Doing so requires, inter alia, strengthening the input supply system, development improved varieties and setting up certified nurseries, which meet the minimum standard, set by the Federal and Regional Bureau of Agriculture. In order to improve the export performance there is a need to strengthen the regulatory system that can ensure product quality and improve the logistic to enhance competitiveness. Moreover, correcting the irregularities in the unfair benefit distribution across the value chain actors through institutional arrangements is necessary to encourage the quantity and quality of local production.

2.1 Background

Agriculture is a key sector in Ethiopian economy and accounts for half of gross domestic product (GDP), 83.9% of exports, and 80% of total employment. The wide range of agro-ecologies in the country makes it suitable for different kinds of agricultural production system. Apart from cereals, pulses, oil crops and root crops the country has suitable agro-climatic condition for horticultural crops. Nonetheless, the country has not fully exploited the production as well as marketing potential from horticulture sub-sector.

While the share of horticulture in the agricultural GDP remains low, the official statistics show that the production of fruit crops is increasing overtime (Table 1). The lion share (90%) of the total production comes from small-scale farmers. Nearly 5 million small farmers are engaged in fruit crops cultivation on an area of about 119,909 hectares of land. Bananas contributed about 55% of the fruit area followed by avocado (17%) and mangoes (14%). More than 8,343,562 quintals of fruits was produced in the country. Bananas, Mangoes, Avocado, Papayas, and Oranges took up 60%, 16%, 10%, 7% and 5% of the fruit production, respectively (CSA, 2019).

Table 1 Trends in Production of selected fruit crops (in quintal*)

Fruit crops	Production Year					
	2014	2015	2016	2017	2018	2019
Banana	3,400,125.83	4,782,510.44	4,401,344.16	5,383,023.41	4,936,022.34	5,015,286.29
Avocado	182,063.62	536,977.64	538,245.79	649,821.04	814,317.63	847,936.48
Mangoes	721,869.77	905,613.94	1,003,514.90	1,046,461.25	1,049,807.79	1,337,049.26
Papayas	315,882.51	404,350.56	481,156.	503,961.7	543,550.24	592,051.08
Orange	311,826.52	314,276.98	412,829.84	206,559.48	305,614.80	412,499.15

*1quital=100kg

Source: CSA, various years

The fruit crops sub-sector supports millions of small farmers and creates jobs/income for million other households engaged at different stage (processing, trade) of the value chain and generates foreign exchange for the national economy. In the Agriculture’s Ten Years Perspective Plan, the production of horticultural crops is expected to increase by 42% while the export volume of fruit crops is targeted to

double until 2030. Currently, however, the fruit crop production is not only rain fed and subsistence-oriented, but also the marketing system and actors' coordination in the value chain is less organized (ACET, 2012). The downstream actors of fruit value chain, especially processors, are often constrained by volume and quality of raw material, causing price fluctuations. The poor coordination along the fruit value chain may result in unfair distribution of benefit across the actors and discourage producers who are likely to suffer most (due to perishability of the product) from the poor performance of the value chain. Accordingly, this study is designed to analyze value chain of the fruit sector by focusing on avocado, mango and papaya, thereby identify key intervention areas for enhancing the performance of the value chain.

2.2 Objectives of the Value Chain Analysis

The general objective of the study was to examine the value chain for Avocado, Mango and Papaya and identify key intervention areas required to improve the performance of the value chain.

2.2.1 The specific objectives include:

- **Characterize the value chains of Avocado, Mango and Papaya**
- **Identify the challenges, opportunities and leverage points in the value chains of Avocado, Mango and Papaya**
- **Suggest possible interventions that can improve the performance of the value chain**

2.3 Scope of the Work

The study involves reviewing and mapping the given value chain, identify weaknesses for support at the product, processing, technological, institutional (legal, regulatory and policy), market and final consumption levels. In the process, it assessed opportunities and recommend specific areas within the value chains having potential benefits for producers and actors within the chain and beyond. In particular, the study generated data and evidences on products, market potential, and Possibilities for collective marketing and chain efficiency.

2.4 Methodology

2.4.1 Essence of the value chain approach

Value chain refers to the full range of activities that are required to bring a product (or a service) from conception through the different phases of production to delivery to final consumer and disposal after use (Collins et al, 2016; Kaplinsky and Morris 2001). Further, a value chain exists when all of the actors in the chain operate in a way that maximizes the generation of value along the value chain. A value chain looks at a complex range of activities implemented by various actors (primary producers, processors, traders, service providers) to bring a raw material (production system) through a chain to the sale of the final product (DIFID, 2008; Collins et al, 2016; Herr, 2007; Trienekens, 2011). The concept of value chain, therefore, encompasses the issues of organization and coordination, the strategies and the power relationships of the different actors in the chain. There are four aspects of the value chain analysis of agriculture (Kaplinsky and Morris, 2001; Trienekens, 2011). These include:

- Systematic maps of the actors participating in the production, distribution, marketing, and sales of a particular product (or products). The mapping assesses the characteristics of actors, profits and cost structures, flow of goods through the chain, destination and volumes of sales.
- Identifying the distribution of actors' benefits in the chain through the analysis of margins and profits, which allows determination of who benefits from participation in the chain and which actors could benefit from increased support or organization.
- Examining the role of upgrading the value chain, which includes improvements in quality and product design or diversification in the product lines, served, allowing producers to gain higher value and assessing actors' profitability and information flow bottlenecks.
- Governance of the value chain plays key role in defining how upgrading occurs, structure regulation, entry barriers, trade restrictions and standards. Internally governance ensures interactions between chain participants are organized, rather than being simply random. External governance includes public sector intervention and chain specific policies and regulations relevant to value chain development.

The value added to the value chain approach comes from assessing intra- and inter-actor linkages through the lens of issues of governance, upgrading, and distributional consideration. By systematically understanding these linkages within a network, one can better prescribe policy recommendations and further understand their impact on the chain.

2.4.2 Data Collection and Analysis Framework

The study performed an environmental scanning to gather information about events and their relationships within broader macro system and an organization's internal and external environments. Accordingly, ranges of stakeholders across the value chain were interviewed. In this line, where possible, we made direct observation of primary activities at the upstream actors, collection points and processing facilities including a visit to nurseries run by both private and public entities, discussion with farmer cooperative, private investors, government officials, collectors, traders as well as those providing various services to the value chain.

2.4.3 Data Sources and Collection Methods

Both quantitative and qualitative tools were used to collect data using semi-structured questionnaire and a checklist.

Primary Data: Key Informants Interviews (KII) and focus group discussions (FGD) were made with many representatives of chain actors (producers, collectors, processors, retailers, wholesalers, and exporters), existing private and public service providers using semi-structured questionnaire. Accordingly, 2-3 FGD were conducted while observing the COVID19 protocol. The participant institutions are summarized in Table 2 (Also see Annex 3 and 4 for the detail list).

Secondary Data: data from secondary source include review of existing value chain situation of the fruits sector, consumption patterns, country specific production trends, global benchmarks. Apart from review of various studies as well as policy documents in Horticulture Sector Development, data sources such as CSA, Ethiopian Custom Authority, National Bank of Ethiopia, FAOSTAT, UNCOMTRADE, ITC (data center of WTO) were used in this study.

Table 2 Summary of Interviewees by Stakeholder Group

Stakeholder Group	Number	Type
Chain actors	16	Farmers/Producers, Collectors, Marketers, Exporters, Cooperative/Unions, Associations (ESPEA)
Chain supporters and Chain influencers	8	Government Ministries & Agencies (MOA, MOTI, FSM-MDA Agency, SNNPRS & Sidama Regional Agriculture Bureaus (RABs) and Woreda offices, IGC
Chain facilitators	6	Development Partners (DP)/NGOs: GIZ, UNIDO, FARM AFRICA, Wondogent, Araka and Teppi-Mizan Agricultural Research Institutes (AARIs)

Sample and Geographic Focus

According to CSA (2021), Sidama, South Nation and Nationalities (SNNPR), Oromia, and Amhara regional states are the major growing areas of edible fruits.

In view of time and resource limitation, representative samples were taken purposively guided by secondary sources. Accordingly, Sidama region was selected for its high avocado production which account for 36% of the national production (Mitiku, 2017). Yirgalem and Wendogent in the same region were also considered for Mango and Papaya. Representative samples were taken purposively and on convenience basis.

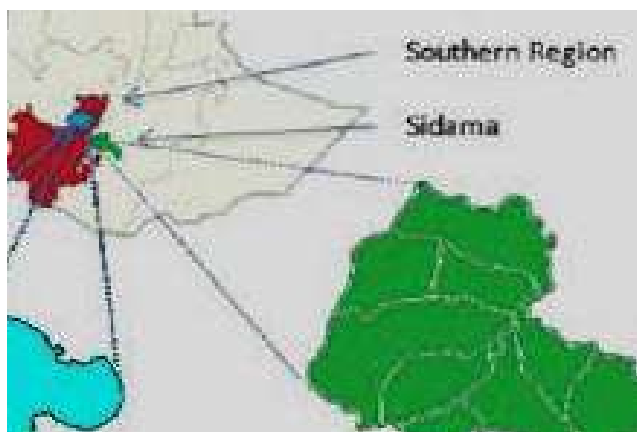


Figure 11 Map of Sidama Region Source: Accessed from internet June,2021

2.5 Findings

i. Economic Importance of the Fruits Subsector

Hosting nearly 5 million farm households in Ethiopia, the fruit sub-sector offers a range of economic benefits including employment opportunities for millions of actors operating along the value chain, health benefits to the consumer and generation of hard currency as well as tax revenue to the economy (Fanos et al, 2015; Jalata et al, 2021; Shafi et al, 2014; Wake et al, 2019; Zegeye et al, 2004). Its contribution to the foreign earnings has more than doubled (from 91 mills to 191 mills) over the last decade figure 2

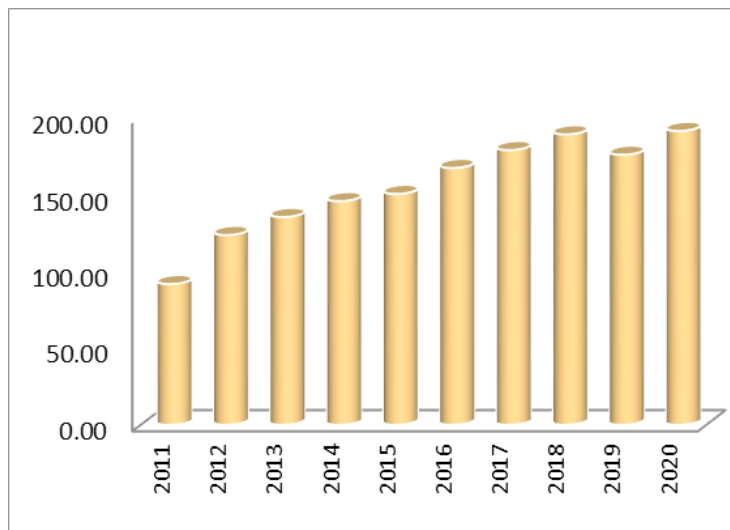


Figure 12 Annual Ethiopian Export Earnings from Fruits and Vegetables in million USD (Source: computed from NBE)

There is a growing effective demand for fruit products both locally and international, particularly for organic ones.

ii. Processing Plants and Business on Fruits

Processing plays an important role in generating rural employment, foreign exchange earnings, conservation and effective utilization of fruits and vegetables. There are only 30 large ¹ and medium-scale fruits and vegetables processing plants in the country producing limited number of products (like tomato paste, orange marmalade, vegetable soup, frozen vegetables and wine) (MoTI & MoA, 2015; Zegeye et al, 2014) and operate below capacity due to supply constraint. There are also micro and small scale processors which produce very limited products such as fruit Jams. The Government of Ethiopia embarked on massive construction of Integrated Agro Industrial Parks (IAIP), prioritizing high potential areas in four regions. ² The underpinning thought was about transforming the agricultural sector by transiting from supply driven to a demand driven system thereby ensure vast increase of profits for actors in the value chain.

iii. Demand for Processed Fruit Products

The processed fruit market in Ethiopia was equal to 80 million USD (calculated in retail prices) in 2015 and is expected to reach 593.56 million USD (in retail prices) by 2025 increasing at a compound annual growth rate (CAGR) of 18.9% per annum for the period 2020-2025 (Figure 3)- lower than 27.6% per year, registered in 2015-2019. Nevertheless, the demand is increasing over the years due to improvement in income and changing life style pushing consumers to shop readymade food such as juice. The average consumption per capita in value terms reached 0.82 USD (in retail prices) in 2015 and in the following five years, it grew at a CAGR of 24.5% per annum. In the medium term (by 2025), the indicator is

1. Examples of major processing plants includes: Awash Winery and Castel Winery, with other few growers are engaged in the production of grapevines for the production of wine, fresh table and raisin grapes. Merti Agro-processing utilizes raw materials produced by its mother company, Upper Awash Farming. It exports some of the processed food. It processes orange concentrate, marmalade squash, and guava nectar. The other is Africa Juice Tibila, Share Company produces blended concentrate from mango, passion fruit and papaya. Almost all of the juice processing plants import the puree and dilute it with water, none engaging in pulping.

2. The four regions are Amhara, Tigray, Oromiy and SNNPR.

forecasted to slow down its growth to a CAGR of 15.12% per annum. Much of these demands, however, are met through imports from Saudi Arabia, Egypt, and from countries as far as Latin America with a little local production.

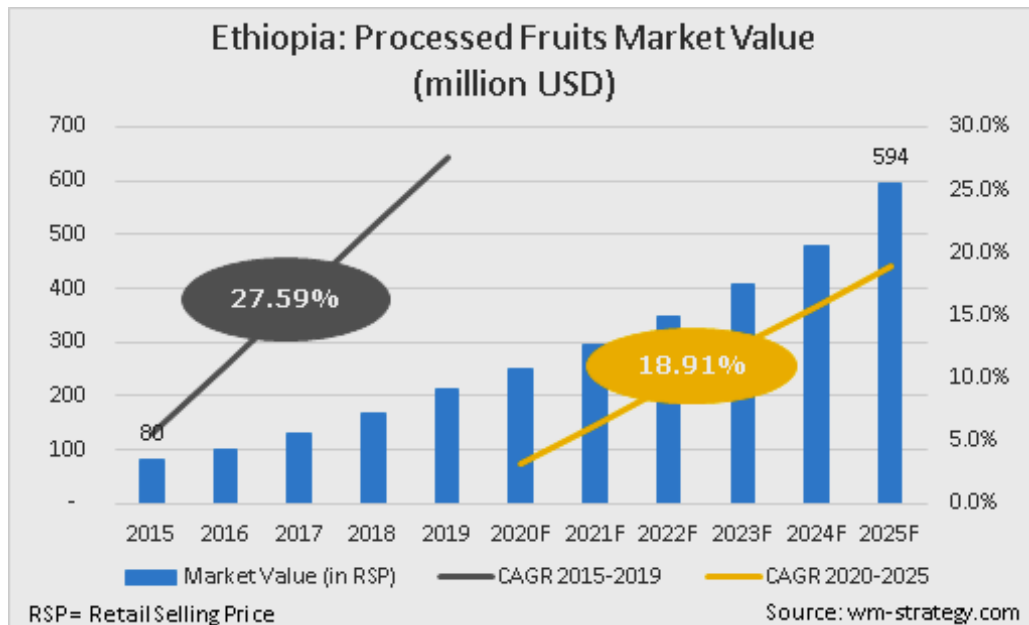


Figure 13 Trends in demand for processed fruits in Ethiopia Source: WMS, accessed in June 2021

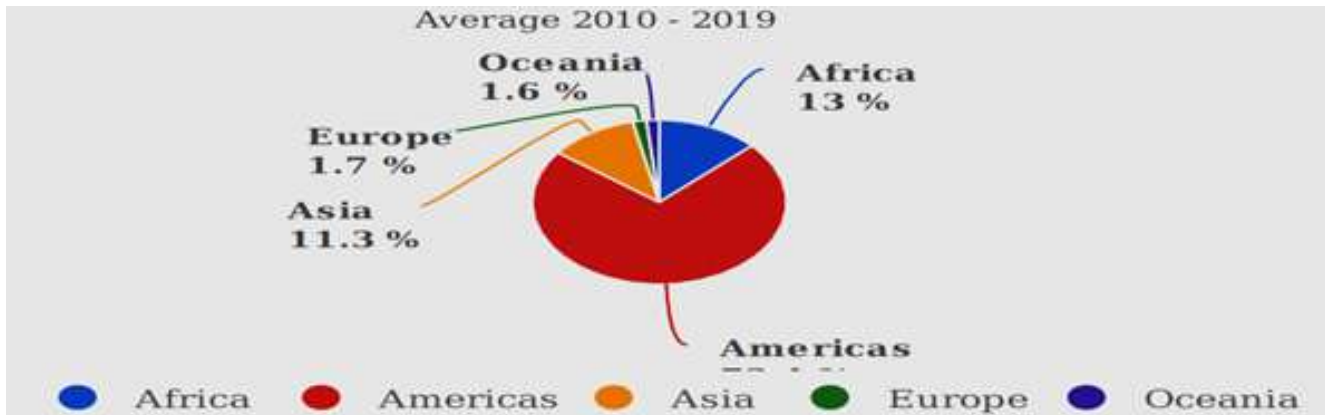
The average consumption per capita in value terms reached 0.82 USD (in retail prices) in 2015 and in the following five years, it grew at a CAGR of 24.5% per annum. In the medium term (by 2025), the indicator is forecasted to slow down its growth to a CAGR of 15.12% per annum. Much of these demands, however, are met through imports from Saudi Arabia, Egypt, and from countries as far as Latin America with a little local production.

2.6 Avocado, Mango and Papaya Value Chains

The three value chain has as many specific features as their similarities across the various functions in the fruit value chain. Accordingly, after presenting a brief context for each value chain, the findings are summarized in a way that facilitates comparison across each one of them.

The health benefit of fruit crops is becoming increasingly recognized among diet conscious communities. This has spurred the demand for fruit crops. For example, avocado, hailed for its health benefits derived from its nutrient density and high levels of unsaturated fats, avocados have now become an essential ingredient in Western diets (FAO, 2020; FAS, 2018; Jalata, 2021).

Figure 4 Production share of Avocados by region



Source: FAOSTAT accessed in June, 2021

Consumption rates of avocado fruits globally have doubled in between 2005 to 2020 reaching 5 million tons per year and is expected to double again by 2030 (Terheggen, 2019; Wale, 2019). Following the growing demand for the product, the production of avocado has increased. America contributes to more than 70% of the world production followed by Africa (13%) and Asia (11%). Europe and Oceania together contributes about three percent. (Figure -3).

Likewise, mango fruits are an important source of micronutrients, vitamins, and other phytochemicals, and provide soluble fiber, carbohydrates, proteins, phenolic compounds, and carotenoids. The antioxidants (phenolic compounds and carotenoids) as well as the soluble fibers feature protective effects against some types of cancer and cardiovascular diseases. The fiber and water contents act in the intestinal transit, preventing constipation, promoting the regularity of the digestive system as well as aiding cholesterol reduction. Mango global production has been increasing every year due to the growing demand by consumers. In 2014, it reached 42 million tons and more than \$25 billion, with approximately 3.7 million hectares of cultivated area worldwide. According to FAOSTAT, Asia dominates the global mango production accounting for 73%, distantly followed by Africa (15%). In Ethiopia, because of the diverse agricultural ecological zones, mango is almost in season throughout the year. But the two main seasons for mango are September through November which is the Ethiopian spring, and April to June.

Papaya has gained more importance owing to its high palatability, early fruiting, highest productivity per unit area, multifarious uses like food, medicine and industrial input. India is the first among the top ten papaya producers in the World producing more than 50% of the total produced by those countries combined. Other important producers include Brazil, Indonesia, Mexico and Nigeria to name a few. It has many nutritional (a high source of carbohydrates, fiber, vitamin C, magnesium, folate and vitamin A and medicinal values (by extracting the substances from different parts of papaya which have shown protective effects against many diseases such as intestinal worms' infection and different types of wounds) apart from economic ones (Etissa, 2017; Shafi et al., 2014). In Ethiopia, papaya is one of the important fruits grown in different parts of the country. It is produced in home gardens and semi-commercial levels by farmers as well as commercial level by state farms.

Although there may exist some peculiarities, these three fruits (avocado, mango and papaya) have more or less same kinds of activities and hence chain map (Figure 4). The core activities include:

Input Supply and Production – includes running nurseries, managing orchards, applying pesticide and insecticides, harvesting. Included in this are extension service for boosting productivity and finance for providing credit facilities and income generating activities.

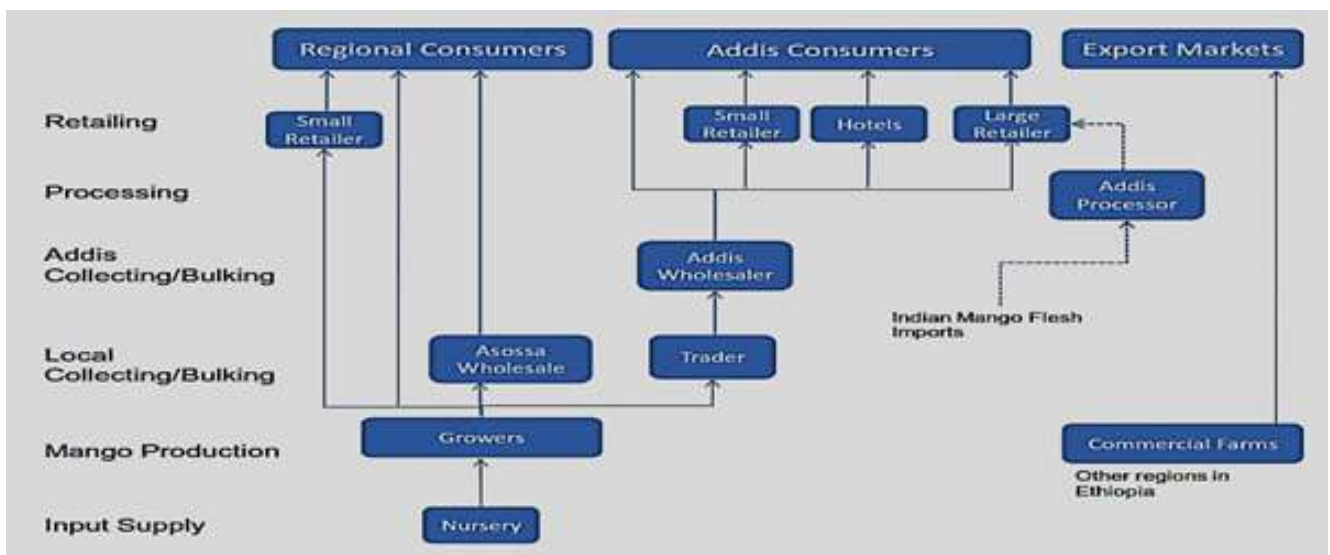
Collecting and Bulking – includes a large number of participants such as local collectors, brokers financed by bulk buyers in Addis, producers’ cooperatives, and unions.

Local wholesalers: saturated and low value, with non-existent value adding channels.

Addis wholesalers - organized under groups that have strong ethnic ties and tend to operate in ways that have been described as ‘cartels’.³ Similar to the upstream nature of the value chain, the wholesalers in Addis operate in a heavily crowded, poorly structured, and underdeveloped market infrastructure. There are few refrigerated storage facilities in the market as the cost of this investment has always been seen as too high. The main sales channels from the Addis wholesale markets are: direct to consumer, hotels, large retailers and supermarkets, and small retailers and kiosks. Knowing the share of each channel (in future studies) may help to understand if the country is moving in the direction of supermarket (most powerful buyer) or retailer dominance, as it is the case in many developed countries.⁴

Processing - given the substantial amount of fruit that is grown in the country, the fruit processing industry in Ethiopia is very weak. Among the reasons is cheap price of imported juice or other processed products creating competitive barrier for domestically processed products. Other key challenges includes: lack of technical knowledge in processing, low level of technical support for maintenance, low capital base for investment.

Figure 5: An overview of Fruits Value Chain – from Farm to Addis Ababa Market



Source: Wake et al., 2019.

3. Overtime, the wholesalers developed experience and linkages to specialize in certain fruit. For example, the major buyers of papaya or avocado or mango are not more than three or four traders. Although it has to be studied further, such trends put market power to concentrate on the hands of a few individual who set price at will colluding among them.

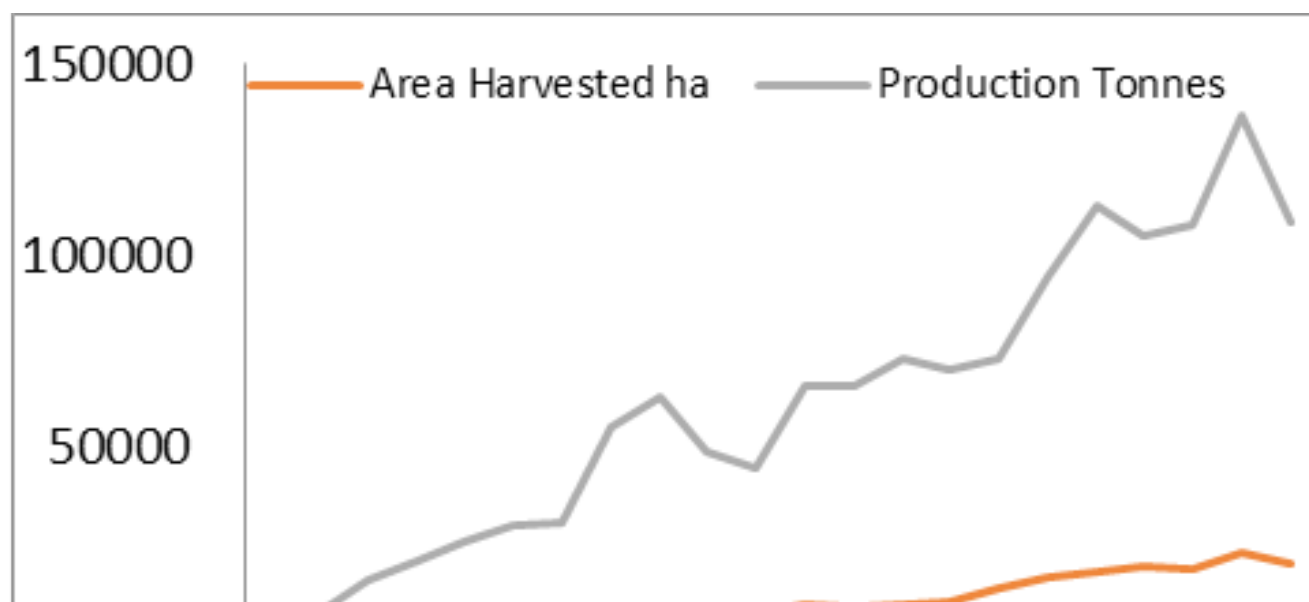
4. The supplier dominance of the past is giving way to retail control of the agri-food value-chain and a focus on consumer choice. This has driven supermarkets to move from predominantly price-based competition to emphasise innovation-based competition focused on creating value in the eyes of the consumer (Wright and Lund 2003 cited in Collins et al, 2016).

Export – Ethiopia has a comparative advantage in a number of horticultural commodities due to its favorable climate, proximity to European and Middle Eastern markets and cheap labor. This opportunity was not utilized enough due mainly to minimal production of commercial varieties, under-developed packaging and cold chain, high cost of freight, competing product from Egypt and South Africa.

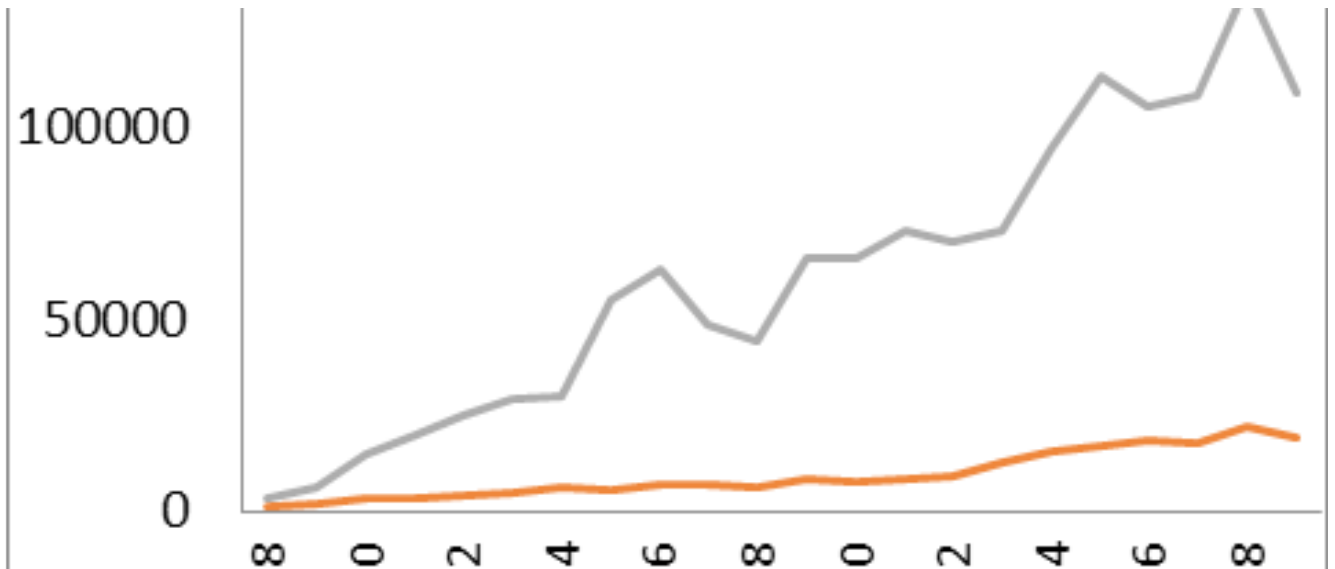
The characteristic feature of the three value chains along with their commonalities are summarized using the various functions in the value chain

Production and related services

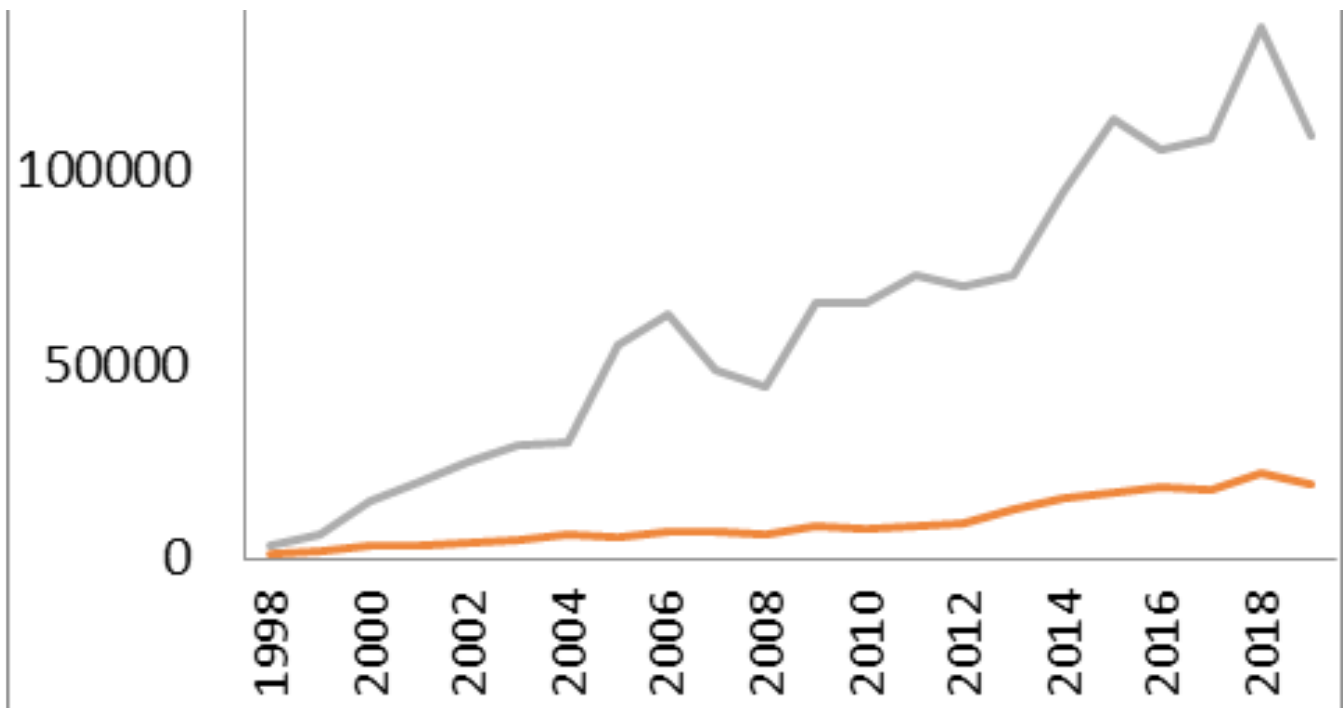
Avocado	Mango	Papaya
<p>Production status and position: In Ethiopia avocado production quadrupled between 2014 and 2019 mainly via area expansion (Figure 5i). Productivity has increased to 4.3 tons per ha. Yet, production in Ethiopia is below African and East African average and that of Kenya, a leading exporter in Africa (Figure 6i).</p> <p>Varieties cultivated: Major avocado improved varieties grown are Hass, Pinkerton, Fuerte, Bacon, Ettinger and Nabal. Hass is the most important variety for the European market.</p>	<p>Production status and position: Mango, mainly produced in the Rift Valley, eastern, western and southwestern Ethiopia, is a biennial crop that gives good yield every two years. In Ethiopia mango production grew by 45% between 2013/14 and 2017/18 (see Table 1). Ethiopia’s mango production level stood below the annual average of Africa and Kenya between 2009-2019) (Figure 6ii). The current mango production practice in Ethiopia is less competitive to markets like Europe.</p> <p>Due to disease caused by an alien pest known as white mango scale (<i>Aulacaspis tubercularis</i>), during the last two years, area and volume of production in Ethiopia declined (Figure 5ii). Huge volumes of mango was damaged in east Welega zone (Chay et al, 2019; Mogest et al, 2021; Ssemwanga, 2008; Wake et al, 2019).</p> <p>Varieties cultivated: major mango cultivars grown in Ethiopia include Kent, Keitt, Tommy Atkins, and Apple mango. Kent and Keitt (fiberless mangoes) are most demanded in Europe</p>	<p>Production status and position: Between 2014 and 2019 total production has doubled and reached to more than 59 thousand tons (Figure 5iii). Compared to Brazil, India and Nigeria, Ethiopia produces way small volume of papaya (Figure 6iii). Papaya production in Ethiopia is characterized by use of local varieties and poor management practices (Lemma et al. 2020).</p> <p>Papaya suffers a great loss due to various biotic factors, i.e., diseases such as anthracnose (<i>Colletotrichum gloeosporioides</i>), Phytophthora (<i>Phytophthora palmivora</i>), powdery mildew, black spot (<i>A. caricae</i>) and papaya ring spot virus are seriously affecting the production and productivity of papaya (Gabrekiristos et al, 2021).</p>



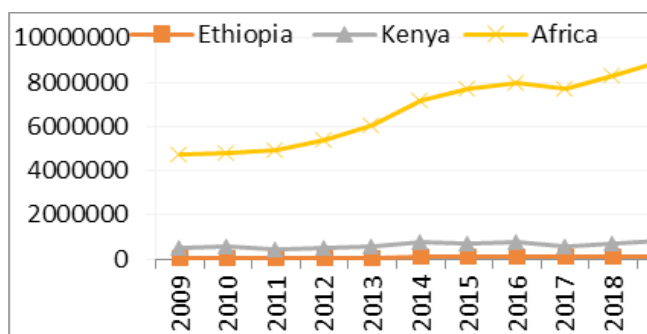
(i) Avocado, Area and Production in Ethiopia Source: FAOSTAT accessed in June, 2021



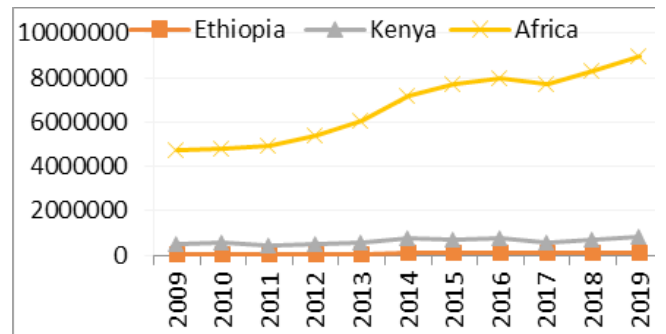
(iii) Papaya, Area and Production in Ethiopia Source: FAOSTAT accessed in June, 2021



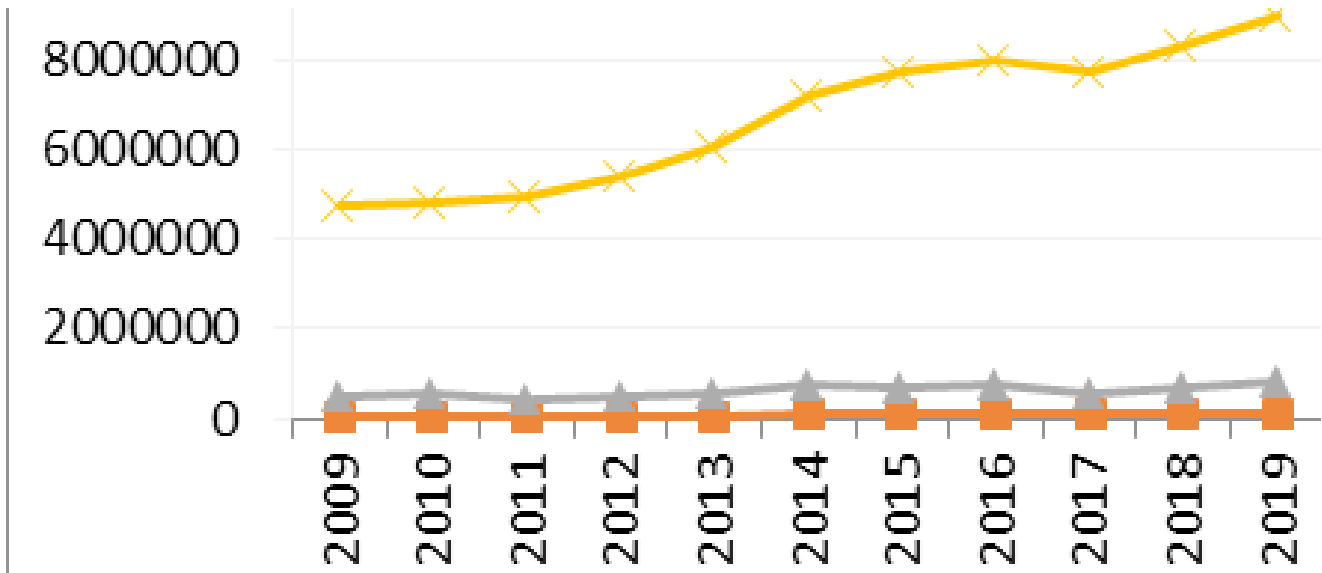
(ii) Mango, Area and Production in Ethiopia Source: FAOSTAT accessed in June, 2021



(i) Avocado production in selected African countries Source: Computed by authors from FAOSTAT data



(ii) Mango productions in selected African countries Source: FAOSTAT, accessed September, 2021



(iii) Papaya productions in selected countries Source: FAOSTAT, accessed in September, 2021

Extension service: In Ethiopia, the extension service rendered to the horticulture sector, in general, is inadequate compared other commodities. Despite emerging efforts in the area, the attention given is inadequate irrespective of the types of horticultural crops. Particularly, in the fruits subsector including avocado, mango and papaya, among others, which requires specialized services, there are no extension workers trained in production and marketing of fruit crops. Compared to other crops such as cereals, pulses and oil crops, both the area covered and the households engaged in fruit crops are quite small might not have attracted an investment towards the provision of such service. Yet, given the nature of the crop- high value, health benefit, demand in the international markets, it warrants a special attention. The dissolution of the Horticulture Agency and devolution of its role to different ministries could be a showcase of less weight attached to the subsector. In nut shell, the limited extension service in the subsector can meaningfully affect farmers’ competitiveness in any market due to the perishability of the products and the pest and disease dynamics in fruit crops. The damages caused by epidemic disease like mango white scale is a case in point.

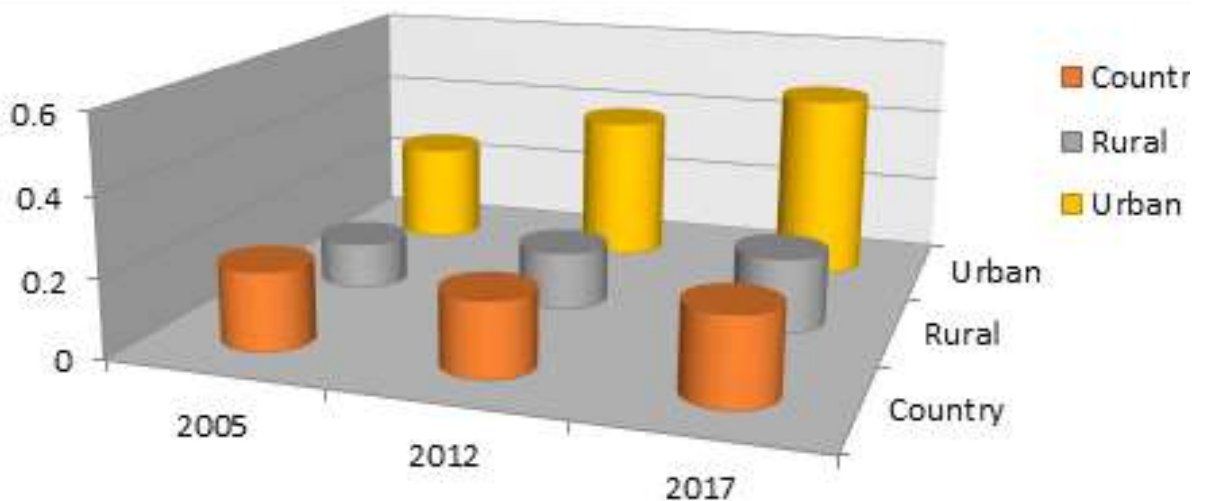
Finance: The credit facilities available to encourage investment in the fruit subsector (including avocado, mango and papaya) are either limited or doesn’t cover most of the activities along the fruit value chain. For example, small holder fruit producers and those involved in nursery management have to depend on own financial sources as the formal financial institutions hardly offer loans in this area. Partly this has to do with limited skill in preparation of fundable business plan that can attract lenders to the fruit production and marketing. As an alternative sources of finance, producers at time take advance payment from bulk buyers (on trust basis) so that they would be bound to supply their product to the same bulk buyer alone- a risk the producer takes in relation to capital constraint. Formal financial institutions such as Development Bank of Ethiopia and other support providing actors like INGOs such as GIZ, SNV, USAID mainly extend supports only for actors involved processing (such as SUNVADO), not for those involved in setting and running avocado farms as well as nursery establishment/ management. The latter have to depend on own finance

Consumption: Fruit consumption including the three value chains in Ethiopia share many features in common. Generally, fruits are consumed mainly as fresh. Widely consumed fruits are banana, avocado, mango, oranges and papaya, Domestic consumption of fresh fruits estimated at 760,000MT (CSA, 2018). Per capita fresh fruit consumption per person per year in Ethiopia is 7kg, the corresponding figure for East Africa is 55kg, in both cases, it is way below the recommended minimum level of 146kg (Michel, 2020; FAO, 2020).

Fruit consumption expenditure in Ethiopia is minimal due to poor consumption habit. For example, urban consumers on average allocated the largest proportion of their income to cereals (44.3%), followed by spices (13.3%), milk and milk products (8.4%), bread and others (8.5%), with the smallest proportions allocated to meat and other animal products (2.7%) and to fruits (1.4%) (Demissie, 2009; Fanos et al, 2015; Michel, 2020; USDA, 2018) .

Except emerging effort in processed mango products mainly packed juice, as such, there are no major value-added or processed avocado and papaya products made and consumed locally. Nonetheless, the demand for processed juice products in major cities and urban areas is growing (Figure 11). The major drivers are population growth, rise in disposable income, urbanization, awareness of health benefits and increasing number of international community in Ethiopia. In this connection, mango consumption is believed to have increased by more than doubled.

Figure 16 Trends in the growth rate of fruits consumption in Ethiopia



Source: Authors computation from CSA data

The main terminal fruit markets in Addis Ababa are located in Piazza, Mekato and Mesalemia Ihil Berenda where a variety of clients including wholesalers, retailers, and consumers converge. About 50% of the supply to these markets comes from small farmers or farmers’ cooperatives.

Value Chain Linkage: Actors in the value chain: Strong value chain linkages are critical for perishable products like fruits which if products donot reach to the consumers in specified time and quality could be spoiled and add cost to the producers and other value chain actors. The main actors in the fruit value chain include producer, local collectors, wholesalers, retailers, processors and final consumers of the product. The terminal fruit market in Addis Ababa is dominated by the wholesale market which receives products from all over the country. As the produce comes in ‘bulk’ from farms, the wholesale markets practice re-packaging and grading as the product arrives. If some of these value addition practices are carried out at farm level, it might help to improve the value chain performance.

Informal linkages: In Ethiopia, almost all linkages in the fruit value chain including avocado, mango and papaya are dominated by informal arrangement. Consequently, the chain left ample rooms for maneuvering and development of opportunistic behavior; there is little cooperation among actors and they behave in a winner-takes-it all attitude. Many studies and primary data showed that the upper

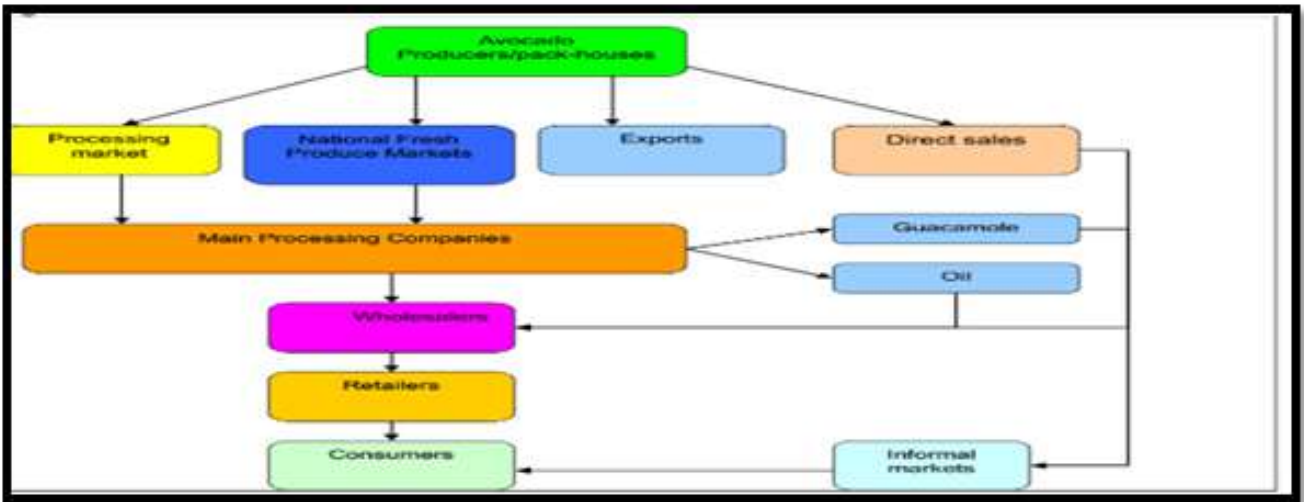
stream actors are relatively losers in such chain arrangement (Chay et al 2019; Ssemwanga et al, 2008), in the long run, however, the whole chain will be affected. For example, farmers are not well connected with the terminal market in Addis Ababa. In this study we found out that farmers have two outlet options: one, top quality fruit is collected and transported by the traders destined for Addis Ababa, and two, the remainder is sold at the local town markets, or to small retailers (who may also purchase from the town markets). The former channel fetches higher price while the latter brings lower price. Often farmers are not linked with Addis Ababa traders, so they are forced to sell the fruits through the low price outlet, otherwise suffer dumping. Processing plants which convert such fruits into products with better storage life are necessary to absorb excess supply. But such plants do not exist in many fruit producing areas. Creating a link with existing processors can address the challenge in the short run.

Dominance of a few wholesalers: The market in Addis is dominated by the wholesale markets in Mercato and the Piazza (currently moved to Lafto). The wholesalers from Addis Ababa developed experience and linkages to specialize in certain fruit. For example, the major buyers of avocado, papaya or mango are not more than three or four traders. Although it has to be study further, such trends put market power to concentrate on the hands of a few individual who set price at will colluding among them. The wholesalers in Addis Ababa are mainly groups of traders having strong ethnic ties often described as ‘cartels’. Similar to the upstream nature of the value chain, the wholesalers in Addis Ababa operate in a heavily crowded, poorly structured, and underdeveloped market infrastructure. The wholesalers, generally, hold a very high market power due to their financial power and networks- they are price setters In terms of facilities need to improve the storage life of the products, there are but few refrigerated storage facilities in the market as the cost of this investment has always been seen as too high.

Channel from wholesalers: The main sales channels from the Addis wholesale markets are direct sale to consumer, hotels, large retailers and supermarkets, and small retailers and kiosks. Knowing the share of each channel (in future studies) may help to understand if the country is moving in the direction of supermarket (most powerful buyer) or retailer dominance, as it is the case in many developed countries where the supplier dominance of the past is giving way to retail control of the agri-food value-chain and a focus on consumer choice. This has driven supermarkets to move from predominantly price-based competition to emphasize innovation-based competition focused on creating value in the eyes of the consumer (Wright and Lund 2003 cited in Collins et al, 2016).

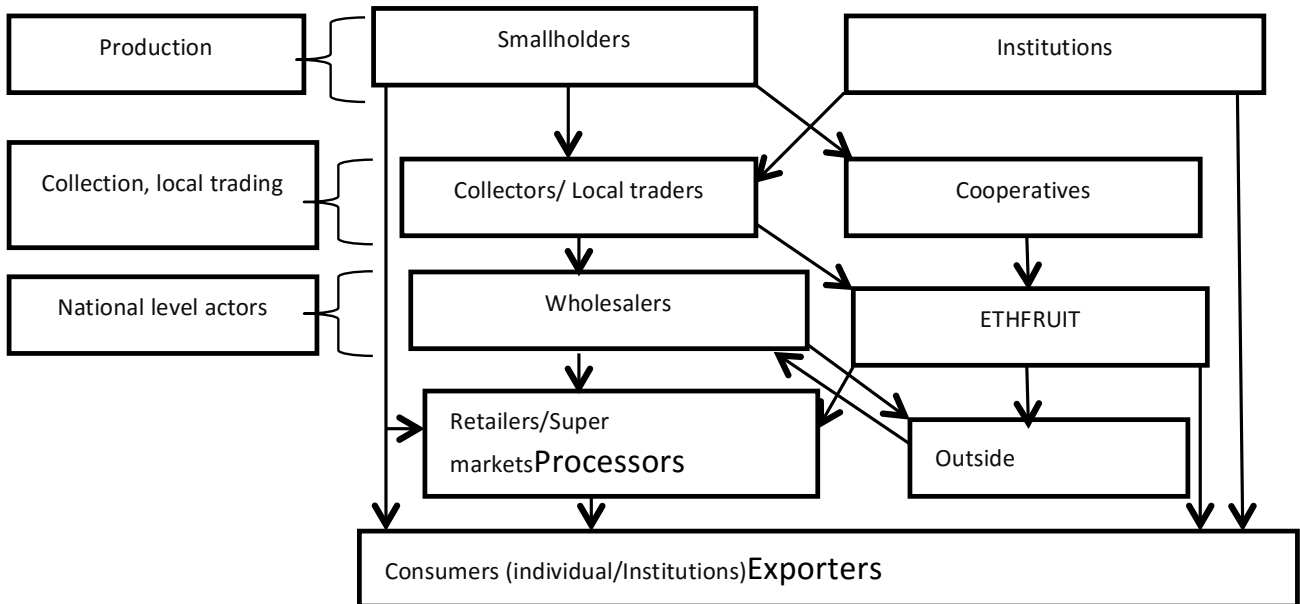
Main outlets: Principally, there are two outlet markets: the first is traders collecting top quality fruit for Addis Ababa market which offers attractive price, and second local town markets or small retailers which is often saturated, offers low price, and has no value adding channel. Most of the local collectors are farmers who use their financial resources and local knowledge to bulk for example, mango and sell to wholesalers. Farmers also directly sell to cooperatives who supply large amount of mango to regional as well as terminal markets. Retailers supply mango fruit to consumers while small scale processors like cafes, restaurants and juice houses deliver mainly juices to consumers. Figure 8, 10 and 11 demonstrates this value chain for Avocado mango and papaya.

Figure 8: Avocado Value Chain Map



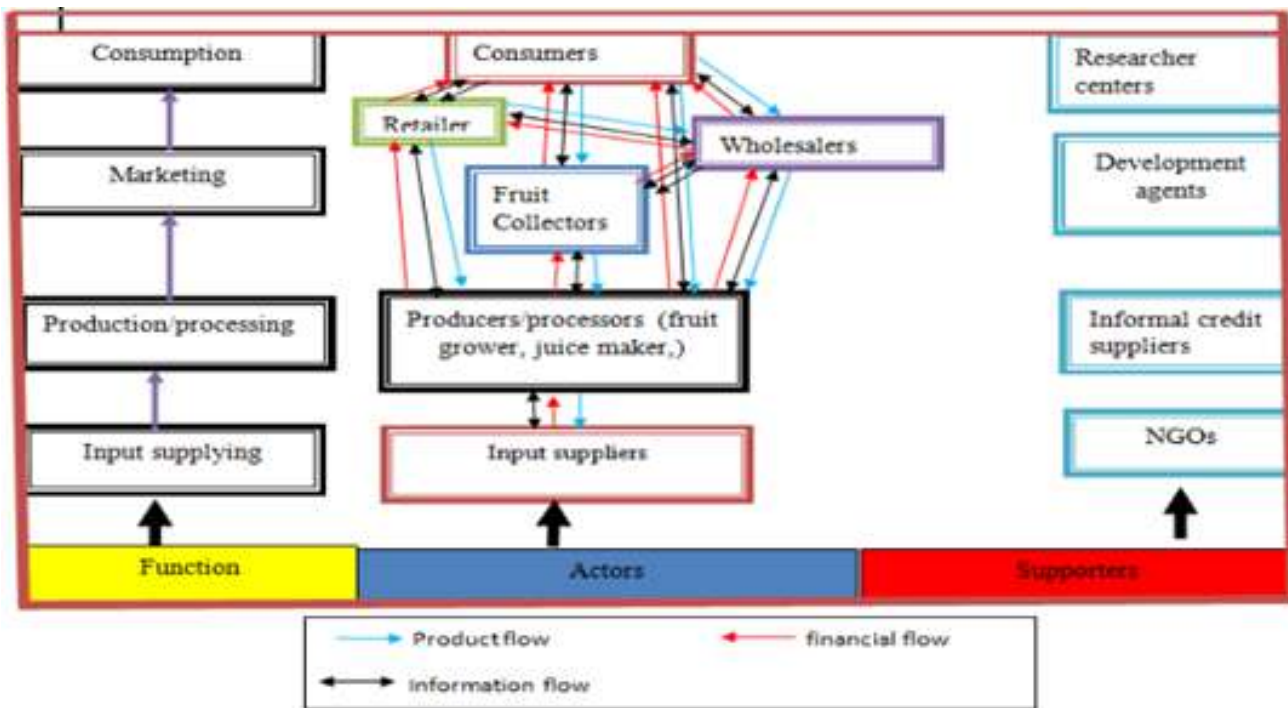
Sources: Reviews on avocado value chain in Ethiopia, 2016

Figure 9 Overview of mango value chain in Ethiopia



Source: Chay et al, 2019

Figure 10 overview of papaya value chain



Source: Shafi et al, 2014

A) Export and import

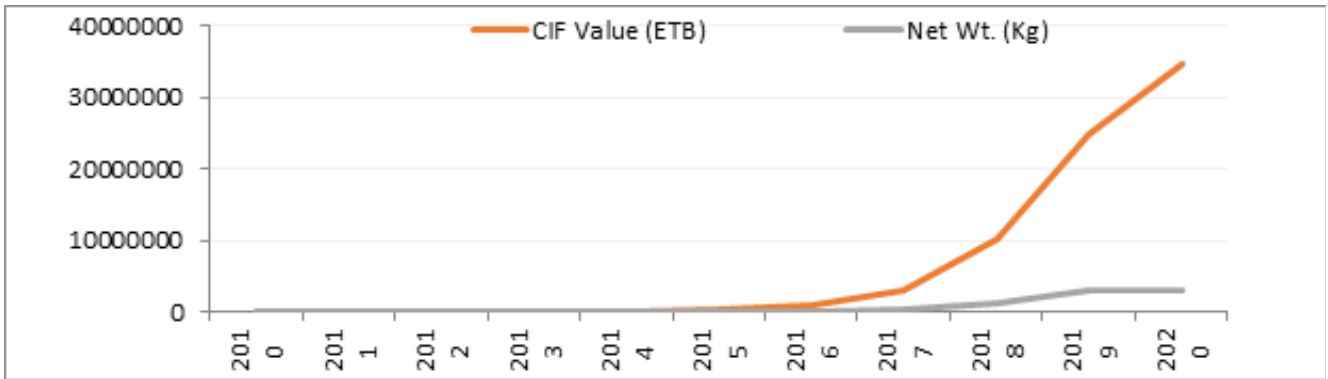
There is a growing even similar export trend for the three value chains (avocado, mango and papaya) (Figure 14, 15 and 16). However, the growth rate shows a stark difference among the three fruit crops. For example since 2015, while the export value of mango and papaya grew by three and two fold respectively, the corresponding growth for avocado showed a very sharp rise. In fact avocado had a low base but the last value still exceed that of the two fruits. But the corresponding growth in the volume of the products doesn't seem proportional. Much of the export value seems to be derived more from changes in price than major changes in volumes exported.

Moreover, the main export destinations for the three products are neighboring countries mainly Djibouti and Somalia. There are exports to the Middle East countries such as Saudi Arabia and UAE and a few European countries (mainly for avocado) but the volume of export to these destinations is quite small. This might be related to the product standard. Nonetheless, given the growing demand for fruits and the export potential, Ethiopia can take advantage of increasing the export volume considering improvements in quality (physical and consumption traits), infrastructure (cooling facility, transport cost and packaging) (Shafi et al., 2014).

Among the three value chains avocado presents a huge export potential in light of being the third horticultural crop following onion & shallots and potatoes with the highest import growth (145%) (based on the data from 2015-2019) from developing countries to European markets. The European market for avocado is still growing significantly yet the share of Ethiopia is extremely small. The main suppliers of avocado to this market are Peru, South Africa and Mexico. Colombia, Kenya and Guatemala also supply the gap left by the major suppliers. The competitors' strength however varies per country in volume, quality and variety. Ethiopia has the opportunity of an extended production season to follow up the supply from Peru and compete with countries such as Kenya (CBI, 2020).

While papaya is less demanded product in Europe and difficult both for transportation and switching from current suppliers (Brazil, Thailand and Ghana), Ethiopia has the window of opportunity to fill the mango supply gap (by timing) left by main suppliers (Peru and Brazil), and has to compete with west African country esp. Ivory Coast who has an overlapping harvest season (Ibid).

Figure 11 Volumes and Value of Avocado Export



Source: author’s computation from Customs data

Figure 12 Volumes and Value of Mango Export

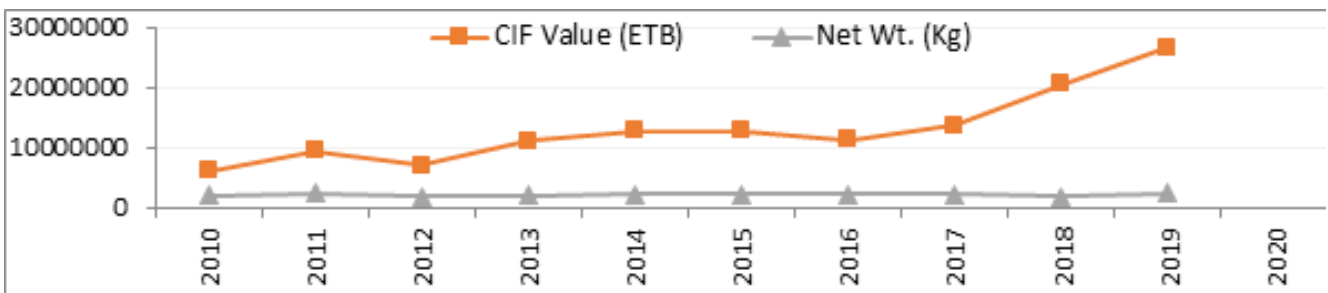
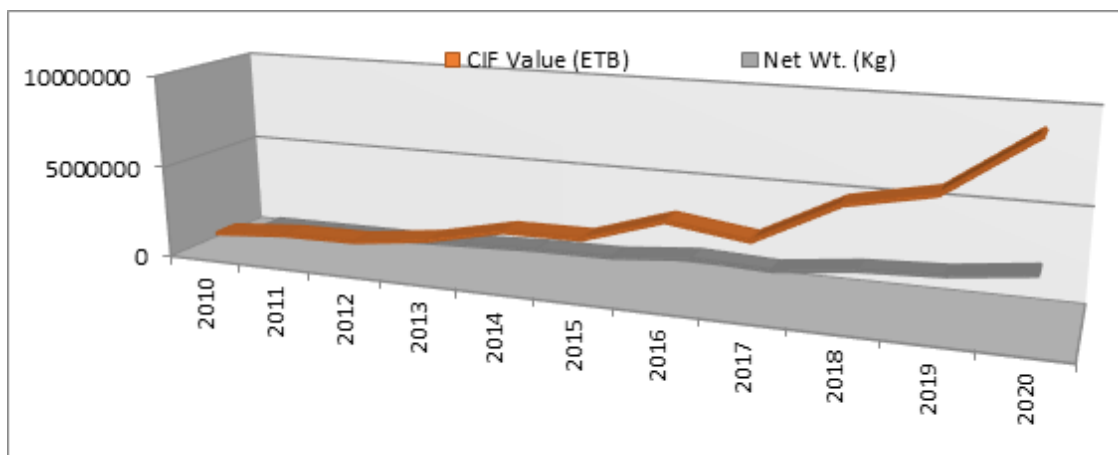


Figure 13 Volume and value of Papaya Export



Source: author’s computation from Customs data

Generally, the increasing interest in healthy, convenient and sustainable food drives the growth of several types of fruit, but at the same time, the phytosanitary and food safety requirements for many of these products are becoming stricter and Ethiopia is not yet sufficiently prepared for this. Ethiopia's unique and diverse climate offers opportunities for the export of horticultural crops and various fruits, but the country also faces many challenges in modernizing the fresh sector and improving its facilities.

In relation to imports, there are no clear and disaggregated records of import of these fruit products although the records from custom show that there are data on the import of fruit products (not specified by fruit) such as marmalades. Given low consumption habits, the local fresh fruit demands are likely to be met through local supplies.

B) Processing

In Ethiopia there are very limited efforts in terms of processing fresh fruits into various value added products. The increasing volume of production demands the emergence of processing sector which can both stabilize the market by absorbing excess produce and create employment opportunities. The processing of avocado, mango and papaya are limited to juice making at small scale businesses, cafes and restaurants. Although the figures are not clearly established most of the processed mango products are imported and more competitive than domestically prepared ones.

In fruits like avocado there are developments in the Integrated Agro-Industrial Park (IAIP) where foreign company involved in processing of avocado has started exporting its products. TRADIN Organic Company, a global front runner in organic ingredients has opened a new SUNVADO oil processing plant with a facility for premium organic avocado oil in Yirgalem IAIP in Ethiopia. SUNVADO is working with more than 30,000 smallholder farmers in a cooperative in an out grower scheme. The farmer cooperatives obtained the organic certifications early 2019; and in August 2019 the factory produced its first batches of organic avocado oil.

SUNVADO claims to have been operating below capacity (only 3 months a year, 20% of the capacity) due to inconsistent and low volume of supply. Nonetheless, there are counter claims from the cooperatives and the park administration that the company rather offers prices below the local market .⁵The irregularity between the company and producers requires institutional intervention from the government to correct the irregularities between the company and producers or it may send a wrong signal to potential entrants into the IAIP. There are initiatives from the government through the MoIT to address this challenge with the involvement of the prime minister office. The main objective is to guarantee timely supply of all required inputs to processing firms operating in IAIPs.

2.7 Opportunities and Challenges

There are a range of opportunities and challenges associated with the production, distribution and marketing of fruit crops in general, and avocado, mango and papaya in particular. Avocado, particularly, is a product who demand in the export market is growing while mango seems to have reaching its maturity level and papaya is not popular in the important markets like in Europe. However, the domestic consumption of all these fruits is on the rise. Understanding the opportunities available to

⁵ But, the regional agriculture bureau and park administrators disagree such conclusion claiming that it is not reflecting the reality. They rather claim that the company is making good profit and rumouring loss to deter new entrant to maintain monopoly power. Currently, they are working to get two more processors to start operations soon. According to the company, fair price or they call it breakeven price is 7 to 8 birr per kilo. They also claim that they should get the required volume of fruits to call such price break-even. The market for fruits is highly volatile but the minimum farm gate price won't go below six birr per kilo. At the time of interview, the farm gate price was 11 to 12 birr per kilo

take advantage of the growing demand and offering an employment benefits; and the challenges that limits the gain from the sector is necessary to make intervention in time and place as required. Most of the opportunity/challenges are common to all the three value chains and more other crops and are presented as such.

2.7.1 Opportunities

Geographic location: Ethiopia is strategically located close to most of the big world markets (Figure 17). This offers the country a competitive edge due to shorter shipping distance/time compared to competitors from South America.

Figure 14 Ethiopia’s distance to G7 and BRICS Economies



Source: extracted from UNCTAD

Production environment: the demand for fruit products (locally or in the international market including EU) is spread across the year but productions are seasonal. The climatic condition in Ethiopia allows for extended production of the fruits which fits well to fill the supply gap left by key players in the international market, particularly the EU market. For example, in Europe, avocado is considered as a winter fruit and market prices are high during the late summer and fall in relation to supply gap. The various production environments allow Ethiopia to supply avocado all year round including July to December and can target high export prices

Growing market: In light of the range of health benefits and convenience the demand for fruit products is showing an increasing trend both locally and globally. For example, avocado consumption has doubled between 2005 and 2020, reaching 5 mill tons per year and expected even to double again by 2030. The market is expected to sustainably grow in Europe, Asia and Middle East- a high potential market for Ethiopian producers.

Potential to maximize benefits from export market: there is promising fruit export markets with premium price particularly in Europe, this is very much so for avocado. Maximizing the export earnings can be increased both by increasing the quantity and quality of the produce (to take advantage of premium price) and reduction on packaging, logistics and transportation cost (refer the foot note for detail of the costs involved)⁶

Competitive in production cost: this is related to mainly for labor-intensive crops and distance of the destination market for export compared to other exporting countries located far away from important markets.

Integrated Agro-Industrial Parks (IAIP): The availability as well as the attention given to the agro-processing industries by the government offers greater opportunity for companies interested to invest in processing of fruit crops

Niche market: Ethiopia can benefit from niche export market under organic certification. Organic consumption in the EU is increasing, which Ethiopia could address through small-scale production and clean soils.

Existing knowledge base: a large chunk of small holders in different part of the country already have basic information on mango production and marketing. Hence, filling the gap in the chain will scale up the exiting knowledge base than starting new project.

2.7.2 Challenges

Limited quality and quantity of supply of planting materials: due to unavailability of registered nurseries which can supply quality planting materials in a quantity that can meet the growing demand, producers remain constrained by shortage of planting materials and limited access to improved varieties such as HASS demanded in the export market. This has also to do with the poor regulatory system which encourages supply of seedlings with low survival rate.

Disease and insect pest's prevalence: in light of susceptibility for various diseases and pests, disease and pests such as fruit fly, white mango scale, Avocado root disease present a challenge for production of marketable products. Also, plant diseases such as powdery mildew and anthracnose are among the most prevalent diseases distressing local production. This has contributed not only to the post-harvest loss but also to the challenge to meet the increasing requirements and stricter regulations for export to the European market.

Poor extension service for the horticulture sector: the extension service is not well tailored to horticulture; in general, fruit crop production in particular. There are no specialized services attached to fruits. Apart from other constraints, this has contributed for the dominance of the local varieties thus low productivity as well as quality of the product

⁶ In order to examine the profit margin in the Avocado business and export, we can base on the basic data and assumptions on the state of affairs with avocado in Ethiopia:

- Present production is 100.000 MT | Exports are 3% of total production; 95% to neighboring countries; Total exports are 3 million USD
- Local prices are around 0.15 USD/kg | Export price to neighboring countries is 0.5USD/kg
- Export price to Europe gives 2.4 USD /kg and to Arab countries/Asia 3 USD/kg

When we see the Avocado Price build-ups, the transport-flight unit cost to Europe or the Netherland seems high

- Cost of farmers: 0.10 USD/kg | Margin of farmers: 0.30 USD/kg
- Sorting/packing/cooling: 0.60 USD/kg | Transport: 1.00 USD per kg
- Overhead: 0.20 USD/kg | Total Costs: 2.00 USD/kg
- Sales price range: 2.2 – 2.4 USD /kg
- Actual profit for exporter 0.2% - 10%.

Traditional and small-scale farming: lack of knowledge and low adoption of agricultural technology (low yields and variation in quality. Moreover, small-scale producers are difficult to organize and not sufficiently reliable for retail supply contracts

Logistics and transportation: Ethiopia doesn't have direct access to the sea and lack infrastructure for sea-freight and high dependence on Djibouti. Efficient logistics are crucial for the development of fruit trade. Shortage of packaging material (carton boxes, mainly imported and thus high cost of packaging) (Sisay, 2018; Yeabsira, 2014), limited development of infrastructure (such as fresh produce facilities and cold chain) and poor transportation facility and logistic for export market affecting competitiveness of our product.

Highly competitive export market: Despite the seasonal and geographic advantage, Ethiopian fruit market faces intense competition in terms of volume as well as quality of supply from neighboring countries like Kenya.

Limited credit services: most of the actors in the value chain depend on limited own capital which constrains both on the use of modern technology and bearing the early cost of linking with various markets.

2.8 Conclusions and Recommendations

This study analyzed Ethiopian potential in the production and export of fruits (mango, avocado, and papaya) given its comparative advantages in wide range of altitude, unique and diverse climate, abundant labor, vast land, and water resources. In addition, it discussed the economic importance of the fruits sector using the value chain approach collecting data from both primary and secondary sources. Furthermore, it analyzed patterns and trends of production and consumption in the domestic and international market, comparing Ethiopia's standing vis-a-vis African and other countries, mapping actors' linkages, problems and constraints, and finally suggested potential proposal/recommendations.

Based on the brief assessment, the domestic market for both fruits and processed products is increasing overtime due to increasing population, urbanization, awareness of its health benefits, and accessibility. But, production is lagging behind due to limited availability and poorly managed nurseries churning out low quality seedlings, shortage of water, erratic weather conditions, pest, and disease. Particularly, for small farmers' access to improved cultivars is highly limited. In cases where quality seed is provided, it doesn't deliver the expected output due to traditional farm management. On the hand, the extension services deemed to mitigate these problems are limited as there are few practical horticulturalists, limited supply of pesticides, fertilizers, motor pump and its fuel. Worse still, the supply of inputs is erratic and expensive.

The problems get more complex when the country joins export due to the exacting demand of higher end consumers. Although the country is positioned in strategic location, the sector is still at its infancy. The major part of the country's export still goes to relatively lower standard requiring countries in Africa such as Djibouti with few exports Europe and Middle East .⁷ Among the major reasons are: poor quality and limited volume of produce, lack of know how in activities throughout the supply chain, under-developed packaging and cold chain, weak land and sea logistic resulted in high freight cost, lack of market transparency with buyers concentration at importer side, increasing competition, stringent trade barriers especially in Europe market. However, European buyers recognize the favorable climate

7. Export to these countries is mainly vegetables (strawberries) than fruits (FAS USDA, 2018).

in Ethiopia and its potential to produce a variety of fresh fruit. But, its competitiveness is hindered by higher prices compared to Kenya or Egypt and rendered the country to secondary or additional supplier to back up the supply from regular countries. Nevertheless, the country can still raise export earnings by selling fruits under organic certification which is at high demand in the developed world.

Although there is burgeoning market for processed fruits products, the local processing industries satisfy a very small portion. According to ATA & USAID, demand for processed products will increase by 33% in the next five year and much of this will be covered with import. To take advantage of the potential, the government is channeling huge amount of money to the construction of Integrated Agro Industrial Parks (IAIP), but the benefit appears long way to accrue. The major problem is short of raw materials and its poor quality. The IAIP project assumed that processors will source inputs from millions of small farmers. The latter, however, often fails to supply the required raw material due to low productivity resulting from lack of improved cultivar, poor farm management, limited services provision, market anomalies often disfavoring upper stream actors, vague and/or weak policy & its implementation. An attempt by SUNVADO avocado oil processor in Yirgalem is exemplary. It trained and helped certified about 68,000 thousand farmers in out-grower scheme. The unsettled matter, however, is the farm gate price of the raw avocado and requires a well-designed institutional intervention.

Trust and linkages are inextricably inevitable for the success of the value chain. Actors in value chain link with one another because they purportedly obtain benefit from those linkages. Success depends on the existence of fairness, stability, predictability of agreements among actors and confidence that actor will not exploit the other's vulnerabilities. The study discovered that there are few such linkages in the sector. Although there are thousands of actors in the chain, the good chunk of the benefits often goes to the so called "shrewd" downstream actors. Information flow is highly obstructed and informal, little transparency in operation, prevalence of opportunistic behavior (operating in the conventional supply chain principles with little sense of the tenets of holistic value chain) has made the chain unhealthy and weak.

2.8.1 Recommendations

i. Promoting Production and Marketing

In light of the findings of this study the following recommendations are drawn to promote both the production as well as marketing of the products in the three value chains. The recommendations requires improvements in the institutional arrangement, development of infrastructures, accessibility of services, availability of inputs and technologies, strengthening partnerships as well as developing the capacities of the actors involved in the value chain.

Improve regulatory system: Fruits in general are sensitive to mismanagement at early stages. Thus, it necessary to improve the operation of nurseries to churn out quality seedlings by setting standards for licensing actors who are ready to enter into the business and put in place a quality inspection modality with instruments for carrot and stick . ⁸Particularly the horticulture department (at regional/federal

⁸ Private primary nurseries visited don't manage up to the standard. Following public hype for avocado, demand for seedling has surged. The bulk purchasers included NGOs, government institution. Consequently, many entrepreneurs joined the nursery business in Sidama region. According to interviews, their success was not as satisfactory as expected. Although the nursery owners grossly complain about lack of demand, the real problem behind is the poor quality of seedling. The nursery owners are often driven by immediate cash benefit (in a year time) where they garner huge money from a small plot of land. For example, in one standard block (50m length * 1.5m width), they can produce above 5,000 seedlings. In the current average price, a block can generate 250,000.00 birr/ year (5000*50.00 birr/seedling) – an enticing return! Such hasty churning out of seedlings with no quality inspection made thousands of poor quality seedlings to get into the farmers land. The puzzle, however, is that the negative side effect won't manifest itself until the end of the third year, by then the nursery investor might have quit the business – could be classic example of principal-agent problem.

level) should develop and implement requirements for nursery business and the bureau of trade and industry should be engaged in licensing the qualified candidates.

Provide specialized extension service: Boost horticulture based extension service by availing sufficient resources including budget and qualified personnel (through tailored training) to extend advices on nursery and orchard management, disease control and marketing.

Strengthen the research and development efforts: As a perishable product which requires innovation to ensure ability to control disease and pests thereby enhance productivity and competitiveness, the R&D need to be strengthened. Better varieties and management practices that can respond to the pest and disease dynamics and the traits demanded in the market need to be developed. Thus the development and promotion of improved varieties with the required traits as well as agronomic and disease & pest management practices would remain crucial.

Provide necessary support to promote and increase the share and competitiveness in the export market: the government needs to provide incentive by modernizing the logistic, transport service, improving the availability of packaging materials (for example encourages local production of packaging), and providing targeted financial scheme for actors interested to invest in the sector. Moreover, equipment need for nursery management such as grafting knives scissors and plastic crates should be available both in quality, quantity and affordable price.

Contract enforcement: Create strong institutional arrangements that can formalize contracts/interactions between agents involved in marketing and production side and ensure law/contract enforcement thereby promote linkage, sense of interdependence, accountability and trust between value chain actors

Certification: Buyers requires certificate to assure quality through traceability and labeling. Responsible government bodies should work to assist exporters to acquire certificates of Global Gap, BRC (British Retail Consortium), IFS (International Fire Consultants), FSSC2200 (Food Safety System Certification) and SQF (Safe Quality Foods). For the niche markets, organic certification and Fair Trade may be required. Ethiopian producers have the potential to produce organic fresh products. Farmers will need help in assessing the possibility, costs and return on investment of certifying their crop. It is important to do this in cooperation with specialized organic buyers in Europe. Differentiate between suppliers: For smallholders, focus on organic products, fair trade and wholesale channels, and larger growers should be prepared for supply contracts, retail requirements and the organization of efficient sea freight logistics.

Improve logistics: Efficient, lower cost and sustainable logistics are key in Ethiopia's future in fresh products. It will make products more acceptable and open up many more opportunities. It requires finding stakeholders and facilitators to improve road and sea logistics.

Improve productivity and organization of small farmers: Small farmers and exporters are vulnerable to disasters such as drought. By improving their productivity through agricultural knowledge on new technologies and access to irrigation facilities, farmers become more resilient during natural disasters and improve their competitiveness, thus becoming more attractive for international buyers. Helping them into an organized cooperative structure will increase their bargaining power (and income) and their access to foreign markets.

Promote partnership with foreign partners: The involvement of foreign companies will stimulate knowledge transfer and guarantee a more structural supply, as well as further integrate measures for social and environmental compliance. Look for foreign investing partners and dedicated sourcing companies that are willing to help set up a long-term relationship in the fresh fruit market. At the same time, it will be important to measure the impact on local entrepreneurship and socio-economic improvements. Long-term successes entirely depend on a reliable partnership. It is not surprising that much of the supply from Ethiopia is organized by foreign entrepreneurs, which understand the high European standards in agricultural production, food safety and quality and to which EU buyers can better relate. Ensuring that local exporters are on par with foreign producers in Ethiopia often involves a steep learning curve in mentality and market understanding. Training is evidently a major focus point, but even more important will be an assessment of the true potential and motivation of the exporter.

Focus on regions with comparative advantage: Ethiopia has different microclimates, which means it can target different supply seasons. For export projects, the focus regions and their seasonality should be analyzed to see if there is an interesting window for the European market.

ii. Upgrading strategies

Government and stakeholders should work to upgrading the following.

Process upgrading: help farmers to produce the same product more efficiently – by using new technologies or management methods. For example, farmers may grow more by switching varieties or applying fertilizer; or they may reduce pest attacks and save costs through integrated pest management rather than spraying. Assist farmers to improve their links with other actors in the chain by formalizing contracts.

Product upgrading: assist farmers to get certified seedlings, planting, orchard management. This should be carried out by MoA both at federal and regional level, extension service.

Functional or intra-chain upgrading: assist farmers to take on new activities in the chain, either upstream or downstream, or change the mix of activities they undertake. For example, they may start grading and sorting their produce; they may bulk it to make pick-up more convenient for buyers; or they may process it to improve its value or increase its storage life.

Chain or inter-chain upgrading: farmers can also set out on a new value chain; they can start growing a new crop such as Hass for Avocado, Apple or Kent for mango by transferring their skills and experience from their existing enterprises.

iii. Business Environment and Policy Assistance

Governments and all stakeholders may support value chain upgrading through legislation, regulations and policies that relax value chain constraints. These can be thought through:

- Providing market access by negotiating to lower barriers for (international) trade;
- Supporting physical infrastructure development to achieve a smoother flow of products through the value chain (better roads and distribution facilities such as storage of products and better communication infrastructures);

- Giving access for value chain actors to production technology and other resources through for example import subsidies, and provide access to credits;
- Supporting through knowledge infrastructure development by setting up well functioning education systems and providing training facilities; and
- Providing a stable economic, political and legal climate.

iv. Improved Access to Business Development Services (BDS)

Potential BDS required	Potential BDS providers
Value Chain Development (VCD) facilitation including intervention strategy development, linking operators, networking service provision, etc.	Consultants, business associations, large companies (chain leaders)
Advisory services (production, processing & handling practices, management, marketing etc.)	Consultants, business associations, other BDS, large companies, govt. extension.
Extension and training services.	Public/ private specialized institutions, business associations, other BDS.
Organizational development of farmer organizations & MSE associations.	Consultants, NGOs, public organizations.
Research & development, technology transfer, product development.	Public/ private research institutes, consultants, business associations.
Certification and laboratory control services.	Accredited public/ private laboratories/ certification bodies.
Input supplies including information on appropriate use.	Input suppliers: cooperatives, Agro-dealers, NGOs.
Transport and logistics services.	Middlemen, Transporters
Market information, market linkages, export promotions	Business associations, public/ private BDS, Chamber of Commerce, Consultants, NGOs
Exchange of experiences, joint learning, joint marketing.	Producer organizations (farmer groups, cooperatives), government, NGOs.
Consumer awareness campaigning.	Public health services, consumers' associations, consultants, NGOs.
Lobbying and advocacy.	Business associations, AACCSA, NGOs & DPs

v. Chain Governance

Value chain governance describes which actors within a value chain set and enforce the parameters under which others in the chain operate. Much of the focus is on the power of actors at different nodes of the value chain to control or govern upgrading activities, and the terms on which different firms participate within the chain. Embedded in governance are inter-actor relationships, power dynamics – both symmetrical and asymmetrical – and the distribution of benefits. This is critical in the sense that chain governance facilitates or hinders upgrading and the ability to respond to market changes, especially in global markets. In short, chain governance is particularly important for the generation, transfer and diffusion of knowledge leading to innovation, which enables actors to improve their performance and sustain competitive advantage, etc.

In the study, we found that wholesalers' in Addis market wield relatively more power. But, given time and resource limitation, we skimmed information mainly from secondary sources and limited observation. Hence, we recommend further analyzing of chain governance in the spirit of whole-chain perspective to determine leverage points: where, how and when can practitioners intervene to effect systemic change and influence industry behavior. Analysis should seek to understand:

Economic interests: Assess interests and incentives at aggregation points and determine how changes in the system will impact the benefits, profits, and power that are likely to accrue to lead firms versus suppliers.

Social structure: Work with respected social figures, such as key farmers, chiefs and elders who can influence others to adopt or purchase new techniques, technologies, services or inputs.

Competition and strategy: Changes in the level of competition or in lead firm strategies can pressure buyers, traders and others to change predatory or abusive behavior.

vi. Quality Assurance and Safety

In the value chain, several factors compromise the quality of food because of the long route fruits traverse in the chain – from production and usage. In addition, many people are involved with the handling such as farmers, transporters, warehouse employee, factory worker, internal storage, logistics operator making chance for mistakes higher. Hence, there is a need to strengthen the implementation of GAP through empowering regional food quality certifying agencies and through continuous training of the chain actors.

2.8.2 Proposed Intervention Areas

A) Strengthening business linkages among the value chain actors

Effectiveness of value chain in ensuring value for money, minimizing operational cost and ultimately enhancing competitiveness, depends to a large extent on the elimination/overcoming of constraints and seizing opportunities through collaborative value-chain. The proposed interventions are underpinned by the concept of whole value chain approach where both horizontal and vertical linkages need to be strengthened for a collective performance.

The Ministry of Trade and Industry (MoTI) together with the Ministry of Agriculture (MoA) need to facilitate and spearhead the initiation of stakeholder co-ordination platform targeting each crop on the major/potential growing areas. The platform can embrace actors involved both in the production, processing and marketing of the three value chains. This is important in building trust among actors, aligning skills; resources and information thereby promote collective action to maximize the individual actors' gain and ultimately competitiveness of the product in the export market. Vertical linkages such as the SUNVADO-avocado producers out growers' (contract farming) scheme can be adopted (based on context) to resolve issues associated with low volume of supply (which forces processors to run below capacity) and market assurance (an incentive for producers).

Furthermore, horizontal linkage can also be promoted across producers (farmers or cooperatives) to enhance their forward linkage with processors, collectors, wholesalers, retailers and/or consumers as appropriate. Moreover, it is wise to scan the value chain on regular basis to identify irregularities to safeguard or enhance the collective performance of the value chain.

B) Strengthening horizontal linkage with logistics & others services providers

Trust and linkages are inextricably intertwined within a value chain. Organizations without linkages have little reason to trust each other. Trust is built on fairness, stability, predictability of agreements among strategic partners and confidence that partners will not exploit the other's vulnerabilities. To build such system, the major responsibility falls in the shoulder of the government in support of NGO & other actors. As indicated earlier, comprehensive assessment of previous experience should be conducted to assess experiences in light of value chain perspective in participatory way. After validation of findings with stakeholders, develop an effective enforcement mechanism (rules, regulation... in place to enforce the rules and regulations.

Services, on the other hand, can be provided as general (such as posting price and other important information in public places) and/or sector- or product-specific services. It can be provided by public sector agencies, nonprofit organization, private companies, formal financial institutions, local and informal service providers, etc. Options include: a) free public service financed by government and/or NGOs, b) specialized fee based service by private companies, c) embedded services where the beneficiaries do not pay direct fees for the embedded services, but the cost of providing the services is included in the price paid for a particular product. The conundrum, however, is deciding which ways to follow in filling service gaps or improving the existing services.

In Ethiopia, essential services are in many cases still provided publicly through a combination of donor, government and NGO financing mechanisms. That is, the services are either provided freely or heavily subsidized. For example, in our field visit, we observed that government research center is distributing avocado seedlings free of charge to farmers regardless of their economic status. Fee based services are very limited. Recently, however, the better off farmers are buying inputs especially avocado seedlings private nurseries motivated by its potential current and future demand. But, many rural communities still have few opportunities to access private services and millions of farmers have insufficient incomes to pay for them.

Recommending a certain pathway is tricky. But, whichever channels followed, the underlying principle should be demand-driven service provision (market oriented) – movement away from supply-led provision. Subsidy should be given but not indefinitely. It can be designed in such a way that they should gradually dry out by gauging against performance. This market orientation means that projects should be designed in such a way to develop business skills alongside the core chain actors and, at the same time, to identify, foster and strengthen business skills of those that provide support services.

C) Certification of ISO and other quality & standards to enter developed and emerging Markets

High quality standards and protocols have pushed many exporters from the developing world like Ethiopia to keep their products for local consumption only. The ISO entails country to implement good agricultural practice (GAP). Used in numerous contexts, the term "GAP" has different meanings for different stakeholders. Summary of the major tenets of GAP that the country has to fulfill to obtain ISO certifications includes (Gashawbeza, 2014; FAO, 2016):

- Structure – a country starts with the identification of a Scheme Owner⁹ who is responsible for designing and implementing the Scheme.
- Option for implementation – the structure could be established either through a voluntary or regulatory route.
- Required policy decision to implement GAP in the country includes:
 - Whether the GAP scheme will be implemented on a voluntary or mandatory basis;
 - Structure to be established for implementing GAP;
 - Who is to be the Scheme Owner and which department is to be responsible and act as the Secretariat?
 - Whether the certification body is to be governmental or private, whether there is to be a single certification body (CB) to be accredited or multiple CBs;
 - The mechanism for approval of the CB – whether the CB is to be accredited or is it to be simply approved by the Scheme Owner based on the requirements of ISO 17065;
 - Constitution of the multi-stakeholder committees which will develop and oversee the operation of the Scheme – Steering Committee, Technical Committee and Certification Committee or other;
 - Finalizing the standards and Scheme documents on GAP – the 4 modules – whether a single module will be implemented or the whole set, and whether implementation will be gradual and progressive – all these will depend on the country/ producer priorities; and
 - Developing a certification mark or logo.
- Fulfilling the GAP requirement remains to be challenges in the foreseeable future. But, they started efforts should be scale up for the country to increase export earnings.

D) Develop export products and skilled human resources

Export market is highly competitive landscape filled with different kinds of requirements such as: quality, quantity, on-time delivery, consistency, organic production or stricter on MRL's (Maximum Residue Levels of pesticide residues). The requirements are getting more and more exacting with little sign of abetting and meeting those requirements may need the following actions:

Elevating high technical and organizational skills with short term and long term strategies. In the former, sourcing the lacking critical expertise such farm managers from abroad. In the later, design a strategy whereby expats are gradually replaced by locals through on-the-job training (which is actual happening in flower farms). Besides, engage different university to provide practical lesson on horticulture linking with farms, Jimma University¹⁰ is a case in point and other can learn from it.

9. A Scheme Owner is an organization or a body, governmental or private or non-governmental organization that can be nominated by the government of the country or can be selected by an industry body. Where the government or a regulatory body is the Scheme Owner, it is also known as the competent authority for the purpose. The Scheme Owner may rely on an accreditation body for approving a certification body. An accreditation body is an independent body to testify the competence of conformity assessment bodies used in the Scheme. The accreditation body needs to comply with ISO 17011. It will function as part of an international system under the aegis of the International Accreditation Forum (IAF).

10. A major effort is being undertaken to improve the knowledge and skills in the coming years. Jimma University, jointly with Practical Training Centre (PTC) and Wageningen University and Research Centre in The Netherlands is bringing the Horticulture Education in line with the requirements of a competitive export sector. Furthermore, the EHPEA has started with practical training courses for existing farm staff and has plans to start with a Horticulture Practical Training Centre.

The government should support local investors in a well schedule subsidy scheme until they compete with foreigners or at least as the neighboring countries such as Kenya.

Logistic – accelerate the construction of cold-room fitted aggregation points at Mojo dry port with the assistance of partners such as The Netherlands Embassy to other potential producing areas. In addition, mechanism should develop to get more refrigerated containers to hinterland with relatively cheaper price.

Strengthen agro-dealers to supply standard inputs such as seedling, fertilizers chemicals.

Start by entering the niche market in higher end consumers. For example, Ethiopia is able to supply high quality avocado fruits on the counter season to European market. That is, its climate allows manipulation of the production of avocado for all year round, and therefore allows planning ripening for July – December targeting higher export prices.

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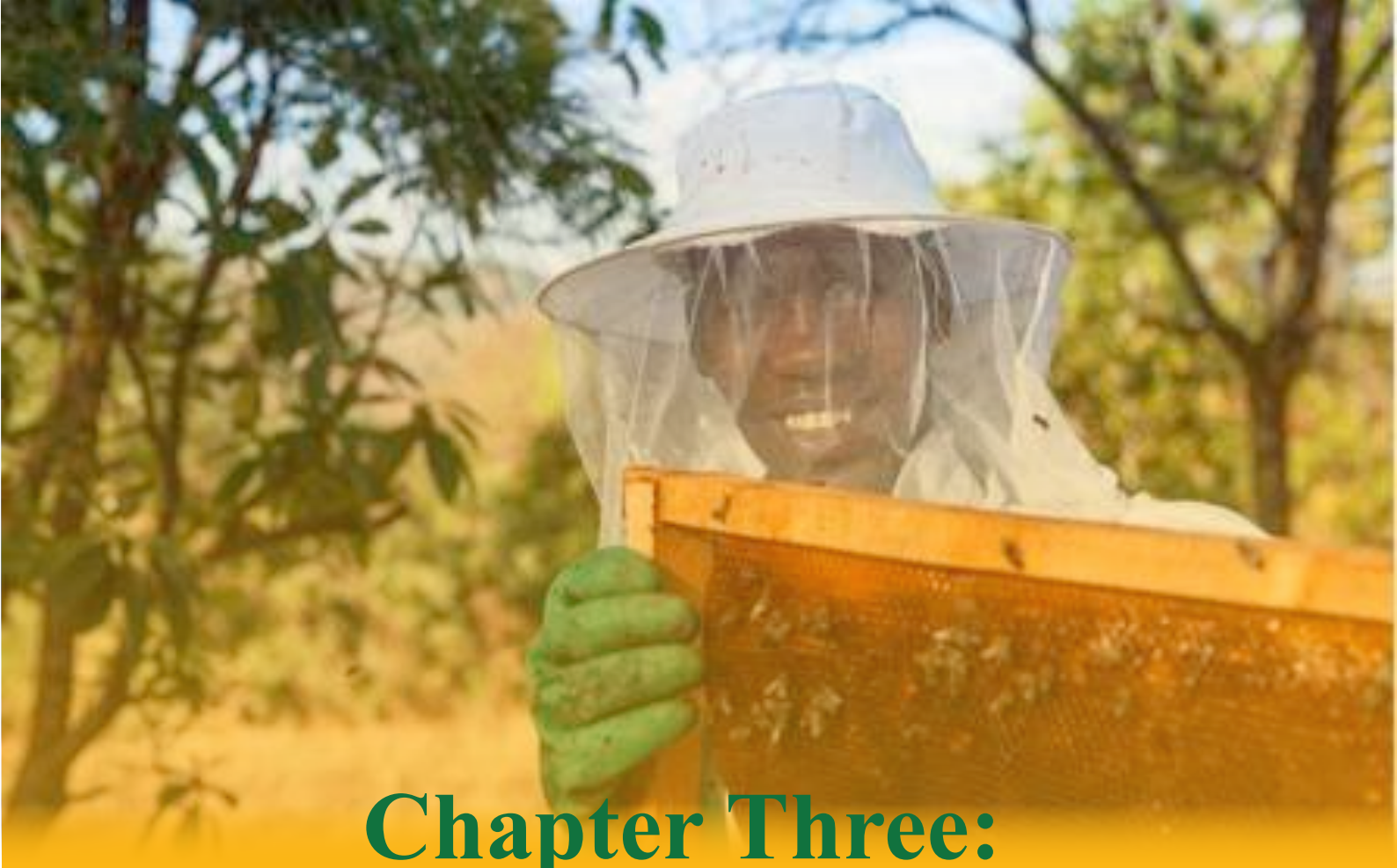
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Chapter Three:

Apiculture and Honey Value Chain



Executive Summary

In Ethiopia, beekeeping has been practiced for centuries. Of countries across the globe, no country has had such a long tradition of beekeeping than Ethiopia. Despite its long history, however, beekeeping has been managed in a very traditional and low productivity manner. According to evidences, the production, processing and exporting potential of honey and related products is huge but realized only insignificant share of its potential.

According to reviews and consultations made, there is no apiculture sector development policy in place (it is in draft yet) which provides guidance to the development of the sector. According to interview with the ministry of agriculture, apiculture sector policy is in draft form currently. But there are apiculture sector development strategies and programs and plans. In order to encourage beekeeping and business, the Government of Ethiopia established a conducive policy environment for the apiculture sector under the agriculture Growth and Transformation Plan (GTP) (MoFED 2010), among which Apiculture Resources Development and Protection proclamation 660/2009, which provides the conservation of the biodiversity of honey bee races and honey source plants and the development of the apiculture and the production of honey products.

The building of Ethiopia's competitive advantage in honey and beeswax production to develop a substantial export trade is an important goal of the Growth and Transformation Plan (MoFED 2010). Having seen its potential, the ten-year perspective plan has also given some attention towards the development of apiculture sub-sector. By 2025, the current estimated 1.4 million smallholder beekeepers will be doubled, while average production per hive will increase from the existing 10 kg/hive to 40 kg/hive. Average net income from the total traditional, transitional and frame hives will rise from about ETB 1350/hive currently to ETB 5400/hive.

The global honey market offers huge opportunities for Ethiopia. The EU market's 40% was imported from abroad. The sector has honey production, processing and exporting opportunities. Ethiopia has got market access opportunities in EU market through Everything But Arms (EBA) initiative, US through Africa Growth Opportunity Act (AGOA), other advanced and emerging economies. As a member of AfCFTA (African Continental Free Trade Area), Ethiopia has market access opportunities in African market, which is a net importer of natural honey.

Ethiopia has been promoting export sector through periodic revision of its investment code, improving incentives scheme, improving business climate and expanding the required trade infrastructure. As the result, exporting firms have been enjoying more privilege than non-exporting ones. In addition to honey and bee wax, there are opportunities to diversification into a number of other bee products such as propolis, royal jelly, pollen and bees' venom, which have a very huge demand for their health and nutritional benefits have the lucrative international market.

Moreover, given its organic and nature and environmentally friendly system of production, Ethiopia can expand its market into organic and Fair-trade honey market which fetches premium price for the country and beekeepers.

In the honey market system, products follow two main channels: The first channel/ conventional way go from producers to local aggregators, wholesalers/processors and retailers and then consumers. The other (contemporary) way is the flow of products from primary producers to final consumers through farmers' cooperatives and unions. Sometimes, there is no strict division of functions among

different value chain actors. Generally, the main actors in the honey value chain include input suppliers, beekeepers, cooperatives, unions, processors, local aggregators (middlemen), retailers, consumers (domestic and foreign) and tej houses (locally brewed honey wine).

The finding shows the existence of huge price variations between primary producers and retailers' prices in the local markets. Smallholder farmers supply their products are fragmented and unstructured and entailed significant transaction cost (like transportation cost) making the value received by farmers very low.

The overall trend in fresh honey production remained more or less the same for longer period of time, partly because honey production is an off-farm activity meant to generate additional income for almost all smallholder farmers.

Despite increased demand for honey both locally and overseas, there has been supply and quality constraints mainly due to challenges including deforestation, lack of skilled manpower, chemical over utilization and inadequate access to finance in honey supplies needed to meet the market demands. Moreover, under the current structure, the Honey subsector is categorized under the Meat and Dairy sector and lost its visibility.

That means, there should be due attention to the quality and independent certification system through formation of an independent agency by law. Since the Ethiopian Honey production is confined with the traditional honey and wax production, it suffered from lack of skilled manpower and poor quality assurance, the country is not getting as per its potentials.

Towards realizing its production, processing and exporting potentials, the study has put forward the following recommendations. One, finalizing and approving the Honey Marketing system and its legal framework Two, the pertinent government regulatory bodies have to give due attention towards product standardization, testing and grading system to improve the quality of honey supplied to the domestic and international markets. Three, expanding and strengthening farmers' cooperatives which collect and process honey from member beekeepers can be one of the strategies to minimize the difference between producers and retailers price of honey. Four, some of the key initiatives that have been implemented by The Ethiopian Agribusiness Acceleration Program (EAAP) under ATA could be used as a show case to make similar investment to transform the honey agribusiness and increase demand.

Finally transform the traditional honey production system by equipping with modern technologies and re-orient the subsector to a high quality pharmaceutical/medical, nutritional and cosmetic values of the products, invest in skill development and making strategic investments to achieve the desired objectives of the country.

3.1 Background

A new grant agreement signed between AACCSA and the GIZ has heralded the launch of a project entitled “Cluster support for the agricultural and food industries in Ethiopia” that is intended to benefit Agri-Business Companies. Cognizance of the Apiculture and Honey sub-sector’s potential and opportunities, AACCSA has initiated conducting a value chain study on the sub-sector so that businesses and interested bodies could engage in doing business in the sub-sector. Therefore, this study report, which is a collaborative work of AACCSA and Kilimanjaro Consulting PLC, has focused on Apiculture and Honey Value Chain.

In the process of conducting the value chain (VCs) study, focus has been made on review of the current status of the product, Government policy and strategies, collect relevant data including volumes & quantities produced and sold (to local market and export), prices, actors involved (i.e. producer cooperatives, distributors, retailers, etc.); undertake analysis of the major problems and constraints that value chain actors and business operators are facing; determining the relative position of the product in the country’s economy assessment on the opportunities. Moreover, recommendations has been provided on specific areas within the value chains having potential benefits for producers and actors within the chain and beyond.

3.2 Objectives and Purpose of the Study

The objective of the project is to form a better knowledge base on parts of the agriculture and food processing industry as a basis for investments in an environment dominated by lack of access to finance and foreign exchange.

The purpose of the project is to undertake Apiculture and Honey Value Chain Study in Ethiopia and generate valuable recommendations, which would help improve the performance of the sector. It also aimed to help develop and foster businesses related to agro-processing into tangible, presentable, and bankable business plans to attract investment in the sector and create jobs.

3.3 Scope of the Study

In the process of conducting the value chain (VCs) study, the team focuses on the specific tasks and works as given below which includes, among others, review of the status of the product, including, but not limited to the following:

- Review of Government policy and incentives related to apiculture;
- Determine the relative position of the product in the economy in terms of production and export;
- Collect relevant data, including volumes & quantities produced and sold (to local market and export), prices, actors involved (i.e. producer cooperatives, distributors, retailers, etc.);
- Undertake analysis of the major problems and constraints that value chain actors and business operators are facing;
- Collect and compile views of the sampled respondents to be reflected in recommendations in a manner that would help AACCSA package or design services (either BDS or advocacy) to its members; and
- Make recommendations on how the proposed value chain will be supported by policy and turn it into one of robust market orientation.

- Review and map the value chain and identify weaknesses at production, processing, technological, institutional (legal, regulatory and policy), market and final consumption levels.
- Assess opportunities and recommend specific areas within the value chain which have potential benefits for producers and actors within the chain and beyond and
- Undertake all tasks that are necessary to generate accurate and timely data as outlined in the ToR.

3.4 Methodology of the Study

3.4.1 Data Sources

Towards the achievement of the study objectives, the team used both secondary and primary data sources. The primary sources are Key Informant Interviews (KIIs), FGD and field observations. While the secondary sources are review of relevant theoretical and empirical literature, government policy and strategy documents, and time series data from national sources such as CSA and MO; and internal sources such as FAO.

3.4.2 Data Collection Methods

a) Secondary Sources

The study team have reviewed many relevant secondary documents from pertinent government, non-government, private sector institutions, including the Ethiopian Honey and Beeswax Producers' and Exporters' Association (EHBPEA) and have utilized their online resources as well. Review of literatures has been made in order to have relevant information on the value chain study, particularly on Apiculture and Honey.

b) Primary Sources

i) Key Informant Interview and Practical Observations

Primary data sources like (i) primary producers and producers' organizations (cooperatives) (ii) local buyers (iii) processors, (iv) Traders, (v) different service providers such as cooperative union, research and training institutes, federal, regional and local government offices etc. have been consulted and interviewed. The KIIs used to collect primary data from relevant key actors at different levels in the Honey value chain and has helped the team to make a situational analysis. Overall, the consulting team visited different offices in Addis Ababa and outside Addis Ababa. The consulting team has visited primary producers, processors at Yiregalem Integrated Agro-Processing Industrial Park (AIAIP) in Yirgalem/Abosto and Wondogenet Agricultural Research Institute (WARI) and made important practical observations of different sites, traditional and modern beehives. The lists of contacted participants and institutions are annexed (Annex 3 and 4).

ii) Focus Group Discussions (FGD)

Focus Group Discussion (FGD) has been conducted with staffs of honey producer and processor companies in Yiregalem Integrated Agro-Processing Industrial Park (AIAIP) in Yirgalem/Abosto. The discussion was recorded, transcribed and findings are used to triangulate findings based on other sources of data.

3.4.3 Data Analysis Methods

The collected secondary data were analyzed descriptively and the findings are presented in the body of the report in tabular and graphic forms as found appropriate and followed by detailed interpretation and discussions. Qualitative data on the other hand, are analyzed following thematic approach and used in supporting secondary data findings.

3.5 The State of Apiculture Sector

3.5.1 Production Potential

i. Agro-climatic Environment and Resource Potential

Ethiopia has huge apiculture and honey production potential, which is mainly due to the existence of forest with adequate apiculture flora and water resource, large bee colonies, farmers with indigenous knowledge, high socio-economic value for honey and high demand for honeybee products, rich culture and tradition of beekeeping, suitable environment with different agro ecology, farmers having indigenous knowledge, skills and keen interest to adopt improved technologies and taking beekeeping as a way of life are among the few to mention the potential to increase production

According to MoARD (2006), there are over 7000 melliferous plant species in Ethiopia serving as forage for bees and suitable for honey production, bimodal rains implying that honey can be harvested at least twice a year, five wild bee species, more than 2 million bee colonies in the forests and crevices in the country. In addition, there are some special stingless bees, which produce medicinal honey in the forest and farmland periphery¹¹. The diversified agro-climatic conditions is conducive for the growth of over 7000 species of flowering plants of which most are bee plants (MoA and ILRI, 2013)¹². Ethiopia has the largest bee population in Africa with over 10 million bee colonies, out of which 5 -7.5 million are estimated to be hived while the remaining exist in the wild (MoARD 2007; CSA 2009). According to CSA (2010/11)¹³, Ethiopia has the potential to produce up to 500 thousand tonnes of honey and 50 thousand tonnes of beeswax per year.

ii. Potential of Honey Producing Areas

Based on forage availability, agro-climatic conditions and agro ecological zone, honey production potential of areas of the country can be grouped into high, medium and low potential areas. The South-Western and Western regions of the country which include Kefa, Masha, Tepi, Dembi Dolo, Gerra, Limu, Metu, Yayu-Hurumu, and Seka Chekorsa are high honey production potential. The Southern, Southeast, Northwest and Central highlands of the country, which include most of the areas in West Gojam, South Gondar, West Shewa, Bale, Borena and Gofa are medium potential areas. Many of the districts in Tigray, Wollo and Hararge and other parts of the country which are covered with marginal forests are relatively low potential areas [(Fenet and Alemayehu, (2016) as quoted in Seble Tigistu(2020)¹⁴].

¹¹ MOARD (2006),

¹² MoA and ILRI 2013. Apiculture value chain vision and strategy for Ethiopia. Addis Ababa, Ethiopia: Ministry of Agriculture and International Livestock Research Institute.

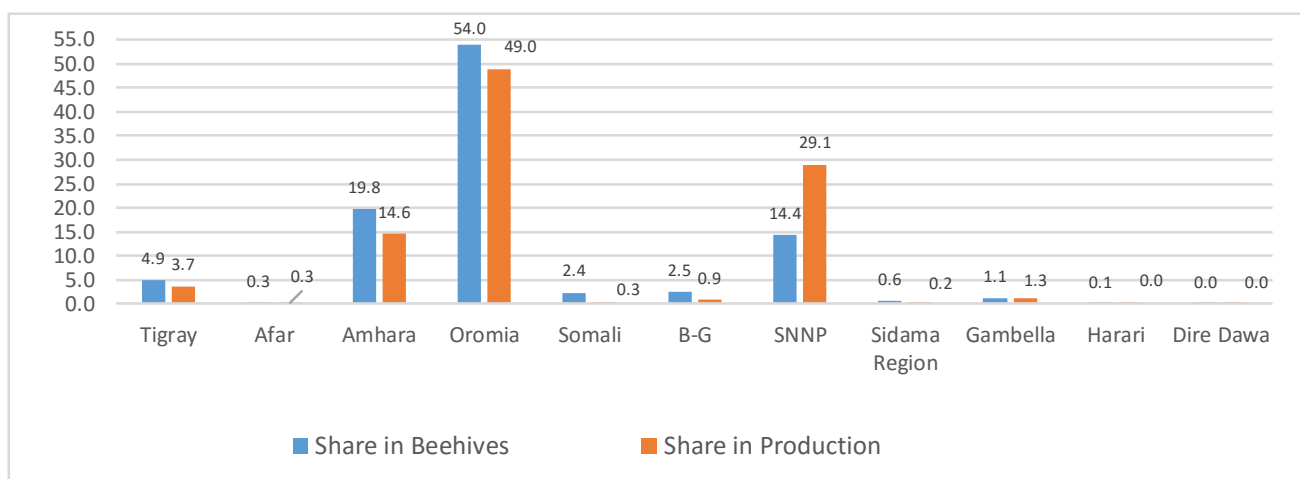
¹³ CSA(2010/11),

¹⁴ Seble Tigistu (2020), Review on Actors and their Value Adding Activities in Honey Value chain; Challenges and Opportunities in Ethiopia, he International Journal of Business Management and Technology, Volume 4 Issue 5 September – October 2020 ISSN: 2581-3889

iii. Major Honey Producing Regions

No country has such a long tradition of beekeeping than Ethiopia.¹⁵ Except areas with extreme weather conditions, beekeeping is practiced in almost all villages and by most smallholder farmers. According to USAID and AGP-made (2012)¹⁶, about 1.4–1.7 million households were engaged in apiculture sector producing honey using the traditional, intermediate and modern hives. This number has definitely increased since then but no data to support it. According to CSA (2021), Oromia, Amhara and SNNP are the top three regional states in terms of the number of beehives accounting for about 54 percent, 19.8 percent and 14.4 percent of the total beehives in the country, respectively. In terms of honey production; however, Oromia, SNNP and Amhara regions account for about 49 percent, 29.1 percent and 14.6 percent, respectively indicating higher productivity in SNNPR in yield per beehive relative to Amhara region (figure 1).

Figure1: Beehive ownership and production of honey by region, 2021



Source: calculated based on CSA, Report on Livestock and Livestock Characteristics (Private Peasant Holdings), 2021

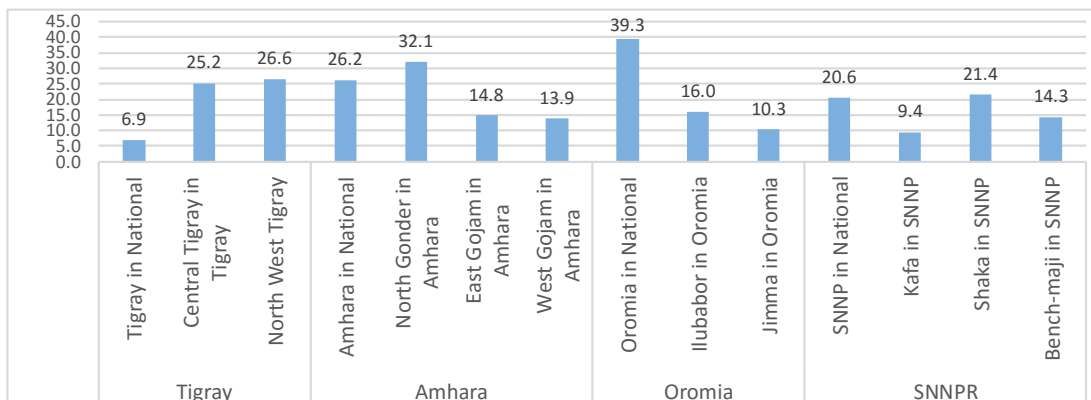
iv. Major honey producing zones within regions

According to CSA (2016/17), Oromia, Amhara, SNNP and Tigray regions account for about 39.3 percent, 26.6 percent, 20.6 percent and 6.9 percent of honey production, respectively. In each region, attempt is made to identify the major two or three zones, which produce high quantity of honey. In Tigray region, the major zones are North West Tigray and Central Tigray. In Amhara, North Gondar, East and West Gojam and in Oromia, Ilubabor and Jimma are the major producing zones. In SNNP region, Kafa, Shaka and Bench-Maji zones are important producer. All the major honey producing zones identified are found in the ideal agro-ecology environment that apiculture sector need. Hence, any investment in honey production sector could largely and profitability be carried out in these zones of the country (see figure 2).

15. Nebiyu Y, Messele T (2000) Honeybee Production in the three Agro ecological districts of Gamo Gofa zone of Southern Ethiopia with emphasis on constraints and opportunities. Agric Bia in AM 4:560-567

16. USAID (United States Agency for International Development), 2012. Agricultural Growth Program, Agribusiness and Market Development (AGP-AMDe) Project.

Figure 17: Regional share in total honey production and major zones with region, 2016/17



Source: CSA, Report on Livestock and Livestock Characteristics (Private Peasant Holdings), 2016/17

v. Production and Productivity

Despite its long history, the knowledge and skills used in the production, harvesting and processing of honey and beeswax by smallholder farmers is still very traditional. Bee keepings are practiced in forest, backyard, using traditional, transitional and improved beehives. Overall, honey is harvested during main season from October to December of the year. In the South and Eastern parts of the country; however, there is additional minor harvesting season between May-June (MoARD 2007).

Trends in honey production has shown no sign of change for over a decade in terms of the types of beehives used to produce honey, volume of production and the frequency of production per year in the country. In 2010/11, for instance, the share of traditional beehives in total beehives in the country was 96.4 percent, but remained at about 95.9 percent in 2019/20 thereby indicating absence of shifting towards more productive intermediate and modern beehives by smallholder beekeepers. The statistics shows that honey production from each types of beehives has remained exactly proportional to their shares in the number of total beehives indicating low productivity of intermediate and modern beehives, which, in turn, could be due to lack of production enhancing inputs such as forage. Over the decade, production of honey remained in the range of 53.7 - 66.2 million kgs per year but suddenly jumped to 129.3 million kgs in 2019/20. This jump was registered despite reduced number of beehives in that particular year thereby flagging concerns over the reliability of statistics for this particular year (see table 1).

Table 1: Trends in honey production by different beehives

	2019/20	2018/19	2017/18	2016/17	2015/16	2014/15	2013/14	2012/13	2011/12	2010/11
All Types of Beehives										
Number of Beehives, in '000	6,986.1	7,075.2	6,524.0	6,189.3	5,916.1	5,885.3	5,052.3	5,207.3	4,993.8	5,130.3
Production (in '000 Kgs)	129301.1	58588.2	66221.8	47706.1	50790.6	48711.9	43801.7	45905.2	39891.5	53675.4
Average Frequency (Harvests/Year)	1.66	1.6	1.59	1.64	1.62	1.63	1.6	1.61	1.55	1.55
Traditional Beehives										
Number of Beehives, in '000	6699.2	6794.4	6327.2	5902.6	5707.0	5663.5	4768.1	4996.9	4772.5	4944.4
Production (in '000 Kgs)	124791.3	54367.9	63798.1	42927.9	47352.6	44280.4	39831.8	41742.9	36487.9	51023.3
Average Frequency (Harvests/Year)	1.65	1.59	1.59	1.64	1.61	1.63	1.6	1.61	1.55	1.55
Intermediate Beehives										
Number of Beehives, in '000	103.0	80.2	69.4	80.8	70.8	71.9	47.7	55.0	81.6	41.7
Production (in '000 Kgs)	920.06	951.71	497.34	2036.97	1293.07	927.64	612.76	1086.99	475.86	387.45
Average Frequency (Harvests/Year)	1.73	1.62	1.63	1.94	1.95	1.67	1.44	1.65	1.57	1.65
Modern Beehives										
Number of Beehives, in '000	183.92	200.60	127.37	205.87	138.39	149.87	236.45	155.38	139.68	144.26
Production (in '000 Kgs)	3589.69	3268.52	1926.43	2741.21	2144.89	3503.89	3357.16	3075.31	2927.67	2264.61
Average Frequency (Harvests/Year)	1.74	1.76	1.69	1.58	1.64	1.62	1.56	1.52	1.56	1.52
Share, in %										
No of Traditional/All Beehives	95.89	96.03	96.98	95.37	96.46	96.23	94.37	95.96	95.57	96.38
Production from traditional/All	96.51	92.80	96.34	89.98	93.23	90.90	90.94	90.93	91.47	95.06
No of Intermediate/All Beehives	1.47	1.13	1.06	1.31	1.20	1.22	0.95	1.06	1.63	0.81
Production from Intermediate/All	0.71	1.62	0.75	4.27	2.55	1.90	1.40	2.37	1.19	0.72
No of Modern/All Beehives	2.63	2.84	1.95	3.33	2.34	2.55	4.68	2.98	2.80	2.81
Production from Modern/All	2.78	5.58	2.91	5.75	4.22	7.19	7.66	6.70	7.34	4.22

Source: Calculated based on CSA, Report on Livestock and Livestock Characteristics (Private Peasant Holdings) (2009/10-2020/21)

In terms of the average frequency (harvest per year), intermediate, modern and traditional beehives have registered 1.69, 1.62 and 1.6, respectively for over a decade thereby indicating absence of significant difference in frequency by beehives types. There is productivity difference across different types of bee hives. In 2018/19, for instance, the overall productivity of all beehives, traditional beehives, intermediate beehives and modern beehives are 8.3 kg/beehives, 8kgs/ beehives, 11.9kgs/ beehives and 16.3 kgs/ beehives, respectively. This shows that the productivity of modern beehives is double that of the traditional beehives but about 1.33 times that of the intermediate beehives (see table 1 above).

vi. Marketable Surplus and Marketing Channels

Marketable surplus is the amount of product sold by producers. According to CSA (2021)¹⁷ of the total honey produced by private smallholder farmers, the marketable surplus was about 58.5 percent in 2019/20. Honey was a product with the highest marketable surplus among the livestock products produced by private peasants in the same year.

Almost all honey in the country are produced by smallholder beekeepers who did not have the practice of further processing but sell crude honey to collectors in the nearest town/village markets, to traders or cooperatives at district or zonal levels, who, in turn, deliver the honey to various demanders either in their locality and/or transport it to the bigger honey dealers (verandah) in Addis Ababa market.

¹⁷ CSA (2021). Report On Crop And Livestock Product Utilization (Private Peasant Holdings, Meher Season) Addis Ababa May, 2021, volume VII , Statistical Bulletin 592

Although there could be variations from place to place, the majority of honey marketing chain takes the following sequences beekeepers, honey and beeswax collectors, retailers, wholesaler, tej brewers/ other processors and exporters.

3.5.2 Legal Framework, Policies and Institutional Mechanisms

i. Apiculture and Honey Development Policy 18

As indicated in GTP, the Ethiopian government development policy and strategy focuses mainly on raising agricultural output and productivity, promoting industrialization, huge investment in infrastructure and export promotion and diversification, and import substitution activities.

According to information from MOA, there is no apiculture sector policy but the ministry has been in the processing of drafting it. But there are apiculture sector development strategies, programs and plans aimed at encouraging beekeeping and business. There was also Apiculture Resources Development and Protection proclamation 660/2009, which deals with the conservation of the biodiversity of honeybee races and honey source plants and the development of the apiculture and the production of honey products.

Increasing productivity and incomes of very large and small-scale commercial apiculture sector is part of the long term vision of the country. By giving increasing attention on the promotion of modern technologies in the subsector, the policy environment and the evolving institutional framework are creating opportunities for the development of the honey and beeswax value chains.

In order to address the macroeconomic imbalance, sectoral and structural problem constraining the development of the economy, the home-grown economic reform ¹⁹ was designed and implemented since March 2018. Of which, export sector development is the major areas of government's attention. Within this areas apiculture sector development was implicated. In the national Ten Year Perspective Plan²⁰, livestock sector and apiculture sub-sector have got due attention. Apiculture product export is planned to dramatically increase every year over the next ten years to that the sector will benefit from various incentive schemes.

ii. Apiculture sector related Policies, Strategies and Programs

Coherence in policies has paramount importance for effective implementation in since policies issued to promote one sector might have positive or adverse implications for others. In this regard, attempt is made to assess whether there are policies and programs issued for other sectors that have bearings for beekeeping activities. Of the related policies, the Forest Development, Conservation and Utilization Proclamation in 2017, which aims to promote sustainable development, conservation and utilization of forest and forest resources, through promotion and recognition of community ownership and public participation; export development policy which promotes diversified and competitive economy and encourages value-addition to primary exports and investment proclamations, which provides generous incentives for investment in general and exporting sectors in particular, etc., are the major ones.

18. MoA and ILRI. 2013. Apiculture value chain vision and strategy for Ethiopia. Addis Ababa, Ethiopia: Ministry of Agriculture and International Livestock Research Institute.

19. Homegrown economic reform program

20. Ten year perspective plan

Ethiopian's apiculture sector and its contribution to poverty reduction have been recognized. It has been incorporated into the working agenda of the Government of Ethiopia, especially the Ministry of Agriculture (MoA), National Research Centers (Holeta, Andasa), and various nongovernmental organizations (NGOs), such as SNV (Netherlands Development Agency), Oxfam GB, and SOS Sahel. In addition, the Ethiopian Honey and Beeswax Producers and Exporters Association (EHBPEA) and the Ethiopian Beekeeper's Association (EBA) cooperate with the government to organize commodity-specific workshops, find solutions to industry problems, facilitate apiculture sector development policy, and organize conferences and international honey expositions (e.g., ApiExpo).

Ministry of Agriculture, the Federal Cooperative Agency (FCA), and Holeta beekeeping research center and Ethiopian Apiculture Board (EAB) are the major service providers that are shaping the honey sector. The cooperative agency assists in establishing cooperatives and further development through marketing and market linkages. MOA and regional agriculture development bureaus encourage the formation of cooperatives, train cooperatives about the different types of honey qualities. In addition, they facilitate access to credit from microfinance institutions while offering technical assistance. The Holeta Bee Research Centre of Oromia Regional State has been undergoing research on beekeeping technologies since 1996. An important body of basic research has been completed, principally at Holeta, covering bee biology, bee botany, bee health, apiary management and bee products. Apart from Holeta, regional livestock research centers at Sekota, Pawe, Andassa, Sinana, Adami Tulu, Yabello, Bako, Bonga, Jinka, Mekele and Srinka have started work on beekeeping. However, these centers have been suffering from acute shortage of trained manpower and facilities. As the result so far research has contributed less to real innovation in beekeeping; innovation in the sense of turning knowledge into improved productivity and incomes.

iii. Apiculture Sector Development Plan

The vision of the sector is to become a major supplier of honey, beeswax and other high value hive products in the domestic and international markets.

To realize the vision and the strategy the bottlenecks need to be overcome through the strategic interventions the desired outcomes can be achieved by concerted and integrated efforts of the range of stakeholders in the value chain.

iv. Targets to 2025

Highlights of Targets put to 2025 include the following:

- Increase honey production from the present level of approximately 50 thousand tonnes to 200 thousand tonnes and beeswax production from 3800 t to 12 thousand tonnes by end of 2025.
- Increase honey export from the existing approximately 400 t to 2400 t by end of 2025.
- Increase beeswax export from the existing approximately 400 to 1000 t by end of 2025 while doubling production and exporting of all high value hive products.
- Increase export revenues of honey from the current estimated USD 1.5 million to USD 8 million and beeswax from the current estimated USD 1.4 million to USD 5 million by the end of 2025.

The main underlying assumptions include, adopting improved production techniques, improved harvest and management, strengthen research and extension, timely supply of inputs, supported farmers to access finance and overcome negative effects of climate change and considered niche markets to be identified through market linkages by acquiring unique selling points like certifications and development of special brand for Ethiopian honey.

3.5.3 Economic Importance and Performance of the Apiculture Sector

i. Economic Importance

In Ethiopia, beekeeping is an important component of agriculture and rural economy. It is a non-land-based activity and does not compete with other resource demanding farming systems (FAO, 1990). Beekeeping has played significant role in the national economy. In 2019/20, for instance, the country produced about 129.3 tonnes of honey, partly consumed as food by beekeepers and partly sold in the market. All actors along the whole value chain up to retailers in the sector generate income from each activity. It also generates direct and indirect employment for the population. According to USAID (2012) around 1.4–1.7 million farm households are engaged in this sector by using the traditional, intermediate and modern hives (USAID, AGP-AMDe, 2012). The sector also generates foreign exchange for the country. In 2019, for instance, the country has generated foreign exchange of about US 0.5 million Dollars and US 2.1 million Dollars from natural honey and bees wax exports, respectively. The government has also benefited by collecting tax from all actors along the value chain. Moreover, honey and beeswax are raw materials for various industries that manufacture products like beeswax-candles; lubricants, etc. On the other hand, manufacturing industries provide pesticide, forage, equipment and machinery for the sector thereby strengthening backward and forward linkages between agriculture and industry.

The other economic value of the apiculture emanates from its pollination service. Bees are essential parts of the agricultural system and are the prime pollinating agents. The sector is universally conceived as the one which naturally play a key role in improving biodiversity increasing crop production through pollination. Although difficult to exactly quantify bees pollination service, it is estimated to worth over 15 times the value of all hive products put together.²¹ In Ethiopia, an experiment was conducted to determine the effect of pollination on Niger (*Guizotia Abyssinia*). The study showed that honeybees increased seed yield of Niger by about 43%²² and Onion (*Allium Cepa*) by two fold.²³ Honey bee pollination service not only maximizes agricultural crop production but also increases the honey yield harvested from the hive because honey bees collect more nectar and pollen while they pollinate. The economic value of pollinators for some agricultural crops for Ethiopia was estimated to be US 815.0 million dollars. The regional distribution shows Oromia and Amhara regional states being ranked the first and second to benefit from biological pollinators in the country.²⁴ In the absence of the pollinators, the economic value may drop by 16 percent.²⁵

21. Ethiopian Agricultural Research Organization. Apiculture research strategy. Animal Science Research Directorate, Ethiopia; 2000:30–42.

22. Admasu A, Nuru A. Effect of honeybee pollination on seed yield and oil content of Niger (*Guizotia abyssinica*). Proceedings of the first National Conference of Ethiopian Beekeepers Association. Ethiopia; 2002. p. 67–73.

23. Adimasu A, Gizaw E, Amsalu B, et al. Effect of Honeybee pollination on seed *Allium cepa*: Holetta Bee Research Center, Ethiopia. *Eth J Anim Prod.* 2008;8(1):79–84.

24. Alebachew WG. Economic value of pollination service of agricultural crops in Ethiopia: Biological Pollinators. *J Apic Sci* 2018; 62(2): 265–73.

25. Bারেके T, Addi A. Effect of honeybee pollination on seed and fruit yield of agricultural crops in Ethiopia. *MOJ Eco Environ Sci* 2019; 4(5): 205–9.

3.5.4 Honey Production and Export: Comparative Analysis

i. Global Natural Honey Production and Export

The global natural honey production has increased from 1588.1 thousand tonnes in 2010 to 1852.6 thousand tonnes in 2019 growing on average by 1.75 percent per annum over the period. African natural honey production has also increased from 167.9 thousand tonnes in 2010 to 189.9 thousand tonnes in 2019 showing an average annual growth rate of 1.65 percent over the same period depicting slightly lower growth compared to world average.

Except Kenya which has manifested significant growth in the production of honey, averaging 22.5 percent per annum; the production of natural honey by Ethiopia, Egypt and South African, the major producers of natural honey in Africa, has remained, more or less, at the same level depicting zero growth rate over the same period (see table 2).

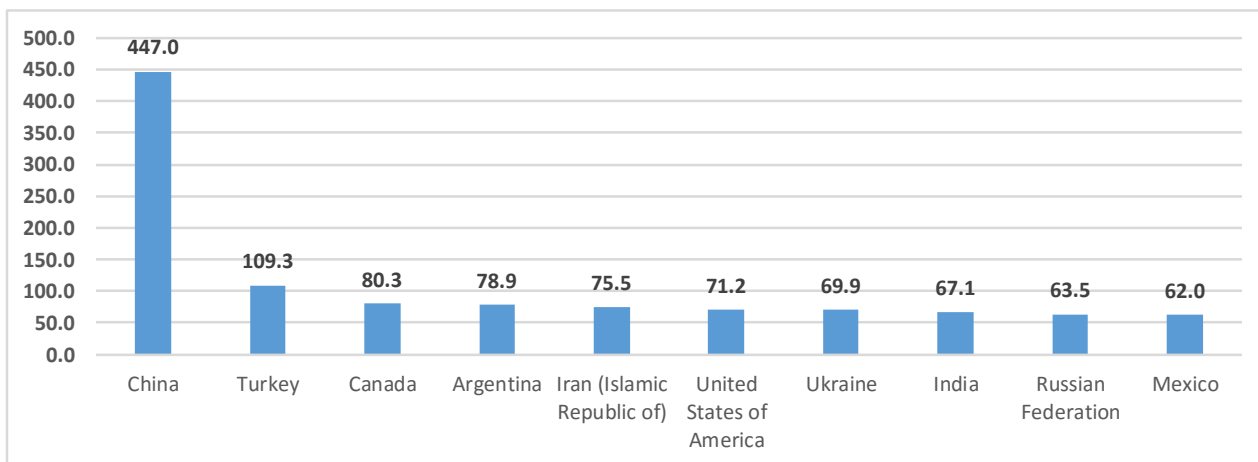
Table 2: Natural honey production volume, growth and shares in (Percentage)

Groups/Countries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual average, (2010-19)	
												Quantity, in 000 tonnes
World	1588.1	1657.6	1697.9	1736.5	1814.7	1877.2	1926.0	1926.3	1882.0	1852.6	1795.9	
Africa	167.9	156.6	165.8	169.6	194.2	214.1	198.7	184.1	191.0	189.9	183.2	
Ethiopia	53.7	39.9	45.9	48.9	50.0	59.2	47.7	50.0	50.0	53.8	49.9	
Egypt	6.03	5.68	5.07	5.41	5.44	4.95	4.38	4.15	5.49	5.59	5.22	
Kenya	8.9	9.79	11.65	8.25	29.74	34.76	25.57	18.09	20.53	13.88	18.12	
South Africa	1.08	1.05	1.08	1.09	1.08	1.08	1.08	1.08	1.08	1.08	1.08	
		Annual growth rate, in %										
World		4.38	2.43	2.27	4.51	3.44	2.60	0.01	-2.30	-1.56	1.75	
Africa		-6.72	5.87	2.28	14.50	10.29	-7.19	-7.39	3.75	-0.57	1.65	
Ethiopia		-25.68	15.07	6.61	2.16	18.32	-19.36	4.81	0.00	7.56	1.06	
Egypt		-5.79	-10.81	6.69	0.70	-9.08	-11.58	-5.21	32.38	1.71	-0.11	
Kenya		10.00	19.00	-29.18	260.51	16.87	-26.43	-29.27	13.47	-32.39	22.51	
South Africa		-2.96	2.86	0.56	-0.18	-0.28	0.00	0.00	0.00	0.09	0.01	
		Share in %										
Ethiopia/ World	3.38	2.41	2.70	2.82	2.76	3.15	2.48	2.60	2.66	2.90	2.78	
Ethiopia/ Africa	31.97	25.47	27.69	28.86	25.75	27.63	24.00	27.17	26.18	28.32	27.31	
Ethiopia/Egypt	945.0	787.4	849.3	899.2	1010.3	1351.9	1150.1	910.6	895.3	1030.9	983.0	
Ethiopia/Kenya	603.1	407.5	394.0	593.2	168.1	170.2	186.5	276.4	243.6	387.6	343.0	
Ethiopia/South Africa	4960.7	3799.2	4250.5	4506.5	4612.5	5472.8	4413.1	4625.3	4625.3	4970.6	4623.7	

Source: calculated based on FAOSTAT, based computation

In 2019, China ranked the first among honey producing countries across the world producing about 447 thousand metric tons of honey followed by Turkey, Canada, Argentina, Iran, USA, Ukraine, India, Russia and Mexico in order of importance. Despite her huge production potential, Ethiopia has not managed to be among the top ten producing country across the globe (see figure 3).

Figure 3: Top Ten Natural Honey Producers in the world in 2019, volume in ‘000 tons

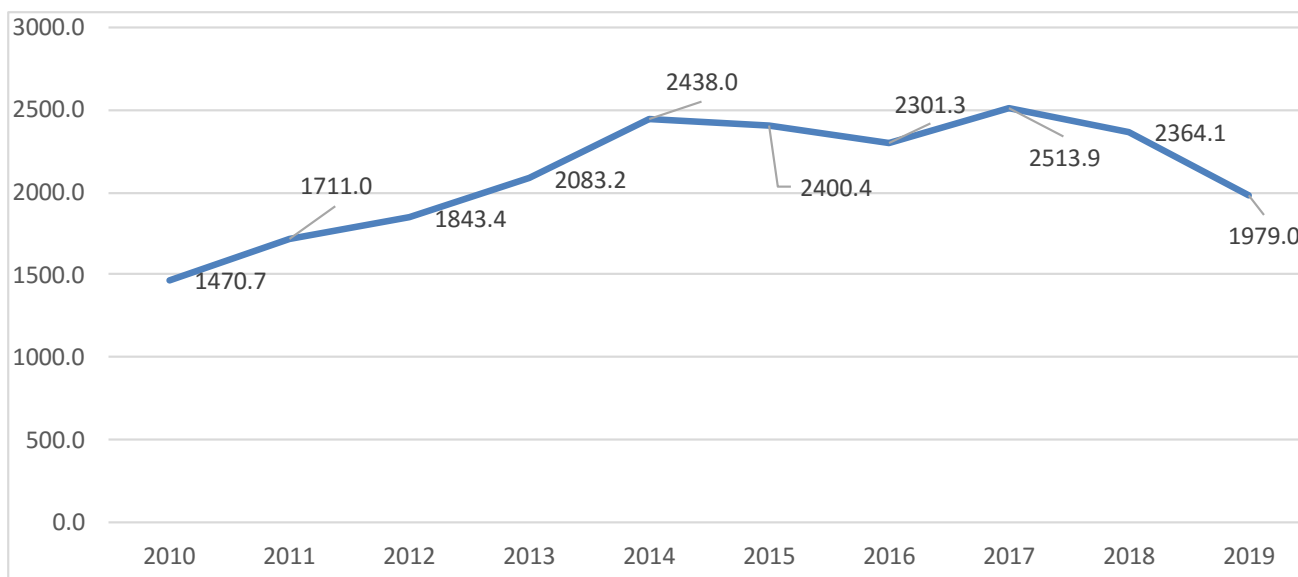


Source: FAOSTAT,

ii. Trends in Global Natural Honey Export

Exports of natural honey has increased from 1470.7 tonnes in 2010 to reach maximum of 2513.9 tonnes in 2017 but declined since then and reached 1979 tonnes in 2019. The trend in the global natural honey export has followed the trends in honey production (see figure 4).

Figure 18: Trends in the Global Natural Honey Export



Source: Calculated based on WITS/World Bank database

iii. Global Honey Market Projections²⁶

The global market for natural honey was estimated at US 9.21 billion Dollars in 2020. The global honey market is expected to grow at a compound annual growth rate of 8.2% from 2021 to 2028 to reach USD 17.34 billion by 2028. The major factor driving the market includes high demand for nutritious food products, honey being an excellent source of numerous nutritional ingredients including vitamins, minerals, calcium, and antioxidants. and rising awareness about the benefits of maintaining a healthy lifestyle. Moreover, honey has several medicinal properties and can help improve metabolic activities,

26. <https://www.grandviewresearch.com/industry-analysis/honey-market>

maintain blood pressure levels, reduce the risk of diabetes, and can even heal burn wounds. It is widely used in many applications apart from food & beverages such as cosmetics and pharmaceuticals.

More specifically, the demand for organic honey has been increasing. The global organic honey market which was U.S. 606.2 million dollars in 2019, forecasted to reach U.S 923.6 million. Dollars by 2025 .²⁷ Ethiopia is already in EU honey and wax market where organic honey has a high demand. Besides, honey is one of the Fairtrade products .²⁸ Many beekeepers have also used the Fairtrade Premium to switch to organic cultivation. Thus, there is potential for Ethiopian farmers to benefit from Fair-trade premium.

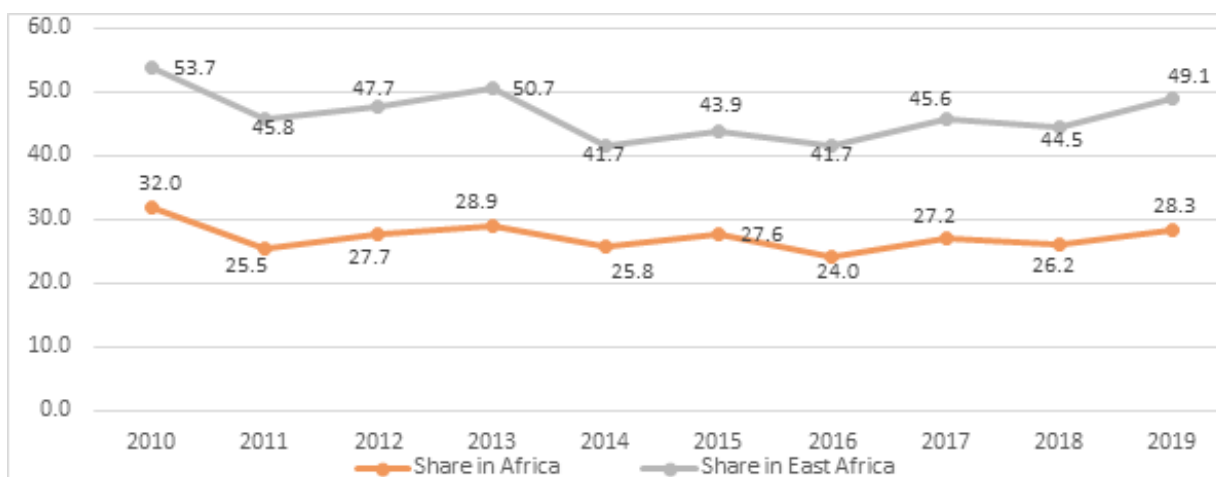
iv. Honey Production in Africa

Beekeeping in Africa dates back almost 5000 years. Beehives were first used to produce pure honey in ancient Egypt; as a delicious human delicacy and also, as gift to the gods during the burial processes (unctad.org. 2012). However, very little has changed since then in terms of the mode of production and productivity, processing and marketing. Africa’s natural honey production has increased from 167.9 thousand tonnes in 2010 to 189.9 thousand tonnes in 2019 indicating an average growth rate of 1.65 percent per annum over the period. Africa’s share in the world natural honey production volume remained at about 10.2 percent over the same period depicting stagnation in the continent’s position despite its significant potential relative to other continents (see table 2 above).

3.5.5 Ethiopia and African Countries: Comparative Analysis

Ethiopia has accounted, on average, for about 46.4 percent and 27 percent in Africa and East Africa total natural honey production, respectively, over the period (2010-2019). Ethiopia’s production as share of Africa and East Africa have declined to 28.3 percent and 49.1 percent in 2019 from its levels of 32 percent and 53.7 percent in 2010, respectively depicting relatively better performance by other African countries. This performance turns against its comparative advantage and potential in natural honey production. (see figure 5).

Figure 5: Trends in Ethiopia’s share in honey production in Africa and East Africa



Source: Computed based on FAO database, <http://www.fao.org/faostat/en/#search/natural%20honey>

27 Global organic honey market value 2019 & 2025 Published by Nils-Gerrit Wunsch, Nov 26, 2020

28 The Fairtrade model requires companies to pay fairer prices to small-scale producers, while also holding producers to higher ethical and environmental standards, which protect labourers’ rights and the environment.

i. Global Natural Honey Export

According to the world bank , ²⁹in 2019, the top exporters of Natural Honey were China (\$235,314.29K, 120,845,000 Kg), New Zealand (\$230,182.52K, 8,438,700 Kg), Argentina (\$142,086.24K, 63,521,900 Kg), Germany (\$138,680.91K, 26,317,300 Kg), European Union (\$133,307.87K, 20,236,500 Kg).

ii. Africa's Natural Honey Export

In 2019, the top 5 natural honey exporting African countries in terms of export receipts were Egypt, South Africa, Zambia, Kenya and Ethiopia in order of importance. Ethiopia's fifth position is contrary to its being the top producer of natural honey in Africa. Although Ethiopia exports more honey relative to Kenya it gets lower receipts due to relatively lower international price for Ethiopian sourced honey, which, in turn could be due to lack of certification, branding of honey, lack of well-established marketing networking, foreign investors in the sector, low commercialization of the farming system, etc. (see table 3).

Table 3: Major Natural Honey Exporting African Countries, 2019

Countries	Value, in 000 USD	quantity, in tonnes
Egypt, Arab Rep.	5,596.46	2,471.32
South Africa	2,421.62	565.85
Zambia	2,309.14	732.41
Kenya	920.36	117.00
Ethiopia	627.00	153.00
Morocco	274.27	8.46
Madagascar	240.31	92.54
Mauritius	26.84	1.67
Senegal	19.93	3.69
Rwanda	15.44	5.31

Source: WB/WITS

3.5.6 Ethiopia Natural Honey Exports

Honey has been one of the country's source of foreign exchange since long period of time. In 2019/20, about 152.1 thousand kgs of honey was exported. Of the total production, the share of export has been declining overtime, especially since 2015/16. For instance, the share of export which was 2.52 percent in 2011/12 has declined to 0.23 percent in 2019/20, which could be due to increased domestic consumption, inability to meet export standards, etc. Over the period (2010/11-2019/20), the average share of export to total produced refined honey remained at about 1 percent and the volume of export has declined, on average, by 7.4 percent per annum. In 2010/11, for instance, the share of honey and beeswax in the total merchandise export receipts of the country was 0.13 percent, 0.11 percent in 2018/19 but declined to 0.09 in 2019/20 indicating deterioration both in relative and absolute terms (table 5). This goes contrary to the country's high resource endowment/potential for honey production, deep rooted practice of honey production, increased number of commercial firms joining honey production and export, and market access opportunities offered by various countries, etc. (see table 4).

29 . WITS/World Bank database

Table4: Trends in the Export Performance of Apiculture

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Production, crude in kg	387,450	475,855	1,086,990	612,758	927,639	1,293,068	2,036,969	497,337	951,706	920,058
Production, pure in kg	283,420	348,088	795,133	448,232	678,568	945,879	1,490,043	363,802	696,173	673,022
Export, in '000kgs	520.30	876.66	839.54	742.35	681.18	592.53	444.10	316.30	134.43	152.14
Share in %										
Export/pure honey	1.84	2.52	1.06	1.66	1.00	0.63	0.30	0.87	0.19	0.23
Growth rate, in %										
Export volume	-7.40	68.49	-4.24	-11.58	-8.24	-13.01	-25.05	-28.78	-57.50	13.18
Export receipt, in Million Birr										
Bees wax	29.13	37.33	47.78	52.05	95.73	51.33	60.57	81.31	67.66	65.66
Honey	26.79	56.00	52.87	47.23	46.14	41.93	31.34	23.69	13.47	16.44
Honey and Bees wax	55.92	93.33	100.64	99.27	141.87	93.25	91.91	105.01	81.13	82.09
Total Mechandise Export	44,525.6	54,494.8	56,123.6	62,243.0	59,860.4	59,725.8	63,685.7	72,713.0	73,574.2	94,240.5
Quantity in Metric Ton										
Bees wax	362.51	367.09	411.93	334.70	520.38	267.65	302.34	358.70	283.18	258.01
Honey	520.30	876.66	839.54	742.35	681.18	592.53	444.10	316.30	134.43	152.14
Unit value(value per Metric ton)										
Bees wax	0.08	0.10	0.12	0.16	0.18	0.19	0.20	0.23	0.24	0.25
Honey	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.10	0.11
Share in total export(in %)										
Bees wax	0.065	0.069	0.085	0.084	0.160	0.086	0.095	0.112	0.092	0.070
Honey	0.060	0.103	0.094	0.076	0.077	0.070	0.049	0.033	0.018	0.017
Honey and Bees wax	0.126	0.171	0.179	0.159	0.237	0.156	0.144	0.144	0.110	0.087
Growth in Export receipt(in %)										
Bees wax		28.17	27.98	8.93	83.93	-46.38	18.00	34.25	-16.79	-2.96
Honey		108.99	-5.59	-10.67	-2.30	-9.13	-25.24	-24.40	-43.16	22.06
Honey and Bees wax		66.90	7.84	-1.36	42.91	-34.27	-1.44	14.25	-22.74	1.19
Total Mechandise Export		22.39	2.99	10.90	-3.83	-0.22	6.63	14.17	1.18	28.09
Growth in volume(in %)										
Bees wax		1.26	12.22	-18.75	55.48	-48.57	12.96	18.64	-21.05	-8.89
Honey		68.49	-4.24	-11.58	-8.24	-13.01	-25.05	-28.78	-57.50	13.18

Source: calculated based on data from CSA and NBE

NB: According to Nuru Adgaba and Eddosa Negara (2004), Profitability of processing crude honey; the percentage of pure honey obtained from crude honey varies from 34.4 % to 95.0% averaging 73.15%. Hence, 73.15 percent is used to calculate pure honey which is comparable to export honey

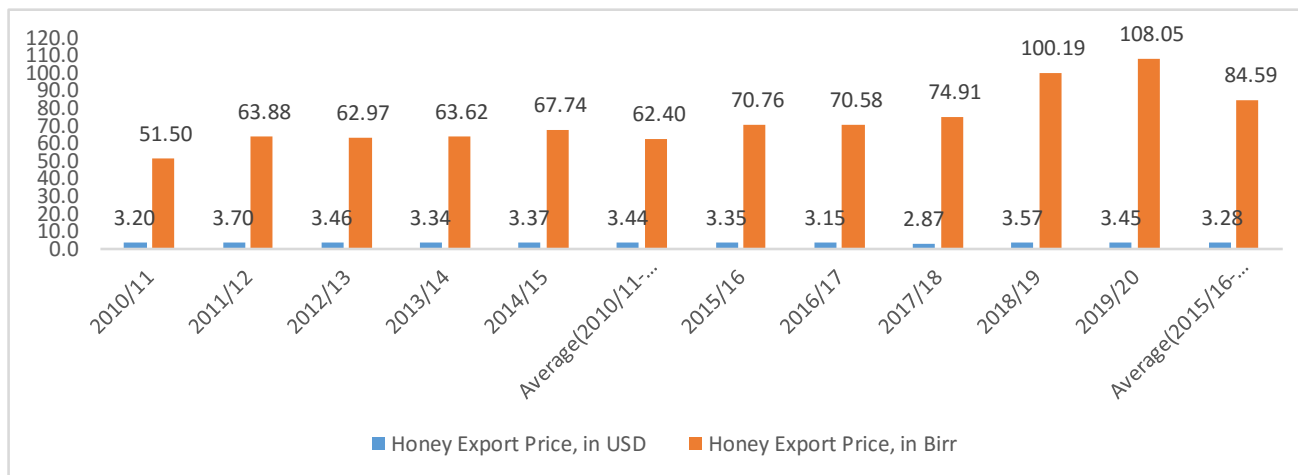
i. Export and Domestic Prices for Natural Honey

Ethiopian natural honey which was US 3.2 Dollars per kg (51.5 birr equivalent) in 2010/11 has slightly increased to US 3.45 Dollars/kg (108.1 birr equivalent) in 2019/20 (figure 6). Selinawamuci³⁰ in 2021 showed that the approximate price range for Ethiopia’s natural honey ranged between US 2.54- 4.1 Dollars per kilogram.

Normally, the domestic price of honey varies by place, types and quality of honey sold in the domestic market. According to field visit in Addis Ababa in May 2021, the domestic price for export standard natural honey ranged from 400-800 Birr, averaging at about 600 Birr/kg (US 15 Dollars per kg). The US 4.1 Dollar price for Ethiopian natural honey in the export market in the same year is 3.5 times lower than the domestic price thereby compelling exporters to channel their products into domestic market. Before some years, the domestic price of honey has been lower than export price, however, since recently, due to high and persistent inflation, the domestic price of honey has become higher than export prices.

30 Selinawamuci, Export market prices for Ethiopia natural honey; <https://www.selinawamucii.com/insights/prices/ethiopia/natural-honey/> accessed 30 June 2021]

Figure 6: Trends in Export price (export unit value) for honey, USD per kg and Birr per kg



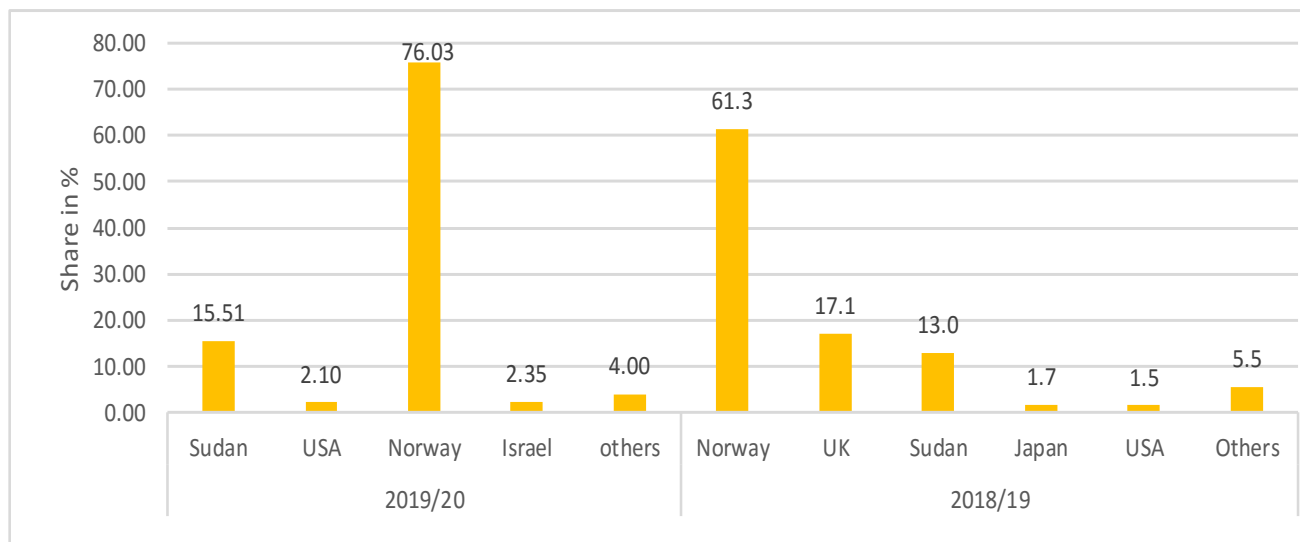
Source: Computed based on time series data from NBE

According to key informants, the decrease in volume of honey export can be attributable to the relatively higher local price to export price, adulteration and failing to meet export standards, increased consumption of honey in the local market, which, in turn, is due to expanding urbanization, population growth and betterment of life of citizens due to economic growth, increased middle income group and substituting sugar for honey in many food staff preparation, increased honey demand for medicinal purpose, illegal cross boundary trade, etc. Furthermore, the requirements for quality control, traceability and certifications needed to access international markets may well be considered as additional burdens that do not pay off considering the low export market pricing. Yet a few honey processors and exporters have managed to certify their products and are able to penetrate international markets.

ii. Honey Export by Countries of Destination

Ethiopia has been exporting honey to different countries across the world. In 2018/19, Ethiopia’s major destinations of natural honey export were Norway (61.3 percent), UK (17.1 percent) and Sudan (13 percent) in order of importance. In 2019/20, the share of Norway has significantly increased to reach 76 percent and Sudan became second accounting about 15.5 percent of the total export depicting the concentration of Ethiopian honey exports into two countries, which, in turn, carries risks and hence require further endeavor for diversification of export destinations (figure 7).

Figure 7: Honey Export by major countries of destination



Source: Calculated based on raw data from Ethiopian Customs Commission (ECC)

3.5.7 GTP Target versus Actual Performance of Apiculture Sector

The government has set target for apiculture for 2025 in its development plan. According to which, the number of smallholder beekeepers, the quantity of honey production, the quantity of honey export, the quantity of beeswax export, revenue from honey export and export revenue from beeswax were targeted at 2.8 million, 200 tonnes, 2400 tonnes, US 8 million Dollars and us 5million Dollars, respectively. The actual performance for 2019/20; however, shows 50 percent, 64.7 percent, 6.3 percent, 25.8 percent, 26.3 percent and 10.5 percent, respectively showing relatively better in production performance but the least in volume of export (table 5).

Table 5: The 2019/20 Performance against Target for 2025

Particulars	Target for 2025	2019/20	% from Target
Number of smallholder beekeepers , in milli	2.8	1.4	50.0
Honey production, in 000 tonnes	200.0	129.3	64.7
Honey export , in tonnes	2400.0	152.14	6.3
Beeswax export , in tonnes	1000.0	258.01	25.8
Export revenues of honey, in million USD	8.0	2.1	26.2
Export revenues of beeswax, in million USD	5.0	0.5	10.5

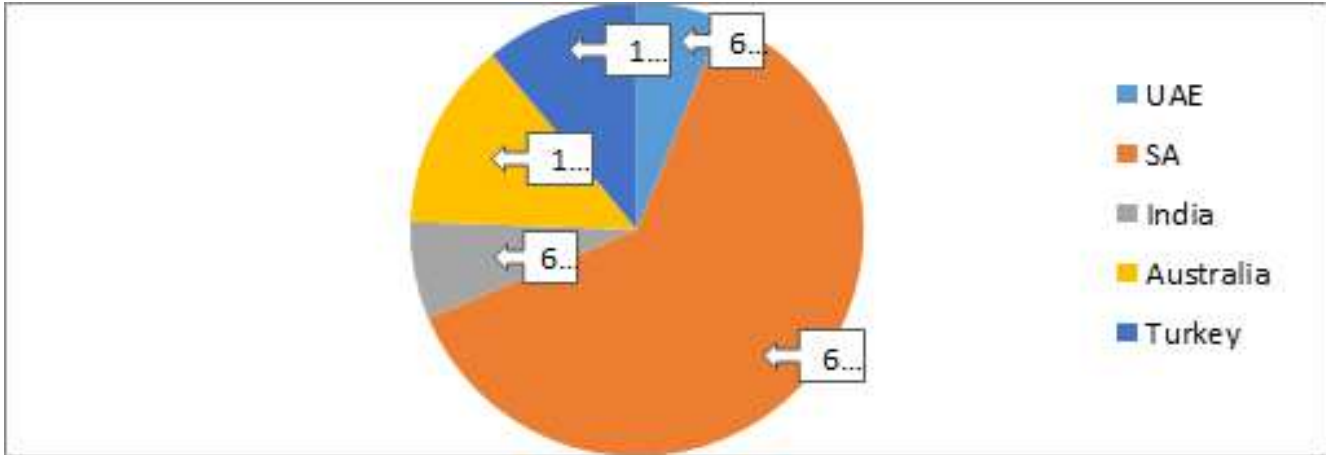
Source: Computed based on CSA, Report on Livestock and Livestock Characteristics (Private Peasant Holdings) 2019/20, and Growth and Transformation Plan (MoFED 2010).

3.5.8 Honey Imports into Ethiopia

Though well-known producer and exporter, Ethiopia also imports natural honey. The country imported natural honey amounting about 3.73 thousand kgs, which is estimated at about 366.1 thousand Birr in 2019/20. However, it is insignificant and most imports were one time import, it could also be samples or imported for star hotels, big supermarkets from where foreigners living in the country and high income Ethiopian citizens purchase brand and high quality merchandize and imported by foreign citizens living

in Ethiopia importing honey from their countries. In terms of countries of origin, South Africa, UAE and Turkey were the top three import origins accounting for about 62.3 percent, 13.4 percent and 11 percent, respectively (see figure 8).

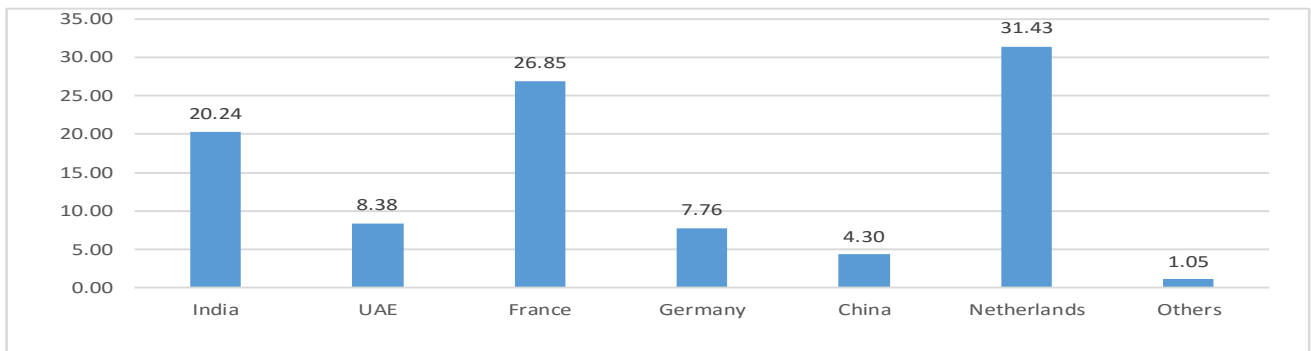
Figure 8: Natural honey imports into Ethiopia by countries of origin



Source: ECC

Despite its natural resource endowment, production and exporting of natural honey, the country has been importing artificial honey. The country has imported artificial honey amounting 19.5 million birr in 2019/20. Countries of origin for the artificial honey were Netherlands, France, India, and UAE and Germany accounting for about 31.4 percent, 26.9 percent, 20.2 percent, 8.4 percent and 7.8 percent, respectively in 2019/20 (figure 9).

Figure 9: Artificial Honey Import by Countries of Origin



Source: ECC

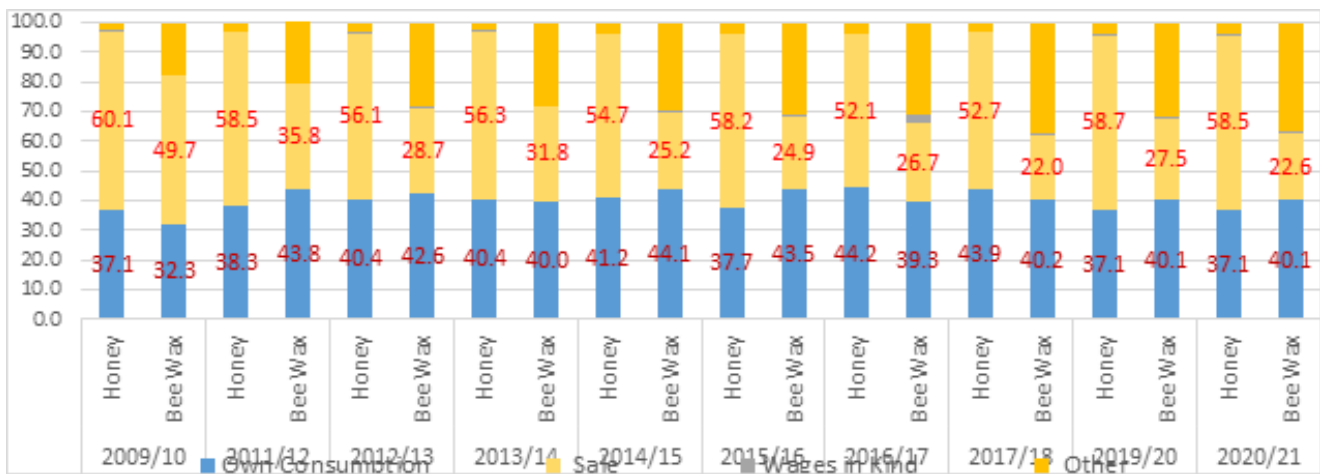
3.5.9 Honey Consumption

The consumption of honey (in different forms) starts right from beekeepers to importing countries' consumers. Customarily, the farming households consume a share of what they produce and sell the remaining balance. Of the total honey produced in 2021,³¹ about 37.1 percent, 58.46 percent and less than 1 percent were used for household consumption, market for sell, and used as payment (wage

31. This report does not include honey production from commercial farmers, which are fully for commercial purpose, and urban beekeepers (though they are insignificant and risky place to keep hives and quality may turn poor since bees may use poor quality water and forage in towns).

in kind), respectively. During the same year, of the total beeswax produced, about 40.1 percent was consumed on the farm while 22.6 percent was for sale; the balance went to effect wage in kind and other purposes. On average, about 40 percent of honey and 40.6 percent of beeswax have been used for own consumption by beekeepers and 56.6 percent of honey and 29.5 percent of beeswax have been sold in the market over the period (2009/10- 2020/21). The balances have been used as wage in kind and other purposes. Trends in honey consumption by producers/honey keeping households have remained more or less the same for over a decade. In 2009/10, for instance, own consumption by producers was about 37.1 percent of the total production, in 2019/20, yet it remained at 37.1 percent indicating unchanged consumption pattern over longer period. However, the share of bees wax for own consumption by producers has shown slight increase. For instance, the share of own bees wax consumption by producer was 32.3 percent in 2009/10 but the share increased to reach about 40.1 percent after a decade (see figure 10).

Figure 10: Honey and Beeswax Utilization by Holders in % of total production



Source: CSA, Crop and Livestock Product Utilization (Private Peasant Holdings, Meher Season, (various Issues)

According to USAID (2012),³² only about 2 percent of the total yearly production being exported. The share of export in total honey production has declined significantly falling below 1 percent in 2019/20 indicating that over 99 percent of the total honey production is consumed locally. The estimate seems understated since the export data used here is refined honey while production data is crude one. In fact, one may use refined production instead of crude honey by using some conversion factor (see table 1). This study found similar result as that of USAID (2012). As mentioned in table 3 above, of the total honey produced in 2019/20, only 0.23 percent (less than a percent) is exported implying the balance (more than 99 percent) being challenged into domestic consumption. In addition, there are natural and artificial honey imports into Ethiopia adding to the total domestic consumption.

According to Mikhail Miklyaev et al (2013) , annual honey consumption in Ethiopia is estimated at 10 kg per household, the average household size according to Mikhail Miklyaev was six persons. Thus, the per capita annual honey consumption is estimated at about 1.67kg.

32. USAID., 2012. Cost-Benefit Analysis of the Honey Value Chain in Ethiopia, Graduation with Resilience to Achieve Sustainable Development - Grad Project Final Report

3.6 Apiculture Sector Challenges: Production, Processing and Export

3.6.1 Challenges of Production

The major challenges facing production are: - Dependence on technologies of low productivity resulting from undeveloped research; poor pre- and post-harvest management; inadequate capacity building and extension service; limited knowledge of modern apicultural development; inadequate access to finance by smallholder farmers; negative impact of climate change (habitat destruction), and lack of market information for both honey and beeswax.

i. Challenges of Processing

The major challenges facing processing of honey are: limited number of industrial honey processors; lack of good quality honey supply for processing; lack of access to inputs; lack of required volume of products for processing to use the installed capacity and meet quantity demanded by clients; lack of skills and knowledge of food safety and hygiene among beekeepers and processor and processing-quality and safety.

ii. Challenges of Exporting

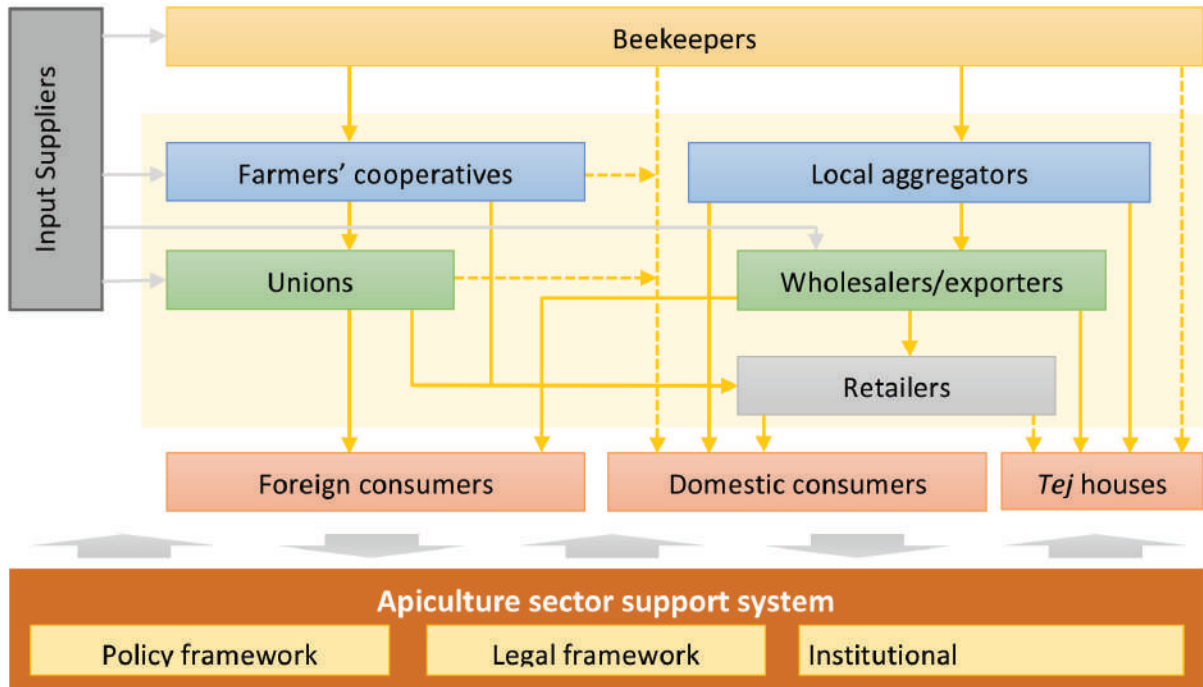
The major challenges of exporting are: inability to meet the quality and sanitary requirements of the importing industrialized countries; rising domestic price relative to export price thereby impacting export competitiveness and the volume of export and hence earnings; market linkage; lack of sustainable supply; lack of entrepreneurship by traders along the value chain; and halting of exports these days due to COVID-19 pandemic.

3.7 Analysis of the Value Chain

i. Value Chain Map

The honey value chain map primarily consists of four major categories of actors: input suppliers, producers, middlemen/processors and consumers. In the following diagram, the flow of inputs is represented in grey lines while the flow of honey and honey products in orange lines. Product flow in the honey market system primarily follows two main channels in order to reach end consumers from the primary producer either in the domestic or foreign markets. The first one is the conventional way that goes from producers to consumers through local aggregators, wholesalers/processors and retailers. The other (contemporary) way is the flow of honey products from primary producers to final consumers through farmers' cooperatives and unions. Generally, the main actors engaged in the honey value chain include input suppliers, beekeepers, cooperatives, unions, processors, local aggregators (middlemen), retailers, consumers (domestic and foreign) and tej houses (locally brewed honey wine). Sometimes, there is no strict division of functions among different value chain actors (see figure 11).

Figure 11: Honey value chain map (own sketch)



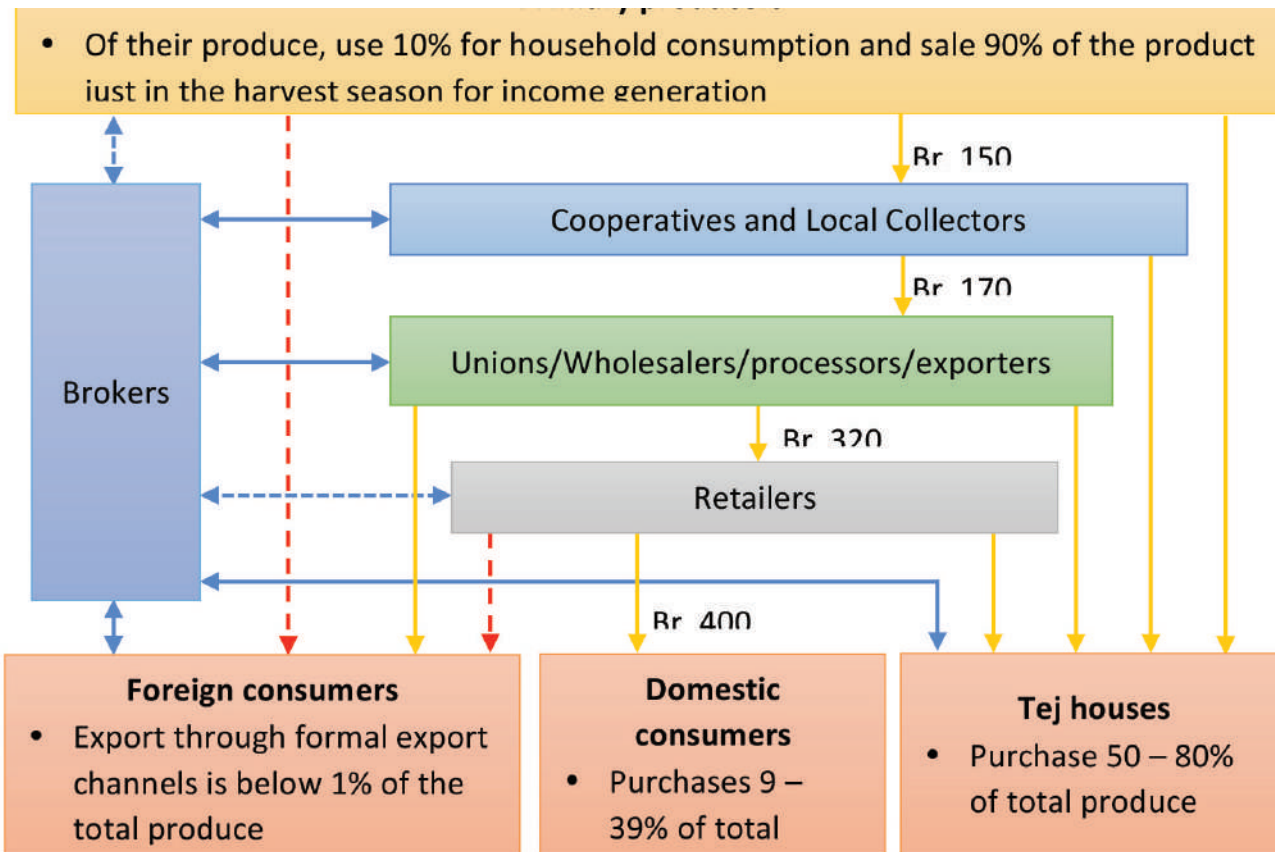
In certain circumstances, an individual actor rather performs multiple functions in value chain. For example, during field visits to Wondogenet woreda of Sidama region, there were household beekeepers that produce, process, pack and sell the processed honey at farm gate to end consumers. There are also large-scale honey processors engaged in beekeeping activities.

ii. Market Flow Map

The domestic honey market starts at the smallholder beekeeper, who mainly sells crude honey to collectors in the nearest town/village markets (figure 12). According to Taye and Marco, (2014) , for example, beekeepers sell their honey mainly to local honey traders (33%), beekeepers association (27.8%), local honey consumers (22%), and to tourists (17.2%). The price of honey is governed by different factors such as distance from market (28%), quality of honey (25%), consumers 'preference (20%), color of honey (15%), and test of honey (12%).

Although some quantity of honey is kept for different purposes by beekeepers, the largest proportion of their honey are sold during harvest period at low price mainly to meet smallholder beekeepers' cash demand (Haftu and Gezu, 2014). In Addis Ababa and the major regional cities, one can find sufficient quantities of honey year-round with stable prices in the main supermarkets and verandas for both processed and crude honey. This is because processors that supply supermarkets have enough capital to buy large quantity of honey during harvest period and from different producing zones and stockpile honey

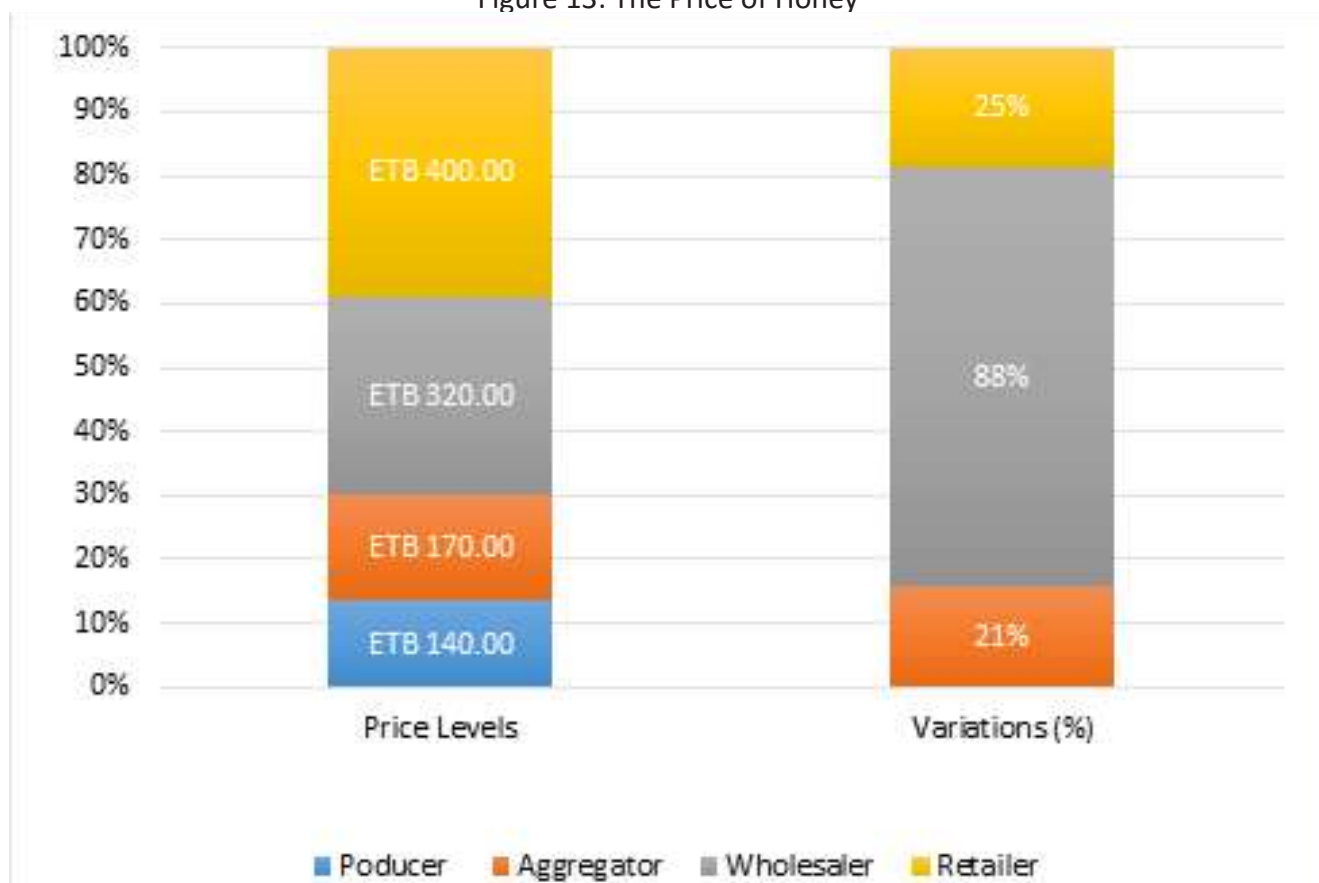
Figure 12: Honey Market flow map (own sketch)



Honey prices vary from region to region, season to season and types. In the absence of time series data on prices of honey, attempt is made to give a picture of the price of honey by collecting honey prices from Addis Ababa market. According to field visit, the most expensive retail price in May, 2021 is that of Eastern Tigray’s white honey which is priced up to ETB 800/kg. While the lower retail prices ranges from ETB 250–600/kg) depending on the areas of origin and the honey ‘s characteristics. The retail prices for yellow honey were in the range of ETB 400– 600.00/kg, while the least expensive red honey ranged ETB 250-400/kg.

During field visit at Wondogenet, beekeepers were selling crude honey at ETB 140 to local honey collectors and tej houses. A local honey collector/aggregator at Besh town of Wondogent district sold the same type of crude honey to wholesalers at Birr 170/kg. In Addis Ababa, wholesalers sold average quality processed honey to retailing supermarkets by up to ETB 320/kg. This would help to see the price mark ups at each value along the value chain system (figure 13).

Figure 13: The Price of Honey



As depicted in the figure 13 above, aggregators’ price increase from farm-gate prices by 21% and that of wholesalers’/processors price increase by 88% from aggregators’ price. Retail prices on the other hand increase by 25% from that of wholesalers’/processors’ price. The relative highest increase in wholesalers’ price is generally associated with transportation, processing, packaging and marketing costs. However, these price figures cannot be used for making further inferences as it doesn’t possess the necessary statistical attributes in that it does not result from sufficiently drawn representative samples across the country.

iii. Operational Actors and their Functions

Hereunder detailed discussions on the operational actors and functions of value chain are presented in the following paragraphs.

a) Input Suppliers

Input suppliers are those organizations and or individual entrepreneurs engaged in the construction/ production and supply of beekeeping materials and inputs to beekeepers as well as processors including farmers’ cooperatives and unions. In most semi-urban and rural areas, individual producers and microenterprises mainly produce and supply basic beekeeping inputs such as traditional, transitional and modern beehives to the local beekeepers. In urban areas (zonal and regional towns and the capital city) however, there are private businesses, which are engaged in production, importing and distribution (retailing) of modern inputs and machinery to beekeepers and processors.

Most of the beekeepers purchase traditional and also improved beehives from local manufacturers. However, the locally produced improved beehives, especially the modern framed hive, is not accessible and of good quality. Although rare, there are cases where government and NGOs provide beekeeping inputs (mostly improved hives) to farmers.

Prices of beehives significantly vary by place, time and other factors. As reported by beekeepers at Wondogenet, the prices for traditional beehive, Kenyan Top Bar, modern frame hive, honey extractor and casting mold (comb printer) are Birr 250, Birr 1,500, Birr 2,500, Birr 11,000 and Birr 9,500, respectively. For framed hives, beekeepers might also require additional wax and prepared comb frames to replace damaged and/ or old frames. In order to use modern frame hives, beekeepers need to have honey extractor and casting mold (wax printer) or at least be able to get in renting/borrowing.

b) Primary producers/Beekeepers

Beekeeping is a useful off-farm income generating activity and has been exercised by many rural farming communities. Most of the country's honey product comes from smallholder farmers with colonies in traditional beehives, which are characterized by very low productivity. Besides the smallholder farmers, there are few private which are engaged in beekeeping as well as honey processing and marketing businesses.

Rural beekeepers use forest trees as well as their backyards for traditional beehives. But they use only backyards and fenced yards to install improved and modern beehives. Traditional beehives are important tools to trap a swarming bee colony as they are conveniently movable and easy to put on tree branches which are suitable to trap swarming colonies. Traditional beehives are also fitting to transport trapped bee colonies to their permanent hives. Regular check-ups and inspections are part of the daily beehive management activities. Cleaning the environment is also required periodically. However, most of the beekeepers are found negligent about their beehives and visit them only to harvest honey. Productivity is volatile and highly subjected to flora availability, weather condition, season and colony performance.

Beekeepers harvest honey once or twice, while in some cases even three times in a year largely depending on the type of beehives used and availability of bee forage. () Few beekeepers themselves play multi-roles in the chain, including input production (making of hives), production, primary processing as well as bottling and marketing. Major harvesting seasons are October and June.

Generally, access to improved beekeeping inputs (improved hives, comb frames, and other equipment) is very low for smallholder beekeepers in rural areas, and if available, the quality of products is highly compromised. According to Marketing Expert's view, even if the area has high honey production potential, above 90% of local beekeepers relied on traditional beekeeping practices applying only backward tools and production methods. Availability of modern inputs, especially transitional and modern beehives as well as training and extension services is very limited. The expert further explained that even if there are few enterprises in their locality which are engaged in production of transitional and framed beehives, their capacity to meet the quantity and quality expectations is very low. Moreover, beekeepers generally have the feeling that the business is not rewarding () and they do not have the interest and or financial capacity to invest on modernization of their beekeeping practices.

c) Cooperatives and Unions

Farmers' cooperatives are currently at the center of governmental and non-governmental actors' development agenda due to their role in promoting rural development in general and commercial agricultural practices in particular.

Cooperatives can follow production-oriented model, marketing-oriented model or mixed model on the basis of their functions and services. Production-oriented cooperatives focus on collaborative beekeeping and honey production. This type of cooperatives owns an apiary where they keep beehives and members perform daily activities by sharing time to manage the beehives. They also form a central committee which is responsible for the overall administrative activities of the cooperative.

The second type of cooperatives is the marketing-oriented cooperatives, in which member beekeepers work on their own apiary sites, harvest the honey and bring it to the cooperative's collection center to be processed and/or sold in larger quantities. The cooperative will buy the honey from its members at the agreed upon price and pay the price at the time of sale or latter depending on the financial position of the cooperative.

In Ethiopia, basic cooperatives follow a mix of production and marketing models. They provide beekeeping inputs such as finance and modern technologies to members to increase production and create better market outlets for their produce. Besides, Union collect honey from member cooperatives to process, pack and supply honey products to the wider local and foreign markets.

In SNNP region, there are 179 functional farmers' cooperatives (excluding Sidama) with more than 5500 members. There is Kefa Shaka Honey Processors Union, which is dedicated to collect and process honey products to supply both in domestic and foreign markets. Unions have capacity of building linkages with national and international traders to supply the honey collected to improve their member beekeepers improve market access and increase their income. In SNNP region, for example, from July 2016 to June 2018 honey-processing unions have exported about 574 ton of processed honey and earned above 1.8 million USD in three years' period. However, in 2019 and 2020, the unions didn't export any mainly due to their inability to fulfil the required quality standards.

Despite the high potential to boost production and marketing capacity of their members, cooperatives and unions suffer from a number of problems that limit their performances. As explained by the Marketing officer of Zembaba Union, their Union faces problems related to business management, technology constraints, lack of finance and skilled man power. Cooperatives are generally recognized for supplying pure natural honey without adulteration to processors and consumers. However, they also face strong competition from local aggregators, which offer better prices and give advance payments for beekeepers before the honey is harvested. The honey collected by these local aggregators is subjected to adulteration and also illegal cross-border honey trade. Above all, cooperatives usually managed and operated by volunteers (for example school teachers in case of Sheka zone), which are not paid for their services. As a result, activities are not performed timely and their performance is highly compromised.

d) Wholesalers/Processors/Exporters

The wholesalers are urban based traders who collect honey from producers and or local aggregators in bulk and sell it to either retailers or domestic consumers or export markets. Wholesalers have established long-term relations with producers and/or local aggregators by which they secure adequate supply of honey. The wholesalers either sell honey directly to the consumers after packaging or they supply honey to retail shops and supermarkets after packaging. They also have storage facility for packed honey. There are several private organizations engaged in wholesaling, processing of honey products and exporting.

The honey price in the domestic market is higher than the international price thereby making honey export less attractive and profitable. Instead targeting the local markets which are more attractive. Illegal cross border honey trade, the recurrent drought which affects supply and the laboratory service costs usually demand foreign currency and continuously increase in price.

e) Retailers

Retailers are actors who buy the products from wholesalers and sell them to the final consumers and include supermarkets and retailing stores. Supermarkets generally receive fully processed and packed honey products, whereas honey retailing stores purchase processed honey in large quantities and pack them in smaller amounts mostly in plastic bottles and jars of size, ranging from 500 grams to 5 kilograms and sell to final consumers.

In the urban market it is common to find adulterated honey usually with sugar. The market value of honey in the urban area is much higher than rural area. The honey market supply chain is not organized to cope with the honey demand in the urban market. This gives opportunity for illegal honey merchants to mix other substances with honey and sell it on the market as normal honey. This impacts the honey consumers trust negatively and decreases the interest to buy honey from the market.

f) Tej Houses

Tej houses are market actors which buy the majority of honey produced in the country. The type of honey that they buy is mostly crude inferior quality. Honey consumption estimates by Tej houses vary substantially from 50 to 80% of total production. However, these estimates may be incomplete due to claims of informal export of honey to Sudan, Somalia and Djibouti.

g) Support and Facilitation Institutions

The consulting team has consulted some of the support institutions and development partners that engage in providing technical and financial support to the main actors in the apiculture and honey value chain. Among others, Agricultural Transformation Agency (ATA) and GIS are the major ones. Of which, ATA planned to reach about 3000 Beekeepers in the South Western part of Ethiopia in Shekaa -Ilubabor and trained 2800 of which 30% of them were women. In ATA programs implementation, it has trained 2800 Bees keepers in 'Contract Farming' arrangements whereby ATA links the farmers with pertinent business and consumers in different regions which reduce the number of middlemen effects and also enhanced quality of honey and system of traceability. Traceability is one of the key parameters in honey export standardization and certification requirements. The Ethiopian Agribusiness Acceleration Platform (EAAP)'s intervention in Honey Value Chain can be classified under the following three tracks: The Incubation track: Aimed at professionalizing select early stage agro-processors to help them scale their operations by offering business development services.;

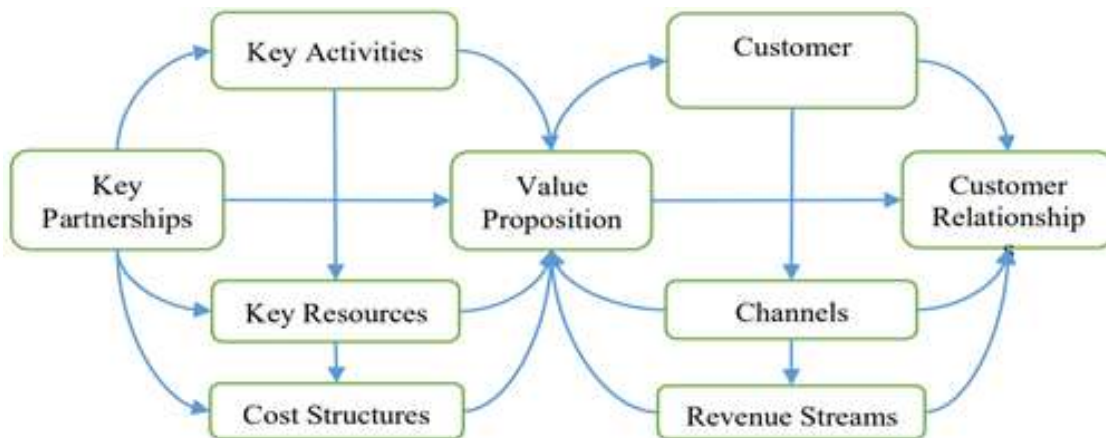
The Acceleration Track: Provides customized business development support to mature enterprises who have been exporting for several years,

Ecosystem Track focuses on supporting ancillary services in order to provide a robust ecosystem for EAAP MSMEs. This includes support services to inputs supplies and quality testing laboratories.

3.8 Business Model Analysis

According to Amit & Zott (2014), defined business model as a system that is designed and enabled by a local firm in order to meet perceived market needs. Similarly, Osterwalder and Pigneur (2010) define a business model as a description of the rationale of how an organization creates, delivers, and captures value. These authors argue that a business model should be built primarily to perform two important functions: revenue/value creation (through a defined series of activities, from raw materials acquisition to consumer satisfaction) and value capture from a portion of those activities. Both are important in to enter the market system and stay profitable and sustainable. The following business model demonstrates how an ecosystem creates, delivers, and captures value (Figure 14).

Figure 14: Business Model Analysis,



Source: Chesbrough, (2010), and Osterwalder & Pigneur, (2010)

There are different types of honey business models developed, proposed and tested in different times and places (for example, the Tripartite Business Model by Honey Care Africa etc.). In Ethiopia, a business model for commercial beekeeping is not yet in place.

Although every business model has unique features, there are general models that can be used as guidelines across all businesses. A modified BMC analysis is presented in the following paragraphs.

a) Key Partners

The main partners for the beekeeping are suppliers, representing input suppliers (such as finance, beekeeping materials, equipment and accessories); other apiaries supplying biological inputs such as queens and bee colonies and also facilitate exchange of knowledge and information. Purchasers and processors, which play the role of intermediaries, are partners that ensure the collection and processing of honey and facilitate the export of honey products to foreign markets. Associative forms (cooperatives, unions and beekeepers' associations) are a way for beekeepers to adhere to an environment related to their interests. Such structures provide its members access to a number of benefits such input supply, marketing of bee products as well as providing technical and legal advices. The government and non-governmental actors are also relevant partners.

b) Key Resources

Bees need diverse and abundant floral resources to stay healthy and productive making food resources key for effective beekeeping business. Beekeeping also needs physical resources such as production equipment and infrastructure (transport, storage, etc.). The hive which serves as shelter for bees and storage of food reserves is the most important beekeeping equipment. Other resources include protective equipment for handling bee families, honey extractor and in some cases processing materials (in Ethiopian case, honey is processed mainly by honey processors which are mostly private business enterprises). Financial resources are essential for the development of the apiary.

c) Key Activities

The beekeeper's operational activities include: inspecting colonies, feeding them, monitoring the growth and decline of the bee population, controlling the process of colony reproduction, harvesting bee products, preparing for winter and migrating towards improved nectar resources. The beekeeper must also closely monitor changes in the environment and anticipate potential effects on the colonies. The management of bee colonies represents a considerable part of the beekeeper's time. During harvest seasons, the beekeepers need to carefully collect honey from their hives and conduct certain post-harvest activities including repairing old/damaged comb frames. Packaging, storing and supplying of honey to local markets are also activities being carried out by beekeepers.

d) Value Proposition

Bee products are mainly used as healthy nutrition alternatives. The by-product of honey is also used in cosmetics and chemical industries. In developed beekeeping markets, beekeepers serve different customer segments that look for different products ranging from various types of honey, to pollen and royal jelly or other value-added products. In the case of Ethiopian beekeepers, value addition prospects are limited.

e) Channels

Supplying honey to local collectors and farmers' cooperatives are the widely used channels for supplying honey by beekeepers. Farm gate selling is therefore one of the main ways through which beekeepers sell their products. Local consumers and tourists, whenever possible, prefer to purchase directly from beekeepers to get unadulterated or unblended honey. Other channels including online markets and organized beekeeping fairs are not options for Ethiopian smallholder beekeepers. Modern channels are somehow used by private processing and exporting enterprises.

f) Customer Segments

Bee products are used by people of all ages and location, both in urban and rural areas. The urban honey market is segmented into individual households and Tej houses, while at the farm gate the segmentation of customers involves consumers (locals or tourists) and local aggregators acting as intermediary agents. Intermediaries are the link between bee products, in general, and processors and sellers in both domestic and international markets.

g) Customer Relationships

In the beekeeping value chain, the customer relationship takes more of social relation without applying legal and binding arrangements. Customer relationship at local level is established between beekeepers and local aggregators through offering higher prices and advance payments. The other relationships of beekeepers are institutionalized through cooperatives and unions, that provide various production and marketing services to their members. However, enforcement of mandates between beekeepers and cooperatives as well as cooperatives and unions is highly compromised due to organizational capacity limitations.

h) Cost Structure

According to the analysis of the cost structure of a bee farm the costlier resources are beehives, extractor and wax printer. Application of other beekeeping equipment and utensils is very limited among smallholder beekeepers. Beekeeping is mainly carried out by own land and family labor that significantly reduce fixed asset and operational costs of beekeeping. Costs including taxes for utilizing floral resources, taxes and fees paid to the government, fees to utilities as well as sales and marketing costs are not applicable in case of Ethiopian smallholder beekeepers.

i) Revenue Streams

The primary way through which beekeepers earn income is by selling honey and other bee products. Beeswax is obtained along with honey and is another important source of income for beekeepers and intermediaries who are engaged in honey processing activities. Beeswax enjoys constant demand as it is used mainly to make traditional candle called Tuwaf which is used in religious ceremonies. The other beekeeping products such as pollen, bee venom, royal jelly and propolis are not known by rural beekeepers.

j) Technology and inputs adoption behavior

The uptake of modern beekeeping technologies by beekeepers is very low. As reported in previous studies, penetration rate of modern beehives is scanty, let alone other modern beekeeping tools and equipment. Till to-date over 95% of the total honey produced in the country comes from traditional beehives, which use backward system of production and harvesting.

The major problems facing beekeepers in adopting modern technologies and inputs in their beekeeping practices are access to input markets and financial resources. If input markets are available. Most available beekeeping input stores are found at zonal and regional capitals which are hardly accessible for rural beekeepers. Moreover, prices of available inputs are beyond what smallholder beekeepers can afford. Quality of inputs, especially modern beehives, is also another critical issue retarding dissemination of such hives among beekeeping community.

Research institutes, TVET colleges as well as microenterprises should have key roles in designing, adapting and producing improved and modern beekeeping inputs and make them accessible for rural beekeepers. Manuals need also to be prepared and used by input producers so that they could maintain quality standards. The information regarding modern technologies and inputs needs also to be available at grassroots levels and supported with awareness and capacity building trainings. Woreda and kebele level government structures are options to reach the community engaged in beekeeping.

Not only primary producers, but wholesalers/processors also use inputs and machineries to effectively run their apiculture business. Especially those processors operating in rural areas (such as cooperatives) face storage and transportation problems.

3.9 Opportunities, Challenges, and Suggested Interventions

3.9.1 Opportunities

Overall, the Ethiopian Government has identified the Apiculture and Honey producing sector as offering growth potential, including targeting the export sector as a foreign exchange earning source, one generating additional off-farm income for small-scale farmers and leading to poverty alleviation in rural areas. The sector is also seen as offering potential for job creation in rural and urban areas and has encouraged, apart from beekeeping itself, the production of beekeeping equipment and beehives amongst jobless urban and landless youth (GBN, 2020).

Apiculture is a promising off-farm enterprise, which directly and indirectly contributes to smallholder's income in particular and nation's economy in general. It has significant role in generating and diversifying the income of subsistence farmers. It is an opportunity for millions can build their livelihood, private investors run successful businesses and also the country earns considerable gains from the sector. Even though availability of modern technologies and inputs is very limited, but there is still enormous gap in utilizing the available ones by smallholder beekeepers.

Given the untapped potential for production and increasing demand for the product, the number of private sectors, which would engage in the production, processing and exporting of honey can easily be doubled over short and medium term through mobilizing, providing training and providing seeds money to the youth.

The current GREEN Legacy Initiative in the country will be an opportunity to increase honey production. This requires adequate preparedness, coordination and mobilization.

The existence of niche market to Ethiopian organic and fair trade certified honey is another driving force which encourages the private sector and smallholder cooperatives to boost their production and export

Another key realizable opportunity is that Ethiopian producers and packers have realizable opportunity to break further away from the commodity business /selling unprocessed honey to moving to producing and exporting honey products that are not tied to commodity prices.

Government is committed to expand industrial parks including agro-processing ones, and also promoting farmers' cooperatives and unions so as to engage them in processing/value addition activities. As the result, smallholder farmers are accessing better and wider markets to sell their products in better prices. This, in turn, will help commercialization process of honey production. Apiculture products could be processed into several important marketable products including purified honey, beeswax, propolis, pollen, bee venom, and royal jelly (ARSD, 2000 and Gezahegn, 2001).

The processed honey in Ethiopia has shown increasing demand. For example, the increasing in domestic and export markets volume of honey of the twelve enterprises supported by ATA under The Ethiopian

Agribusiness Accelerators Platform (EAAP) has demonstrated the processing potential demand in the country (GBN, 2020) which should be exploited with further investment to expand the outreach to other private actors who need financial support from the EAAP in other regional states

Domestic demand in Ethiopia is burgeoning due to increasing population (estimated over 110 million), expanding urbanization, rising purchasing power due to over a decade of economic growth, changing life style, (Sisay, 2018; Yeabsira, 2014). In addition, the Influx of tourism and existence of large number of foreigners due to the country's African capital etc.

In nutshell, the opportunities can be summarized as follows: -

- In addition to honey and bee wax, there are a number of other bee products such as propolis, royal jelly, pollen and bees' venom, which have got a very huge demand for their several health and nutritional benefits and other importance and can be sold in the lucrative market in the different parts of the world.
- As organic honey producer, Ethiopia can boost its market into organic and Fairtrade honey market which fetches premium price;
- The global honey market is expanding. There huge potential market in EU for Ethiopian honey since the EU depends on import for about 40 % of its demand;
- Ethiopia has various market access opportunities in EU through Everything but arms (EBA) initiative, America through AGOA and other advanced and emerging economies. Now as member of AfCFTA (African Continental Free Trade area), Ethiopia has got market access opportunities in the continent, which is a net importer of natural honey;
- Ethiopia has been promoting export sector through regularly improving the investment and business climate and revising investment act of the country; i.e., exporting firms have been enjoying more privilege than non-exporting firms;

3.9.2 Opportunity in Apiculture Sector

Desk reviews, key informant interviews and FGD analysis shows that the country has untapped potential in apiculture sector and hence business opportunities along the whole value chains in producing, collecting, processing, packaging and exporting honey and honey products. Detailed opportunities are discussed in the following paragraphs.

a) Production Opportunities

Given untapped apiculture production potential in terms of forest coverage, abundant water resources, etc., there are immense opportunities for both smallholder farmers (existing and new) and commercial farmers who are willing to engage in the business of honey production. Statistics show that the current production is only 26 percent of the sector's honey production potential. Moreover, there are various incentives and supports by government for those actors willing to engage in the apiculture sector as can be seen from government policy documents.

SNV and others have been supporting to transform beekeepers and their followers from subsistent to semi-commercial beekeeping and, in so doing, make Ethiopia an internationally recognized producer

of high-quality honey and other bee products. The support emphasized both business and institutional development in the value chain.

b) Processing Opportunities

The demand for processed honey has been increasing especially by local honey consumers for food purpose and export market. These days the demand for processed and packed honey has increased in the local market as consumers' preference changed with changing economic circumstance and expansion of urbanization. Hence, private sector has been entering into the subsector since recently. Available information shows that currently there are more than ten private commercial honey processors operating in the different parts of the country. Some of processors also engaged in honey production so as to ensure consistency of the quality of raw honey and be able produce sufficient volume that their processing machine requires. Besides, various investment incentives have been given in order to attract investors into processing or value adding activities.

c) Export Opportunities

Ethiopia's honey has got especial place among European countries which are highly quality sensitive. The problem is Ethiopia has been unable to export large volume of honey. There exists niche market for organic and fair trade certified honey in European market. The demand for organic honey in European market is growing overtime and fetches premium price and on the other hand, Ethiopia is proved to have great potential in this regard. Ethiopia has market access opportunities in EU market through everything but arms (EBA) initiative, American market opportunity through AGOA and other advanced and emerging economies has provided preferential treatment for Ethiopian exports. For instance, EU member countries meet about 40 percent of their total honey demand from import. Now as member of AfCFTA (African Continental Free Trade area), the African market access opportunities a net importer of natural honey is another opportunity for exporters. There is an increasing demand for honey globally, regionally and nationally due to preference of consumer for honey instead of sugar

In addition to honey and bee wax, there are a number of other bee products such as propolis, royal jelly, pollen and bees' venom, which have a very huge demand overseas for their health and nutritional benefits and that can be sold in the lucrative market that exists in most parts of the world.

Besides, Ethiopia has been promoting export sector through regular improvement its investment and business climate as the result-exporting firms have started enjoying better privilege to non-exporting firms.

3.9.3 Challenges

a) Challenges of Supply

Most of the country's honey passes through local market channels, which are mostly characterized, by asymmetric properties and lengthy chain of actors. The supply of tools necessary to manage modern beehives is not readily available. Some beekeepers possess modern beehives (just boxes), but they lack the tools required for the proper management of beehives (such as a smoker, queen excluder, or honey extractor). Low productivity due to low adoption rate of modern beekeeping technologies and inputs. Intensification of chemical application in crop production in agricultural practices and deforestation are other challenges affecting honey productivity and supply.

Moving to transitional and modern beehives requires an initial investment capital that most beekeepers are unable to mobilize and use modern bee technologies to improve honey yield. deforestation from time to time for timber making, construction, fire wood and expansion of agricultural lands are causing shortage of bee forage especially during the dry season, in turn, reducing production.

b) Challenges to enter into the export market

Large demands beyond local exporters' supply capacity: Exporter not able to collect adequate organic honey from local sources to fulfill the requested order for exports.

Poor Market Linkages both domestic and oversea: Some honey processing firms who produce processed honey for exports don't have adequately developed market linkages with exporters. There is a big gap in Business development supports (BDSs) and creating Market linkages.

Poor logistics and shortages of packaging materials for exportable goods: There is limitation to access packaging material with good quality and reasonable prices.

High domestic demand and higher domestic prices than world prices: The honey price in the domestic market is higher than the international price which makes honey export less attractive business in Ethiopia

c) Challenges of processing business

Honey processing business activities require health and sanitation competency certificates and adequate space for processing and storing products. processing business requires substantial start-up capital. The other problem facing honey processors is adulteration of honey at each value chain; thereby making traceability and accountability hardly possible; high participation of middlemen low quality honey; lack of support from government and other private sectors and umbrella organization

Respondent from Harro Mare Agro-Processor in Yirgalem Integrated Agro-Processing Industrial Park stated that

"...There are large demands for processed honey from Ethiopia beyond local exporters can supply: For example, Harro Mare Producing, Processing and Exporter Company could not able to collect adequate full organic honey from all the farmers and our own farm to fulfill the requested order for exports. Apparently, there is shortage of fully organic honey variety which entails the need to support the farmers in the surrounding areas to use the full organic honey production..."

3.9.4 Suggested Interventions (Table 7)

Table 7: Challenges, Opportunities and Areas of Intervention

Business Elements	Challenges	Opportunities	Areas of intervention
Support environment: Policy, legal and institutional environment	<ul style="list-style-type: none"> no specific Ethiopian legislation covering export of honey and other bee products (Hive Products Marketing Proclamation is still in the process) Poor advocacy capacity of beekeeping associations to influence policy, legal and institutional environment Poor communication, collaboration and partnership among active supportive institutions in the sector 	<ul style="list-style-type: none"> Generally, there is favorable policy environment and strong government commitment to the development of the sector Supportive NGO sector providing funds and technical support to different actors of the value chain 	<ul style="list-style-type: none"> Strengthen beekeeping associations to bring tangible changes (develop strategic plan, members and stakeholders' engagement guideline, strengthen organizational systems and resources) Strengthen collaboration and coordination platforms (regularly arrange forums and consultative meetings with stakeholders) Establish national/regional apiculture information and resource centre
Suppliers: Importers, Manufacturers, Workshops, MSE, TVETs, Associative forms, GOs, NGOs,	<ul style="list-style-type: none"> Lack of demand for improved inputs: underdeveloped input market mainly due to subsistence beekeeping system by smallholder. Small holder beekeepers are also hard-to-reach by input suppliers as such entities are mostly found in urban centers (in regional and zonal towns) Lack of raw materials, technology (such as machineries) and expertise to produce quality tools and proper technology Lack of investment capital, especially for local workshops which are engaged in producing improved and modern beekeeping and honey processing materials and equipment Quality problem with imported as well as locally produced inputs 	<ul style="list-style-type: none"> There is established knowledge centers (Research Centers, TVETs, Farmers' Training Centers, and workshops) to promote innovation and production of modern technologies There is extended institutional arrangement that reaches every farm household (cooperatives, kebele community structures, agriculture extension workers) Availability of rural MFIs accessible for rural households Evolving and developing community awareness Availability of local versions of improved technologies (e.g., Ethio ribrab beehive) 	<ul style="list-style-type: none"> Support innovation and research activities (research grants, funds, trainings, etc.) Improve the performance of woreda and kebele extension warders through continued training supports Establish entity which ensure inputs quality standards (local government offices and associative forms can play quality assurance roles) Create access to finance as well as infrastructure for input manufacturing firms Promote local technologies
Producers: Smallholder beekeepers, Cooperatives, Private companies	<ul style="list-style-type: none"> Subsistence beekeeping practice and honey production system and low motivation resulted from the mindset that apiculture cannot be a sole source of income Low modern inputs adoption behavior due to lack of awareness and access by smallholder beekeepers 	<ul style="list-style-type: none"> Diverse ecology and flora, green economy and afforestation initiatives The sector being low land, labor and technology intensive: smallholders can simply use their own land and labor to enter the sector 	<ul style="list-style-type: none"> Integrate forestry initiatives with beekeeping and other non-timber products Strengthen associative forms: and provide need-based support Create access to finances to stimulate private investment

Business Elements		Opportunities	Areas of intervention
	<ul style="list-style-type: none"> • Low productivity resulted from subsistence beekeeping practices • Inadequacy of training and extension services • Crop intensification and use of agrochemicals, leading to environmental degradation • Lack of business development services and capacity limitations by cooperatives • Low participation of private sector in production and distribution of beekeeping products • Lack of investment finance for private investors 	<ul style="list-style-type: none"> • Accumulated wealth of important indigenous knowledge • Large number of rural labor (including women and elders) that can be utilized by providing basic beekeeping skill trainings 	<ul style="list-style-type: none"> • Strengthen extension service delivery structures (FTCs, associative forms, extension workers)
<p>Processors/exporters:</p> <p>Private companies, Unions,</p>	<ul style="list-style-type: none"> • Very low and poor quality supply of honey (relative to its demand), inability to meet quantity and quality requirements of the export market • Only honey and bee-wax are supplied • Adulteration and poor quality of honey • Lack of value addition: knowhow and technology to produce other high value beekeeping products • Disproportionately high demand for poor-quality honey by Tej houses deterring honey producers to engage in value additions • High quality standards requirement by foreign markets and volatile export prices • Absence of infrastructure (laboratory, logistics, etc.) 	<ul style="list-style-type: none"> • Growing domestic and foreign markets • Opening of new foreign markets including the European Union (but so far honey is exported to only few EU countries) • High willingness to pay by consumers for pure and natural honey • Organic products with high acceptance in local and foreign markets • Wide room to produce specialty and mono-flora honey varieties • Untapped demand for high value beekeeping products such as pollen, bee venom, royal jelly and propolis 	<ul style="list-style-type: none"> • Institutionalize, formalize and legalize trading partnerships between processors/exporters and unions and or cooperatives • Make adherence to the three bees and honey related standards mandatory • Ensure legal accountability for wrong doers • Conduct organizational capacity and sustainability assessment for the existing businesses and provide need-based support • Create access to investment finance • Support promotion of Ethiopian honey in the international market and assist in market intelligence • Capacitate existing laboratories/test centers and facilitate accreditation
<p>Market system:</p> <p>Domestic and foreign markets</p>	<ul style="list-style-type: none"> • Illegal cross-border trade • Absence of market information centers, extended market chain resulted in low producer prices but high retailer prices • producer prices determined by local collectors • Absence of grading and scientific specification of honey varieties 	<ul style="list-style-type: none"> • Expanding Infrastructural developments (such as roads and telecoms) • Opening of foreign markets for Ethiopian Honey (such as EU) 	<ul style="list-style-type: none"> • Control illegal cross border trade • Strengthen licensing and inspection activities to legalize and formalize honey marketing activities • Facilitate contractual agreements among actors in the value chain, • provide information • Establish grading and specification standards and make them mandatory

3.10 Conclusions and Recommendations

Overall, the apiculture sector of the country has huge unrealized potentials. realization of the potential and value addition along all the value chain will increase income for producers, processors, traders and all those engaged in the sector along the whole value chain. It could have also generated the much-needed foreign exchange and employment.

Despite increased demand both locally and overseas, there are no sufficient honey supplies indicating existence of opportunities if the country works on quantity and quality.

The main challenges of honey production, processing and export in the country are: inadequacy of production due to low productivity, low technology adoption rate; poor quality and pricing of products, lack of coordination mechanisms and policy and poor human resource development.

Most of the beekeepers do not have access to modern technology/equipment. Even, improved beehives are not easily accessible in their locality, locally produced beehives suffer from serious quality problems; imported materials such as honey extractor and comb molding cast need to be used complimentarily with modern frame hives. As a result, modern inputs adoption and utilization behavior by smallholder is very low leaving the sector highly dependent on traditional practices.

Continuous extension services for smallholder beekeepers and also promotion and expansion of modern beekeeping technologies are required to stimulate commercialization and modernization of beekeeping practices in rural areas. Besides, expansion of crop production and related problems (deforestation, application of chemicals in farming practices, etc.) and intensification of insects and predators attacking bee colonies are also other problems facing beekeepers.

3.10.1 Recommendations

Business linkages along the value chain: A supportive enabling environment is critical for encouraging business linkages between market actors in the value chain. Along with government policies and strategies, private associations such as Ethiopian Beekeepers Association and Honey and Beeswax Exporters Associations should be strengthened to play key roles to facilitate coordination and communication activities between actors. Enabling conditions such as supporting business start-up process, promote business partnerships and also contract enforcement are necessary activities to strengthen inter and intra-actors' linkages in the value chain system.

Strengthening linkages along the value chain: The path for smallholder beekeepers towards commercialization is linking them to formal markets. Formal markets have the power to control and guide prices and quality requirements so that all actors will respond according to the market dynamics. The most viable strategy to create access to formal markets in Ethiopia is through farmers' cooperatives and/or unions which are close not only to the rural beekeepers, but also to the formal market system. These structures have also a proven capacity of promoting cooperation and communication among the value chain actors. Supported with continuous extension services, cooperatives need to be strengthening to enhance their capacity and effectiveness. Other regional and national level structures such as National Beekeepers Association, Honey and Bee wax Exporters Association, National Apicultural Board of Ethiopia also need to be strengthened and play their roles effectively. It would be highly strategic if the cooperatives and unions legally mandated to be formed and established with business model of profit maximization.

Honey Marketing System for strengthening forward linkages with buyers: The whole domestic honey market lacks proper structure and legality. The adherence to quality standards in the honey sub-sector is largely voluntary. It is the lengthy chain of actors that limited access of producers to bigger and better paying markets. So, the beekeepers complain the business as not rewarding and even lacking the market for their product, while the consumers see the ever-increasing price of honey as unfair. In many cases, adulteration of honey has also been a frustrating factor for both the producers and legal buyers and sellers as the traceability and accountability is hardly possible. Standardization of products and also providing and maintaining quality indicators (information on quality composition, branding, grading, certification and enforcement mechanisms etc.) are relevant. Therefore, the relevant government bodies should give due attention to approve the already developed mandatory legal framework for honey.

Addressing the policy gap in Apiculture and Honey subsector: The evidences show that apiculture sector hasn't given the proper attention by policymakers. Ethiopian honey is already a certified commodity to be traded in Europe. However, the sector has not been supported with policy to exploit the potential. Therefore, the Honey sub sector needs specific marketing policy and system to grow.

Coordination and networking of Strategic Partners: Coordination between different actors in the same nodes or different nodes in the chain was strengthened by bringing them together on a common platform to enhance common understanding towards achieving a common goal. To create more efficient honey supply chains, coordination among chain actors and supporting/facilitating organizations including logistics and other service providers is critical. If worked in a cluster investment in infrastructure, access to financial services and information, capacity building and investment in innovation and entrepreneurship become more efficient. All stakeholders should involve in regular discussion forms. These entails that there should be a clear legal framework-policy and clear rules supported by proper system like follow-ups, supportive supervisions, monitoring and evaluation mechanisms at all levels by the responsible bodies.

Quality Standards Certification and Adherence: Standards for the honey sector have been in place in Ethiopia since 2005. However, adherence to these standards is currently voluntary. The consulting team recommends the adherence of the quality standards to be mandatory through the timely approval of the legal framework for the sector. Concerted efforts have to be made by the pertinent government bodies and strategic partners of EHBPEA to make Branded Organic Honey Certification to enter into the honey niche market.

Human Resources and Skills Development: Apparently, there are skills and expertise gaps in the honey production and processing. Moreover, manpower retention and hands on continuous staff skills building is limited. Staff motivation is low due to less pay and benefit package. Though the honey production related work is hazardous and require working in dark but not given the attention it demands. Since the honey export market is highly competitive landscape filled with different kinds of requirements such as: quality, quantity, organic production etc. The requirements are getting more and more exacting with little sign of abetting. Therefore, the government and pertinent bodies need to upgrade the human resource and skills development with increased budget for continued on the job trainings on the ground. There should be due attention on quality through awareness creation, continued trainings to the agricultural extension workers and the other main actors in the value chain. It is necessary to exert utmost efforts to make modern inputs accessible and affordable to improve modern technology adoption behavior of beekeepers .

There is a need for Planned Preparedness for the AfCFTA: The Africa Continental free trade agreement (AfCFTA) can be an opportunity by increasing our productivity and quality. Lack of adequate supply is increasing the domestic price of products in the local market. This might give the opportunity for other African countries within the AfCFTA to fill this void. To compete with in AfCFTA, Ethiopia has to give due attention to enhancing the production and productivity of the sector.

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Chapter Four:

**Value Chain Analysis of Aromatic
Herbal Plants with Special focus on
Usage for the Cosmetics Industry**



Executive Summary

In recent times, green consumerism and the resurgence of the use of “green naturals” have given a fresh impetus to the development of plant-based products, especially in beauty and wellness industries. Botanicals products in cosmetic industries given different names such as herbal extracts, plant extracts, hydrosols, tinctures, distillates and they are derived from plants in different ways. Nowadays, the global market value of the aromatics/herbal industry has increased tremendously, from US\$60 billion in 2000 to US\$105 billion in 2017 with annual growth of 7.6 %. Such data is further projected to show that the global herbal medicine market is projected to grow from USD 230.03 billion in 2021 to USD 430.05 billion in 2028 at a CAGR of 11.32%. Earlier reports per capita cosmetics spending by prosperous nations revealed that the average consumption among the European 27 countries is €128 per year.

Globally, Medicinal Aromatic Plants (MAPs) species are ranged from 35,000-50,000 in number and out of this 4,000- 6,000 species have entered the world market of medicinal plants and about 100 species have been used as a source of modern drugs. According to the definition of WHO, medicinal plant is part of the larger category of plants “herbs” and is a plant organism that contains, in one of its organs, substances that can be used in therapy, or which are precursors of hemi synthesis of pharmaceutical species.

According to FAO, the worldwide production of aromatic plants is estimated to 330 million tons from a total area of 77million ha, in which about 90% of the production comes from wild collection and the rest 10% is from either smallholder or commercial farmers either using natural farming or indoor production systems like in greenhouses, hydroponic and vertical farming practices. One of the main applications for those aromatics/herbal products are cosmetics formulation targeting diversity of final products. Such products of cosmetics and beauty products globally in 2019 traded with a total trade of \$56.7 billion with annual growth rate of 5.21 %.

On the other hand, Ethiopia is endowed with an immense biodiversity in its flora composition. The flora of Ethiopia is estimated to contain close to 6500–7000 species. Of these aromatic plants/herbs are of high importance as they play a valuable and important role in economic, social, cultural and ecological aspects of the community. Cognizant to this real facts, the general objective of this study was to undertake an in depth value chain analysis to generate sufficient information on the main opportunities and bottlenecks through the value chains of aromatic plants/herbs with respect to the cosmetics industry in order to support the home grown economic policy of the nation..

Standard methods and approaches were followed by formulating the research team for qualitative and quantitative data gathering and data analysis process. The major data collection methods and tools included extensive document analysis, in-depth interviews of resource persons, focus group discussions with various relevant organizations’ experts and distribution of questionnaire to purposely selected aromatic plants value chain actors. A mixed data analysis approach has been employed to come up with the study results.

The value chain of Aromatic plants is an array of processes initially starting from growing or wild collection of the plants to consumption and use of aromatic plant products and their derivatives. The core processes which are identified across the value chain includes production of the aromatic plants, collection of the fresh or dried produces, processing or oil extraction, marketing of processed products and consumption. The roles of each actors and service providers along with their respective limitations were also identified and possible intervention which can be implemented at the various stages and, which can improve the chain, have been forwarded.

The global per capita cosmetics spending by prosperous nations reveal that the average among the European 27 countries is €128 per year, and the range is between €24 to €127 per year in the past. The study further revealed that globally about 25 to 35 % of human medicine is known to coming from plant origins and similarly, the cosmetic industry from aromatic herbs is annually growing from 7 to 13 %. Increased annual incomes of individuals, change in lifestyles, robust global population growth and advancement of production, processing and packaging technologies are among major drivers of faster growth in demands of MAPs. Majority of herbal plant species used for cosmetic industry in many nations are growing and cultivated in Ethiopia.

The global annual growth rate of herbal based cosmetics and beauty products is found to be changing from year to year, though reports depicted to the account of 7 to 13%. Nevertheless, compared to other aromatic producing African countries, Ethiopia's current performance is low (1% share). Moreover, the local industries import over 50% of their raw material requirements mainly from India, Brazil, Israel, South Africa and Germany.

The study has tracked the existence working system and hands-on that opened up huge widows of business opportunity for the production and processing of aromatic plants in Ethiopia. Among the main favorable conditions that exist in aromatic plants production and processing includes suitable agro climatic conditions for cultivation of wide range of plants, growing demand for aromatic plants products on international markets, the increase of local awareness of aromatherapy, organic output of aromatic commodity and labor force for aromatic plants production and processing activities.

However, there are some challenges identified in the production, processing and marketing of aromatic plants from the vintage of cosmetics applications. The main limitations are inadequate know-how of the local farmers on the production and post-harvest handling aspect of the aromatic plants, scarce input supply for production, processing and marketing across the value chain, weak linkage among actors, weak support service, and poor market intelligence.

Thus, adopting holistic approach to address the entire value chain development requires the involvement of all stakeholders in the area. This coordination and integration approach help to ensure that all stakeholders support the intervention plan and all those involved in the aromatic plants value chain can take respective responsibility for achieving success. Additionally, this provides a chance to invest and coordinate efforts by private investors, scientific organization, government and numerous NGOs triggering MAPs wiser utilization appeared to be essential to benefit the society, economy and the entire environment.

Hence, capitalizing with the existing system is essential, though the current scenario of production and marketing approaches are very scattered and fragmented. It requires major MAPs development by focusing on the following aspects matching indicated purposes. Intervention areas, at the different level of the aromatic plants value chain, are identified and suggested for implementation. The interventions suggested are expected to be responsibly done by the various actors along the value chain. Improving the aromatic plants production technology packages and supplying improved seed varieties, and creating collateral possibilities, contract farming and strengthening extension services are to be done at the backward linkages of the value chain. Moreover, strengthening the value chain linkage, improve market information systems in the country, particularly through efforts of regional governments at different level and improve market access, improving process capability and capacity utilization, productivity and product quality are some of the intervention areas identified in the forward linkages of the value chain.

4.1 Background

The change theory in this investigation basically underlies that agricultural value-chain framework encompasses the complexity of inputs generation, agricultural production, processing of agricultural commodities (MAPs), distribution and marketing of processed agricultural products. Understanding processes, outcomes, the challenges and opportunities of each link in the chain (i.e., input supply, production, trading, processing, and marketing) and providing adequate information to the value chain stakeholders could catalyze, build up knowledge transfer and attract more investment that is an essential pathway in improving all the value chain of the sector. The value-chain analysis focused on the different stakeholders at each operational level in the aromatic plants/herbs, including raw material providers, processors of intermediate products and finished product manufacturers (WACOMP, 2019). In view of this, Addis Ababa Chamber of Commerce and Sectorial Associations (AACCSA) have commissioned BAMHA Consulting Service PLC to undertake this Value Chain Study on Aromatic Plants/Herbs Production, Processing and Marketing in Ethiopia: the case of Addis Ababa.

4.2 General and specific objectives

The overall objective of the investigation was to undertake an in depth value chain analysis to generate sufficient information on the main opportunities and bottlenecks through the value chains of aromatic plants/herbs with respect to the cosmetics industry.

4.2.1 Specifically, the objectives of the analysis were:

- To assess the global and local economic importance of aromatic plants/herbs for utility in cosmetic industries,
- To collect information about aromatic plants/herbs value chain in general,
- To identify key players and their interactions and linkages within the value chain,
- To undertake analysis of the major opportunities and constraints/challenges that the aromatic plants/herbs and business operators are facing in Ethiopia with particular focus related to cosmetic industry and
- To suggest outlooks and practical recommendations in addressing the identified issues for concerned actors and development partners

4.3 Scope of the work

The scope of the envisaged value chain analysis is to review and map the given value chain, identify weak links for support at the MAPs production and product diversities, processing, technological, institutional, legal, regulatory, and policy, market, and final consumption levels. The scope also includes assessing its economic significance and business opportunities and challenges, and recommends specific areas within the aromatic plant products value chain having potential benefits for producers and actors within the chain and beyond.

4.4 Description of the Methodology

4.4.1 Data Acquisition Approaches

To achieve the objectives stated and perform all the tasks specified, both secondary and primary sources of data have been used. Standard and scientific methods were employed for data gathering and data analysis. The major data collection methods and tools included extensive document analysis (Published and unpublished previous and ongoing study documents), in-depth interviews of resource persons, and selected focus group discussions with various organizations. To this end, the secondary data sources were collected from various internal and external organizations including Central Statistics Agency, Ministry of Agriculture, Ministry of Finance and Economic Development, related academic institutions Ethiopian Agricultural Research Institute, Ethiopian Ministry of Revenue, Ethiopian Custom Commission, Ministry of Trade and Industry, ECX, ITC, TRADE MAP, COMTRADE, International organization Data Base, FAOSTAT, EPOSPEA, and other relevant sources. The statistical data gathered was used for the foundation of the sector diagnosis. Such documents are useful for providing a more in-depth understanding of what is currently happening in the subsector.

4.4.2 Data collection and sampling method

To collect primary data, purposive multi-stage cluster sampling technique was employed. The data collection techniques employed were questionnaire, interview, focus group discussions, key informant interview and observation as explained hereunder. The primary data was collected by using a small sample based study, rather than a large scale survey because of short study time and limited resources. Accordingly, target company managers and experts in the area were interviewed, for in-depth understanding and analysis of the subsector. Similarly, officials and experts from relevant government organizations, associations, researchers who have demonstrated interest in the subsector were interviewed.

In addition to individual interviews, focus group discussions were conducted to explore concepts, generate ideas, determine differences in opinion between stakeholder groups who were engaged in similar activities and triangulate with other data collection methods. The group discussion was made by limited people consisted of 3-4 people due to the current situation. The group discussion was guided with prepared checklist to capture the social interaction and spontaneous processes that inform decision making, which is often lost in structured interviews.

4.4.3 Data management and analysis

After collection of relevant data from various relevant sectors using various data collection instruments, the data were analyzed quantitatively and qualitatively.

Quantitative analysis of the sector was conducted to provide a picture of the current situation in terms of the distribution, value-addition, profitability, productivity, production capacity and marketing. Analyzing these factors highlighted the potential inefficiencies in the subsector.

Qualitative analysis: Information collected through key informant interviews, rapid observation and focus group discussions were qualitatively analyzed. Qualitative content analysis and thematic analysis was used for interpreting the qualitative data collected from FGD, Interview and Key informants. The content analysis was used to evaluate patterns within a piece of content or across multiple pieces of

content or sources of communication. Thematic analysis looks at patterns of meaning in a data set - for example, a set of interviews or focus group transcripts i.e. thematic analysis takes bodies of data and groups them according to similarities.

4.5 Major Discussions and Results

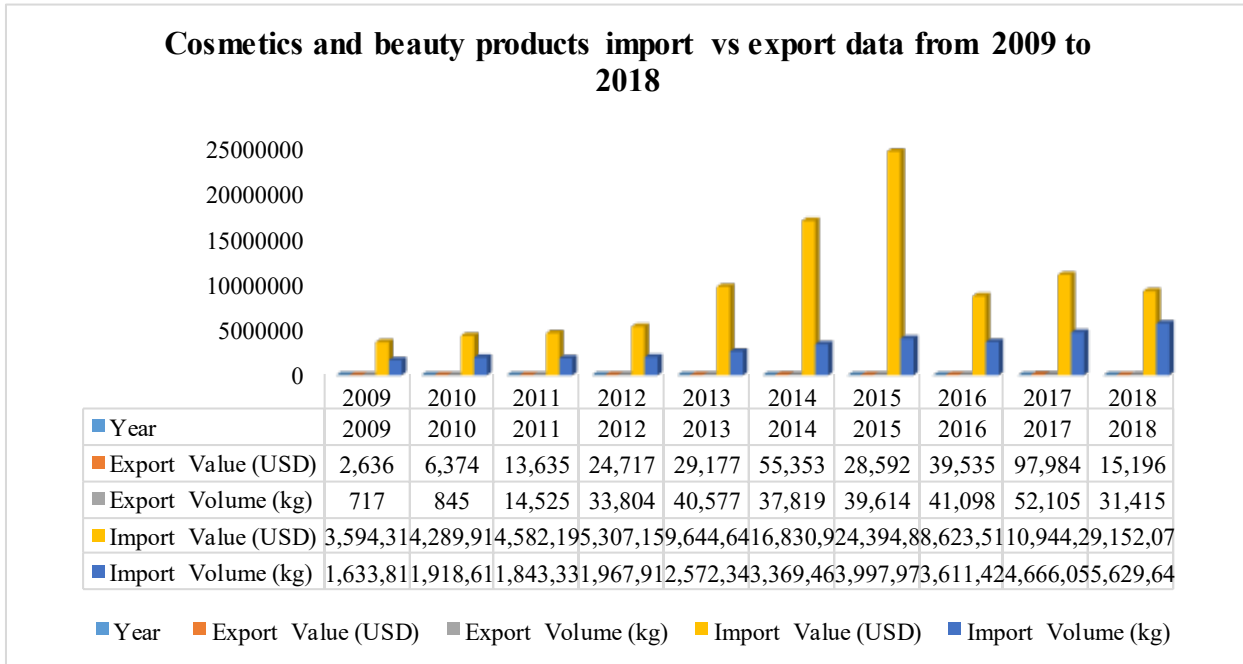
4.5.1 Global Diversity, Production and Processing Situation Analysis

The situation of aromatics plants production and their utility with regard to the scale of production and economic utilization existing data showed that several aromatic herbs are known to produced and process and circulating markets globally. According to FAO, the worldwide production of aromatic plants is estimated to 330 million tons from a total area of 77 million ha. In Europe, there are over 36,000 companies dealing with the cultivation, processing and distribution of aromatic plants with an area exceeding 200,000 ha, most of which is located in France (52,000 ha), Poland (30,000 ha), Spain (27,800 ha), Bulgaria (16,800 ha), Germany (12,240 ha), Croatia (8,500 ha), Czech Republic (7,225 ha), Italy (7,191 ha), Greece (6,800 ha) and Austria (4,136 ha) (EIP-AGRI, 2019).

Botanicals products in cosmetic industries given different names such as herbal extracts, plant extracts, hydrosols, tinctures, distillates and they are derived from plants in different ways. Among the diversity of common fresh aromatics/herbs needed in global market include Basil (*Ocimum basilicum*), Parsley (*Petroselinum crispum*), Coriander or cilantro (*Coriandrum sativum*), Chives (*Allium schoenoprasum*), Thyme (*Thymus vulgaris*), Oregano (*Origanum vulgare*), Rosemary (*Rosmarinus officinalis*), Dill (*Anethum graveolens*), Mint (*Mentha*), Sage (*Salvia officinalis*), Tarragon (*Artemisia dracunculus*), Chervil (*Anthriscus cerefolium*), Marjoram (*Origanum majorana*) and Lemongrass (*Cymbopogon citratus*).

The global market value of the herbal industry has increased tremendously, from US\$60 billion in 2000, to US\$105 billion in 2017. Furthermore, The World Bank projected that the global market will grow at around 7.6% annually (MARDI, 2019). According to a recent study by Fact.MR, the medicinal herbs market is expected to achieve a growth rate of 9.4% throughout the forecast period of 2019–29 in terms of the revenue generated (Fact.MR, 2019). The main 6 aromatics/herbs importing and exporting countries are Netherlands, Germany, France, Belgium, United Kingdom and Spain and the main 6 supply counties include Kenya, Morocco, Thailand, Jordan, Israel and Turkey (CBI, 2020). Figure 1 below shows the general global market trends of cosmetic and beauty products import and export patterns during 2009-2018.

Figure 1: Cosmetics and beauty products import vs. export data



Source: UN-COMTRADE, 2021

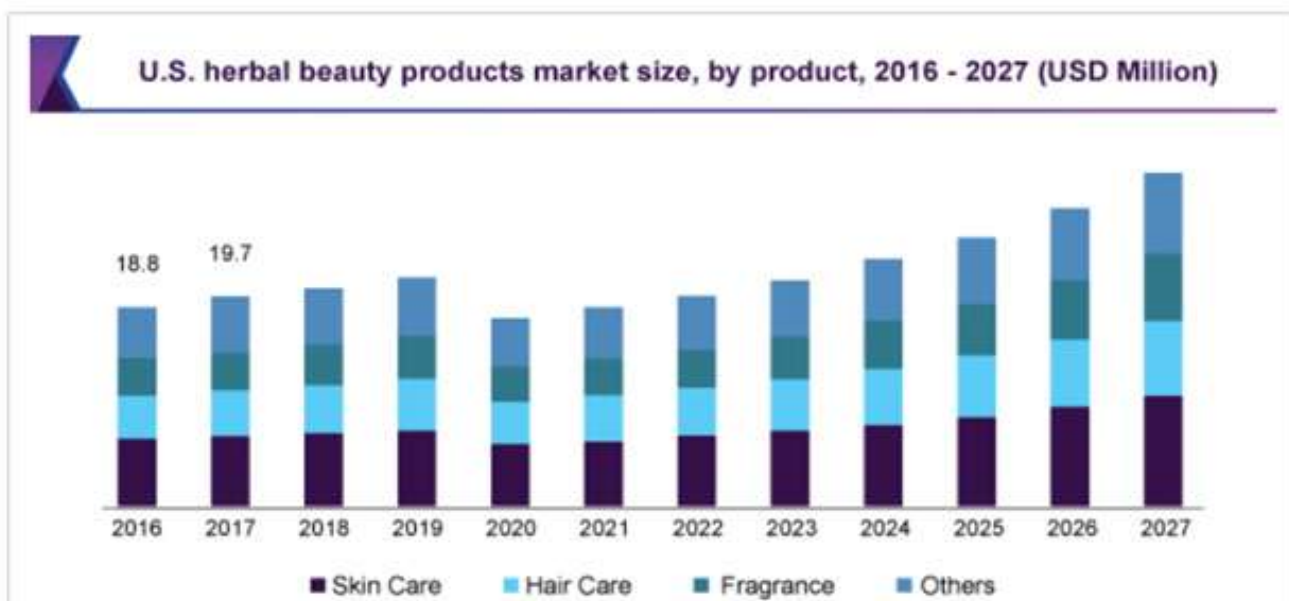
Figure 2: Trends of aromatics/herbs import to EU-market from 2015-2019



As shown in Fig. 2 above, the volume of import of aromatics/herbs to the European countries from the year 2015 to 2019 increased by 34.4 % with a value increment of 32.4 %. On average, those countries import 240,400 tonnes of product. However, the global export trend seems to have declined a little from 2017 to 2018. Whereas the general trend indicates growth. The majority of fresh aromatics/herbs are sourced within Europe. But despite the preference of local produce, a significant amount of products is still imported from non-EU countries. The supply from the main non-European suppliers seems to be stable and a rough estimation of the non-EU market share would be between 5 and 10%. Countries such as Kenya, Morocco, Thailand, Jordan, Israel and Turkey supplied over 50 million Euros worth (CBI, 2020).

Analysis of herbal related cosmetic products and use solid, semisolid, liquid, capsule forms of several thousands of green herbal cosmetics and beauty care originated from MAPs are circulating in global market channels. The trend indicated in figure 3 below represents of the utility of the products by human being both men and women. In 2019, cosmetics and beauty products were the world’s 57th most traded product, with a total trade of \$56.7 billion. Between 2018 and 2019 the exports of those products grew by 5.21%, from \$53.9 billion to \$56.7 billion. Trade in cosmetics and beauty products represent 0.31% of total world trade. The top importers of cosmetics and beauty products were China (\$8.71 billion), Hong Kong (\$4.9 billion), United States (\$4.78 billion), Germany (\$2.67 billion), and Singapore (\$2.59 billion) whereas the exporters at the same year (2019) were France (\$10.1 billion), United States (\$6.15 billion), South Korea (\$5.41 billion), Japan (\$4.49 billion), and Germany (\$3.77 billion) (OEC, 2021). But this figure further projected to show that the global herbal medicine market is known to grow from USD 230.03 billion in 2021 to USD 430.05 billion in 2028 at a CAGR of 11.32%.

Figure 3: Trends of herbal and beauty products market size by the nature of products as an example in Europe



Source: Global Insight, 2018

4.5.2 Market Channels

Studies showed that producers of MAPs and their derivatives of cosmetics and beauty products used to circulate primarily for well-established local, regional and international markets. Some of major market innovation channels currently implied worldwide is demonstrated in figure 4 below.

Figure4:- Examples of herbal and beauty products market distribution channels globally

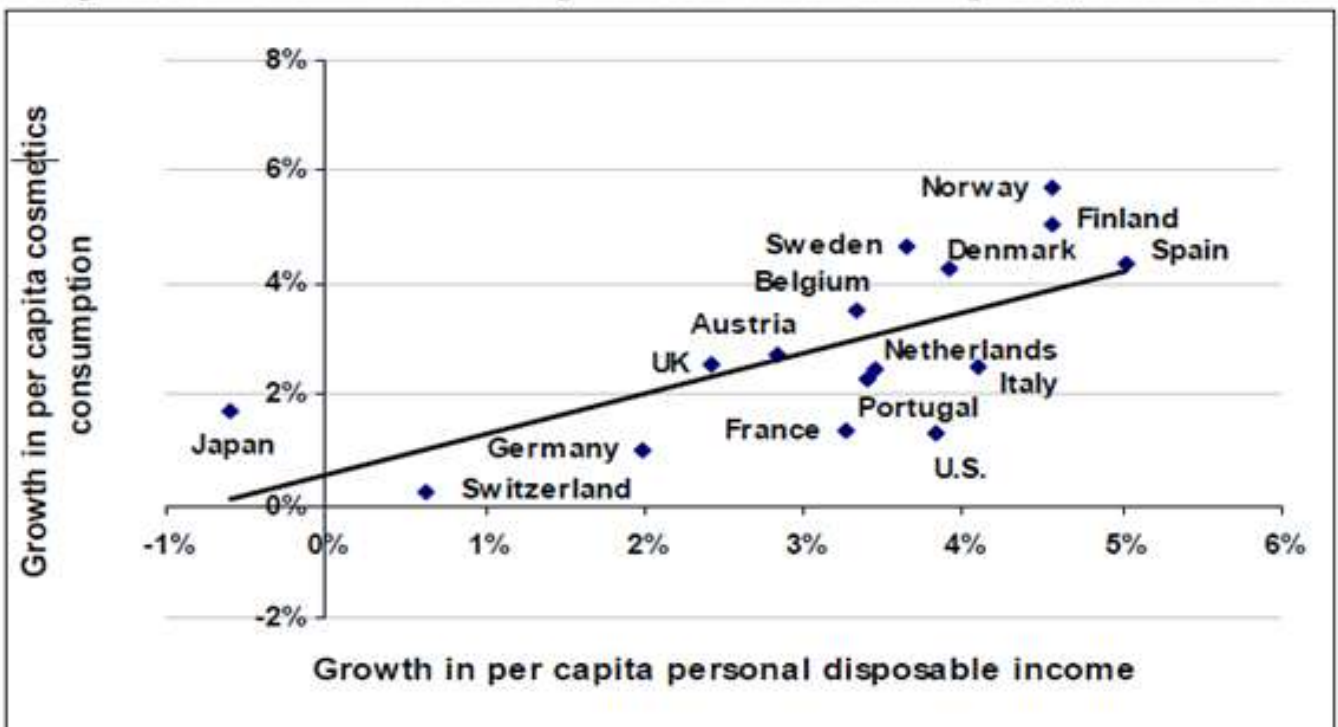


Source: Global Insight, 2018

a) Per capita Consumption Trends of Herbal/ Cosmetics

Assessing existing about data on per capita cosmetics spending by prosperous nations reveal that the average among the European 27 countries is €128 per year. Denmark and Sweden have had the highest consumption of cosmetic products at value of €171, followed by Spain at €169 and France at €166. Spending per capita is low in Greece and Portugal at just €121 and €104, respectively. Over the studied periods 2000-06, there was sluggish per capita consumption growth in two of the large European markets, France and Germany, and somewhat better performance in Italy and the United Kingdom. In contrast, there was strong growth in the high per capita consumption correlated to increased tendency of individual income levels, lifestyles and GDP of studied nation. Similarly, data analysis attempts made using a correction (fig 5) for purchasing power parity (PPP) per capita cosmetics spending was €174 in Japan, €127 in the U.S. and €24 in China. Such trends are projected be increased with driving power of economic and population growth by 20130.

Figure5 – Examples of Growth in Per Capita Cosmetics Consumption of cosmetics and beauty, 2000 to 2006 in Europe



Source: Global Insight, 2018

b) The Leading Global Herbal and Cosmetics Producing Companies

There are several thousands of companies producing, processing and marketing herbal based cosmetics and beauty products in the world, for instance in Germany only there are about 3600 companies trading on MAPs business. Some of the prominent market players in the herbal beauty products market globally include, Weleda AG, Bio Veda Action Research Co., Arbonne International, LLC, Vasa Global Cosmetics, Klienz Herbal Pvt. Ltd., The Himalaya Drug Company, Shahnaz Ayurveda Pvt. Ltd, Lotus Herbals Limited, Marc Anthony Cosmetics, Inc., and Hemas Holdings PLC.

4.5.2 Economic Importance of Aromatic Plants /Herbs in Ethiopia

i. Diversity, innovations and production potentials

Ethiopia is home to a variety of diverse types of herbs, thanks to its suitable agro-ecology, fertile land, multiethnic culinary traditions and wide traditional medicine practices. Herbs are mainly grown naturally on open fields and in backyards in rural areas, and over 95% of production by smallholder farmers is consumed domestically. There are estimated to be more than 6,500 species of vascular plants in Ethiopia, of which an estimated 10% are endemic and about 14% are used as medicinal plants (EBI, 2020).

According to the World Health Organization, 80% of Ethiopians rely on traditional herbal medicine as their primary form of healthcare; 95% of their livestock depends on the same medication; and 95% of traditional medicines are of plant origin (IBC, 2007)

Nationally, production volume and area covered by aromatics/herbs are not thoroughly recorded either by Central Statistical Agency (CSA) or Ministry of agriculture (MoA) due to little emphasis given to the sector and a fragmented production system. However, Wondogenet Agricultural Research Center Botanical Garden (WARC) as well as Federal and SNNPR Coffee, Tea, and Spice Authority office are currently working on the sector and more data expected to be published in the near future.

Generally, the production of herbal plants in Ethiopia can be divided into three schemes namely wild collections, small scale and large scale production systems. Wild collection and simultaneously in garden growing of aromatic/herbs plants in Ethiopia has remained predominantly traditional over the centuries, being produced mainly by smallholder farmers operating on small plot of land around homestead and in natural forests. Most of the herbs or aromatics plants are perennials; their cultivation contributes positively for soil conservation. However, this kind of production contributes least significance to the overall production in the country level. The diversity and agro ecology of MAPs in Ethiopia is indicated in appendix 3.

Essential oils production has rapidly increased because of the growing number of consumer’s preferences for healthier foods due their negative perception of synthetic additives in health. For this reason, trends have targeted the use of natural plant extracts as source of food additives. As consequence, enormous quantities of aromatic plants and fruit peels are used in the essential oils production around the world, thereby creating a huge amount of by-products. The by-product includes biomass and water containing some essential oil. In some cases, these are disposed to produce compost or as part of livestock feed or used for energy source like briquette; however, others are not properly managed that lead to pollution and environmental problems worldwide.

ii. Research Status for Technology and Knowledge Transfer

The survey results indicated that a total of 134,541.98 hectare of land has been covered by aromatics/ herbs in the three major regions of the country: Amhara, Oromia and SNNPR with 94 % accounts for eucalyptus (WARC, 2015). The research efforts indicate that the existing major herbs (tab.1), productivity assessments (tab.2) and diversity of species (fig.6).

Table 1: Overview of Ethiopian Aromatics plants production

Sr.No	Aromatics/herbs Product	Total Area (Ha)	Percentage Share
1	Rosemary	312.73	0.23
2	Rue	340.67	0.25
3	Basil	6104.88	4.54
4	Ariti	278.18	0.21
5	Thyme	119.76	0.09
6	Koseret	306.25	0.23
7	Eucalyptus Globulus	127000	94.39
8	Other (Citronella, Palmarosa, Citodora, Sweet Majoram, Mints, Geranium, Stevia, Chamomile, Bamask Rose)	79.51	0.06
	Total	134541.98	

Source: WARC, 2017

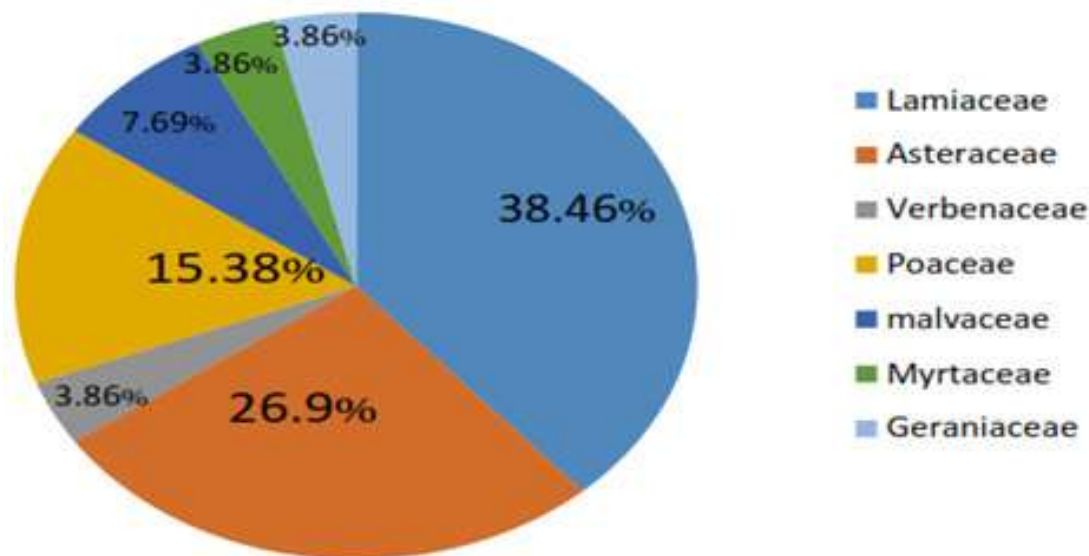
The study further indicated that there have been potential to produce from 156-158 tons of aromatics leaf and also from 645-647 liters essential oil capacity with a majority of Lemongrass (*Cymbopogon citratus*), Rose scented geranium (*Pelargonium graveolens* Herit) and Spearmint (*Mentha spicata*). The botanical garden provides plants for research, education and for conservation purposes. Local small-scale farmers, commercial farms, local NGOs engaged in distillation works, universities and traditional herbalists are the main beneficiaries.

Table 2: Comparative assessment of medicinal and Aromatic plants that are suitable at high land agro-ecology with their yield performance by WARC

No.	Plant Name	Main products	Estimated yield	
			Leaf	Essential oil
1	Sage (<i>Salvia officinalis</i> L.)	Herb and oil	10 tones	145 liters
2	Stevia (<i>Stevia rebaudiana</i> Bertoni)	Herb	6 tone (dried)	-
3	Oregano (<i>Oreganum vulgare</i>)	Herb and oil	8.5 tones	45 liters
4	lavender (<i>Lavendula angustifolia</i>)	Essential oil	2.5 tones	30 liters
5	Lemon verbena (<i>allosia thriphylla</i>)	Herb and oil	8 tones	25 liters
6	Rose scented geranium (<i>Pelargonium graveolens</i> Herit)	Essential oil	20 tones	35 liters
7	Rue (<i>Ruta chalepensis</i>)	Herb and oil	8-10 tones	8 -10 liters
8	Basil (<i>Ocimum basilicum</i>)	Herb and oil	10 tones	45 liters
9	Lemongrass (<i>Cymbopogon citratus</i>)	Herb and oil	55 tones	225liters
10	Peppermint (<i>Mentha pepperita</i>)	Herb and oil	13 tones	43 liters
11	Spearmint (<i>Mentha spicata</i>)	Essential oil	15 tones	44 liters

Source: WARC, 2021

Figure 6: Distribution of Species varieties developed, evaluated and registered and being maintained at Wondogenet Agricultural Research Center Botanical Garden.



Furthermore, research studies showed that the comparative advantage of aromatics plants to encourage investments in Ethiopia were calculating by taking the selection criteria market (maximum point, 40%): availability of the product on the international market, large scale potential (30%): distribution, drought resistance, biomass yield (yield / hectare), degradable land rehabilitation potential and diseases resistance, harvesting cycle (15%) and essential oil content Lt/kg or v/w (%) (15%).

The production shares of essential oil from Globules, Lemon grass, Citronella, Palmorosa, Frankincense (Bosolia), Rosemary and Myrrh (Commiphora spp.) is 47%, 20%, 15%, 10%, 5%, 1% and 1% respectively. Whereas the global market share Orange essential oil, Eucalyptus cineole essential oil, Corn mint essential oil, Citronella essential oil, Peppermint essential oil, Eucalyptus Citrodira essential oil and Lemongrass essential oil were 51 %, 8%, 8% 6%, 5%, 4% and 4% respectively. Therefore, in Ethiopia Eucalyptus globules variety type G2, Lemon grass variety type G3, Citronella variety type G3, Rosemary variety type G1, and Lavender variety type G2 have comparative advantage in Ethiopia with a rank from 1 up to 5.

Table 3: Comparison of aromatics plants based on market demand, scale of production, yield and comparative advantage.

Types of Aromatic plants	Market demanded		Large scale potential		Yield		Comparative advantage		Total (100%)	Rank
	Point (5)	40%	Point (5)	30%	Point (5)	20%	Point (5)	10%		
Eucalyptus globulus G2	5	40	5	30	5	20	5	10	100	1
Lemon grass G3	4.5	36	5	30	5	20	4	8	94	2
Citronella G3	4.0	32	5	30	5	20	4	8	90	3
Rosemary G1	3.5	28	5	30	5	20	4	8	86	4
Lavender G2	3	24	3	18	5	20	3	6	68	5
Palmorosa (cymbopogon martinii)	3.5	28	2.5	15	3.5	14	3	6	63	6
Mint (peppermint) G2	4	32	2	12	3	12	3	6	62	7
Chamomile	4.5	36	2	12	2.5	10	2	4	62	7
Sage	3.2	25.6	2	12	3	12	3	6	55.6	8
Artemisia annual	1	8	4	24	3	12	5	10	54	9

iii. Private innovators producing and processing aromatic herbs

Besides this, the local companies like Green mark herbs, Green way (Green Path foods), Joytech, Tabor and Ethio Agri - CEFT plc. being participated in the cultivation of aromatics/herbs and contributes a lot for this sector. Aromatics/Herbs like Chamomile, Coriander, Fennel, Spearmint, Peppermint, Basil, Damask rose, Hibiscus, Marjoram, Thyme, Rosemary, Stevia, which have been cultivated regularly in

Ethiopia have economic value for export. The cultivation of these plants is concentrated in the three regional states of Ethiopia such as Oromia, SNNP and Amhara (see appendix 1).

Due to their potential, the development of medicinal aromatics/herbs plants sub-sector are receiving increased recognition as an answer to some of the problems facing today's agriculture. This is significantly helpful for agricultural diversification, export promotion, local processing and create markets that are essentially noncompetitive with existing crops. In addition, the production and processing of herbs and aromatic plants would also provide a reliable domestic source of essential industrial feed stocks such as unique essential oils and herbal products, many of which are currently imported through allocation of huge foreign currencies.

Table 4: Fresh herb producing companies in Ethiopia

Company name	Location	Types of herb Grow	Area (Ha)
Green way Plc	SNNPR	Rosemary, Lemon grass, Rue	24
Terra Plc	Debre Birhan	Rose flower	20
Green mark Herbs Plc	Hawassa	Basil, Rosemary, Mint, Sage, Lemon grass, Thyme	41
Joytech Plc	Debre Zeit	Basil, Chives, Rucola, Tarragon, Rosemary, Thyme	63
Total	Total	Total	148

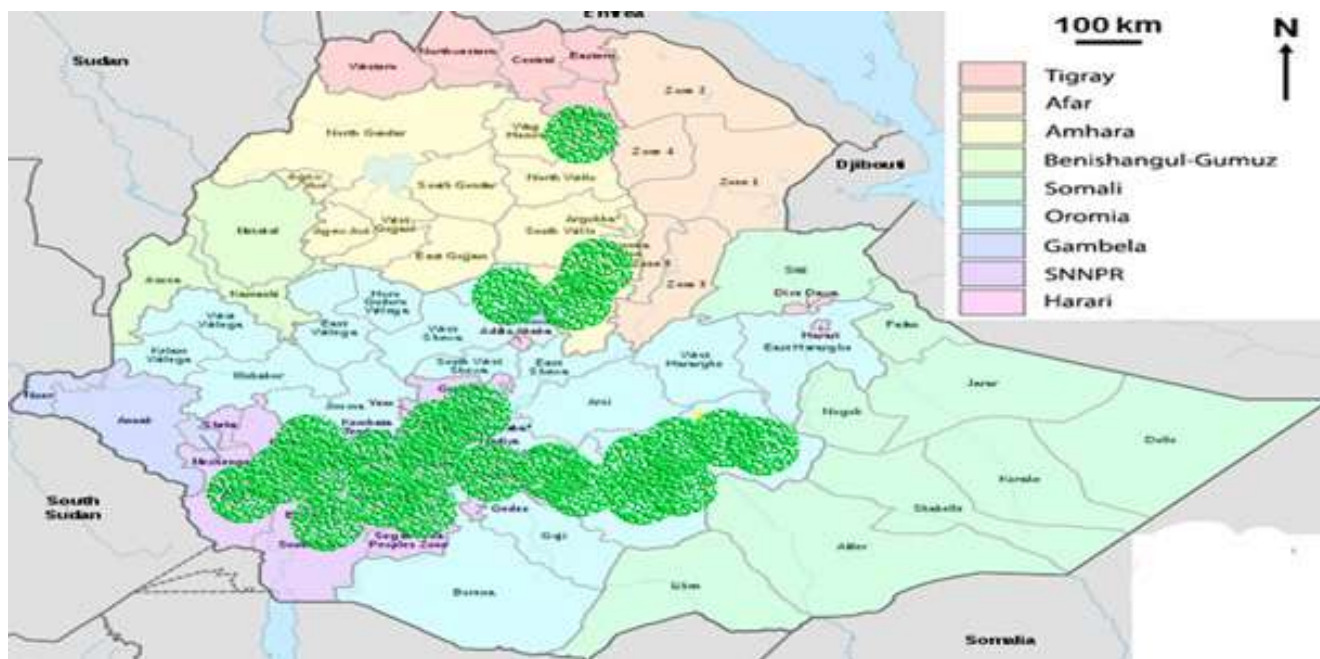
4.5.3 Regional production and marketing Status/Situation

The potential area for production of essential oil bearing plants in Ethiopia (fig.7) is mainly in Amhara, Oromia and SNNP region. In Amhara mainly produced around Debre Birhan, where as in Oromiya region Bale, Feche areas are the main producers. Majority of producing areas are in SNNP region include Arba minch, wondogenet, Gofa, siltie etc. Species that belong to Lamiaceae family hold greater number of species (38.46%) and followed by Asteraceae family (29.6%). Leaves are the most widely used plants part for aromatic as well as medicinal purposes. Lemon grass, citronella, eucalyptus, geranium and mint are some among the most widely used plants for oil production (Banjaw DT, et al., 2016).

SNNP Region:-it has also very fertile and has an agro-ecology suitable for growing a variety of crops, including herbs. Even though there is no detailed record of data, a recent assessment by the regional bureau of Agriculture and Natural Resource, Coffee, Tea and Spice Authority, estimated the land harvested area for selected aromatics/herbs are 7578.8 and 13781 hectares for the year 2019/20 and 2020/21 respectively. The growth in area of coverage for the commodity increased by 45 % in 2020/21 (fig.8).

The data shows that *Artemisia afra*, Rue, *Thymus serpyllum*, Rosemary, *Cymbopogon citratus*, and *Oregano* (*Lippia abyssinica*) increases in area coverage from 2019/20 to 2020/21 harvesting season by 95%, 89.2%, 86.7%, 80.8%, 77%, and 73.9% respectively. However, Basil and *C. sativum* decreases by 1022.9% and 4.5% respectively. According the data obtained from SNNPR coffee and tea authority demonstrations that 98.569 % of smallholder's farmers produce aromatics/herbs in their backyards, and the rest 1.43 % grows in wild forest. No farmers produce aromatics/herbs as a specialized farming.

Figure 7: Geographical and agro-ecological presentation of MAPs growing areas in Ethiopia



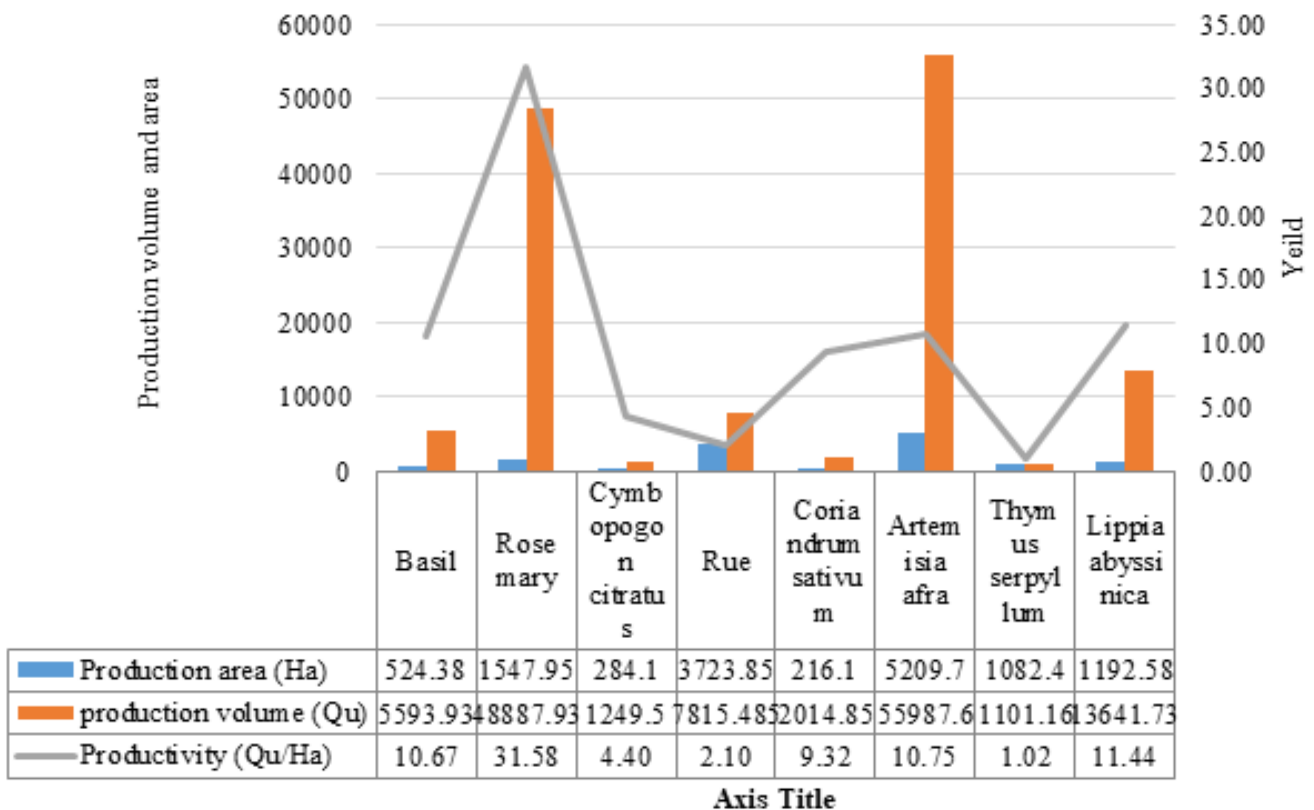
As it is clearly shown in Table 1-4, the productivity of rosemary is very high (31.58 quintal per hectare) as compared to other commodities. The second aromatic commodities having high yield is Oregano (11.44 quintal per hectare), followed by Artemisia afra (10.75 quintal per hectare), Basil (10.67 quintal per hectare), Coriandrum sativum (9.32 quintal per hectare), Cymbopogon citratus (4.40 quintal per hectare), Rue (2.10 quintal per hectare) and Thymus serpyllum (1.02 quintal per hectare).

Almost one third SNNP regional aromatics/herbs production covered by Gofa zone, followed by Siliti, Gurage, Kembata Timbaro, and Gamo by 27%, 16.8%, 8.5%, and 6% respectively. The rest Hadiya, Dawro and others accounted for almost 1% from the total production volume .

Oromia Region:-smallholders in Oromia Region produce a variety of crops for their livelihoods, including herbs in their backyards for their own consumption. However, there is no significant record of herbs that are produced in the region (fig.9).

Figure 8: Selected Aromatics/herbs productivity, production area and volume for 2020/21 harvesting season in SNNNP Region.

Production area, volume and productivity for selected aromatics/herbs plant in SNNPR (2020/21)



In the Oromia Region Bureau of Agriculture attempted to record spices and herbs from 2010–14, but the only figures recorded were for rue and basil. Even if it is difficult to infer the overall growth in production, one can observe that there is high potential for growing these and other high-value herbs in the region. The recording trend did not continue after 2014, despite most of the commercial producers of herbs in Ethiopia being located in Oromia.

High production of rue was obtained in 2013 which was 1397 quintal but the productivity is lower as compared to 2012 and 2010. On average 767.6 quintals of rue was harvested per year with a productivity of 27.56 quintal per hectare at Oromia. The productivity of rue at Oromia region is very high as compared to SNNP region.

When we look at basil data, 1333.6 quintal with yield of 22.38 quintal per hectare was produced on average at Oromia region. Maximum production volume and productivity was obtained in 2012. The productivity of basil is also higher than SNNP region.

Amhara Region:-in Amhara region, aromatics/herbs (tab.5), as in other regions, are produced in backyards for household consumption, with only the surplus coming to the market. Still, there is no official record data of aromatics/herbs by federal as well as regional agricultural bureau. The assessment data for only North Shoa Zone, which is in Amhara region, shows that almost 98% of aromatic/herbs production was thyme (155200 quintals) with much better productivity, followed by rue, basil and coriander.

The productivity of thyme (2.3 Qu/Ha) and rue (62.23 Qu/Ha) was almost double as compared to SNNPR (1.02 Qu/Ha) and Oromia (34.08 Qu/Ha) region respectively. However, coriander productivity was decreased by 57.5 % as compared to SNNP region.

Figure 9: Selected Aromatics/herbs productivity, production area and volume for 2010-2014 harvesting season in Oromia Region.

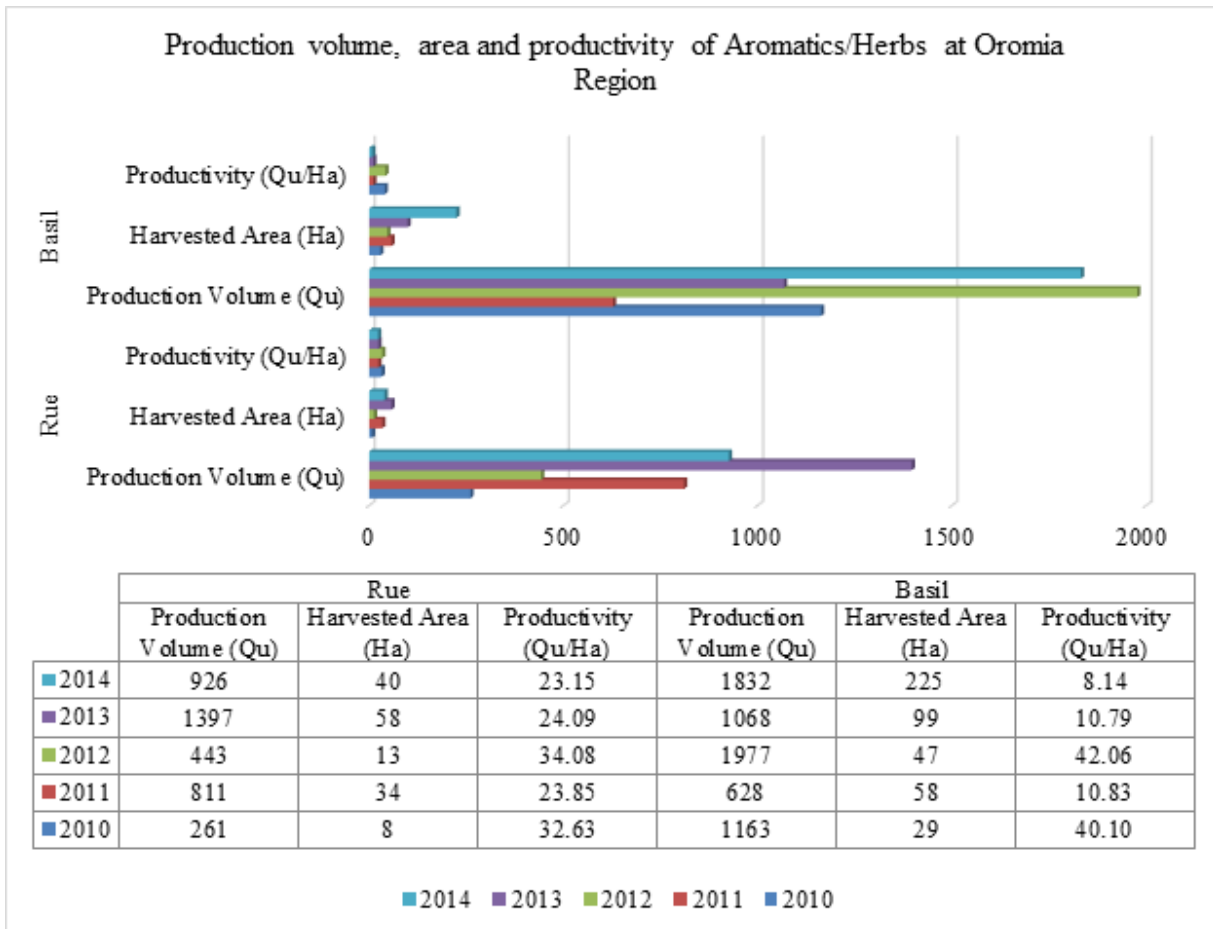


Table 5: Aromatics/Herbs Production at Amhara Region at 2019

Aromatics/Herbs	Production area (Ha)	Production Volume (Qu)	Productivity (Qu/Ha)
Thyme	67,350	155,200	2.30
Coriander	43	170	3.96
Basil	12.6	840.7	66.72
Rue	18	1120	62.23
Total	67,424	157,331	2.33

4.5.4 Domestic Demand, Consumption and Trade Patterns in Ethiopia

Domestic demand:-there is also a clear industrial demand for MAPs biomass, extracts and cosmetic applications, thanks to the increased production of herbal health care formulations; herbal based cosmetic products and herbal nutritional supplements. In addition, traditional health care practitioners, traditional healers and consumption at the household level have all contributed to the demand for herbal medicinal products. Finished products made from medicinal and aromatic plants are increasingly prescribed and

bought over the counter. With respect to source of market, Barbieri (2018) mentioned that demand comes mostly from the following markets: food and beverage (35%), fragrances, cosmetics and aromatherapy (29%), household (16%), and pharmaceutical (15%). As consumers have become increasingly conscious of the health benefits of essential oils, inclinations for foods and beverages containing these volatile oils as additives have developed.

The demand and supply for oleoresin and essential oils originated from MAPs in Ethiopia observed to be obtained through import. On average, in Ethiopia more than 6 million US dollar has been allocated every year to import the aromatic (CIA, 2010). This presents the existence of huge demand for the product and the burden it is exerting on the country’s foreign exchange (Fire, 2016). Currently, industrial demand for aromatic is also met through import. Those various types of aromatic that are imported to Ethiopia can be categorized under some major groups according to their application. These are for: Perfumery, Pharmaceutical, Cosmetics, Toiletries, and Confectionery industry. The local demand for pharmaceutical, cosmetics, soap and detergent factories, alcohol and liquor industries ingredients is relatively increasing over time. The local industries import over 50% of the raw material requirements mainly from India, Brazil, Israel, South Africa and Germany.

Moreover, according to Ethiopian Institute of Agricultural Research, the local demand for essential oils extracted from MAPS was estimated to be 1800 tons. The report also indicated that the demand for essential oils and odoriferous substances has increased fourfold between 1997 and 2011. The market at that time was estimated to grow at a 14% CAGR. The major essential oils extracted in Ethiopia are from Eucalyptus, Lemongrass, Mint and Rosemary. In addition, there is one company, Terra PLC that extracts Rose oil primarily for a German company.

In general, Ethiopia consumed a huge amount of essential oils, herbs and modern medicines. This indicates that there is existence of high demand for essential oils, aromatics herbs, medicinal plants and their applications. Therefore, even though the sector is in progressive stage, it is important to do in harmony to increase the market size of medicinal, aromatic/ herbs plants, and extract products within the local market to solve the consumption problem of the increasing population of the country.

A. Trends and comparison of Ethiopian herbal products with other countries

When we look at the Asian continent, India is the world’s second largest exporter of herbs/ aromatics plants after China and both the countries together produce more than 70% of the total global demand for herbal products. India has varied agro-climatic regions and biodiversity hotspots thus possessing a substantial amount of biodiversity of medicinal plants - 8000 varieties of medicinal plants available with 6200 indigenous varieties of herbal plants. India’s herbal sector represents about 8500 licensed herbal units, thousands of extractors or semi processors, export houses & cottage-level units of herbal-based products (Centre for Aromatic Plants (CAP) and HRDI, 2019). Table 6 and 7 shows comparison of Ethiopian herbal products with benchmark countries (see appendix 2).

Table 6: Ethiopian and Indian Aromatics/herbs production area coverage.

Sr. No	Aromatics/Herbs Commodity	Indian practice	Ethiopian practice
1	Damask Rose	73 ha	20 ha
2	Lemon Grasses	660 ha	-
3	Mint	6005 ha	79.51 ha with other like chamomile, palmarosa, majoran, citronella....
4	Chamomile	181 ha	

Africa continues to be a significant source of a wide range of native medicinal and aromatic plants serving the global food, cosmetic, pharmaceutical, herbal and dietary supplement industries, originating an estimated annual worldwide trade value of USD 60 billion (CFC, 2021).

The global competitiveness of Ethiopian herbs is evaluated from three angles: yield per hectare, quality in terms of oil content, and price. The yield of production per hectare of land is an important factor, which makes a specific area to invest in more attractive. Ethiopia is competitive because of having the right agro-ecology for producing greater yields per hectare for quite a number of types of herbs. Similarly, the content of oil is one of the parameters to gauge the quality of herbs. Ethiopian herbs are more competitive in oil content compared to other herb-growing and exporting countries. Table 7 shows the yields per hectare of different herbs in a selection of different countries.

Table 7: Yield per hectare of Ethiopian Herbs Compared to other countries

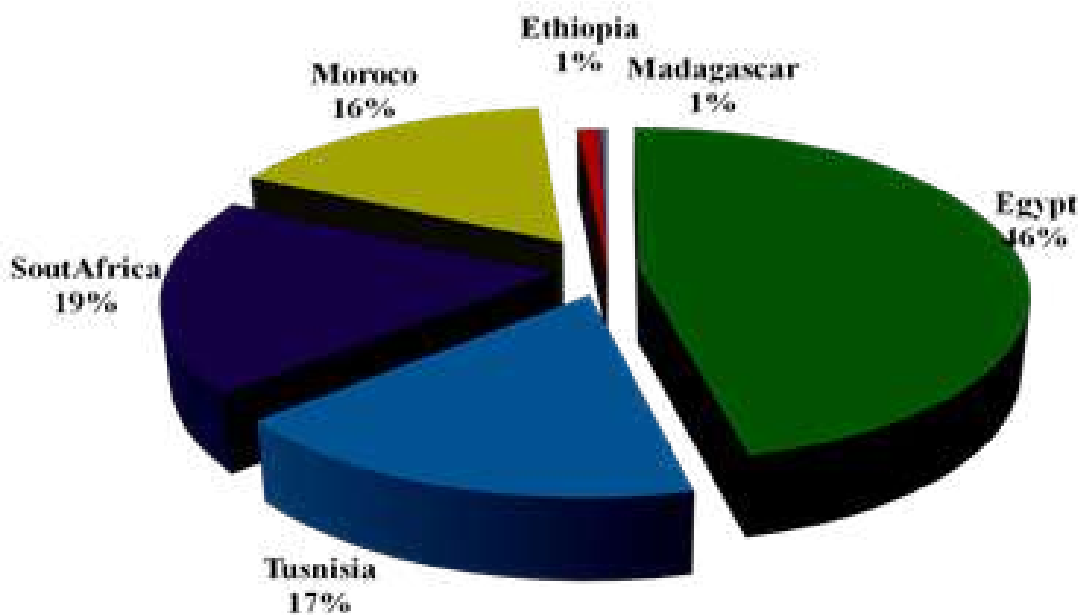
Aromatic/	Ethiopia	Iran	Turkey	USA	India	S o u t h Africa	Italy	Poland
Herbs	18.1-67.9	11.66-12.37	53.8-83.7	45-72				
Spearmint	23.8-95.6					78.3		
Peppermint	33.6-64.7				20-50.55			
Rosemary	23.1-69.8							15.2-17
Oregano	30.67-240						271.5	
Sage								

Source: Addisu, 2019 (Competitive study of Herbs and Aromatic Plants, 2019)

The essential oil content is one of the parameters to gauge the quality of herbs. Ethiopian herbs are more competitive in oil content compared to other herb-growing and exporting countries. Even if the current share of Ethiopia’s aromatic in Africa is minimal, the country has diverse agro-ecology and bio-diversity to cultivate different aromatic and herb plants. This implies that the production of aromatic can be scaled to match global and local market if appropriate measures are taken. There is also growing international and domestic demand that provides an opportunity for the herbs and essential oils sectors development of Ethiopia.

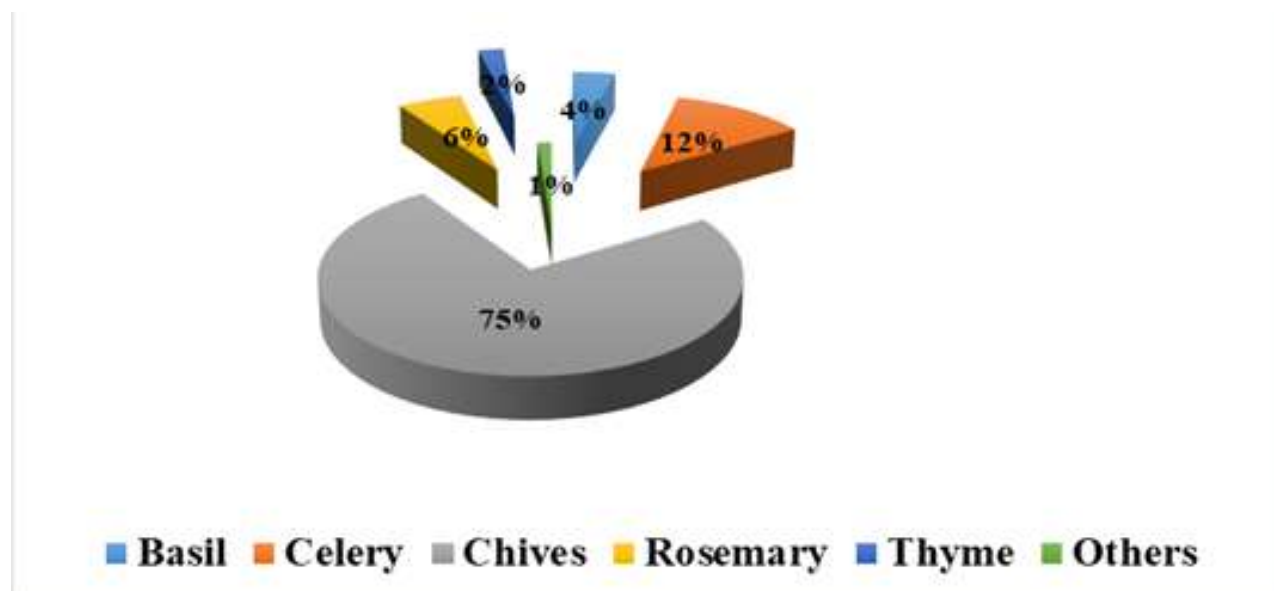
Compared to other aromatic producing African countries, Ethiopia (1%) same as Madagascar (1%) takes the least share of aromatic production in the continent. Egypt (46%) takes the loin share of aromatic production, followed by South Africa (19%) and Tunisia (17%) (fig.10). According to the information obtained from key informant interview from essential oil processing company and FBPIDI the major reason for Ethiopian weak export performance in essential oil sector is due very poor linkage with the aromatics producer and unsustainable supply of raw material. Most the investors are not interested to engage in this mainly by two reason, maintaining organic-ness of the product and challenges access to finance as well as land. Beside the government and financial institutes are not aware the importance of the sector due to this access to land and finance is very challenging, Ethiopian herbal product exports situation.

Figure 10: Proportion of Ethiopia essential oils production compared with some major aromatic producing African countries; Source: ENTAG, Ethiopia-Netherlands Trade for Agricultural Growth



Ethiopia exports a total aromatic /herbs of 741,011kg, 966,591kg, and 685,097kg for the year 2016/17, 2017/18, and 2018/19 respectively. On average for the period 2016/17-2018/19, Ethiopia exported 797,566.33 kg of aromatics/herbs of different types. (Figures 11 and 12). The three-year average data indicates that percentage share of exports are 75 for chives, 12 celery, 6 for rosemary, 4 for basil, 2 for thyme and the rest 1 percent for chervil, coriander (Cilantro), funnel, mint, parsley, rue, and tarragon.

Figure 11: three-year average percentage distribution of Aromatics/Herbs Export from Ethiopia 2016/17-2018/19

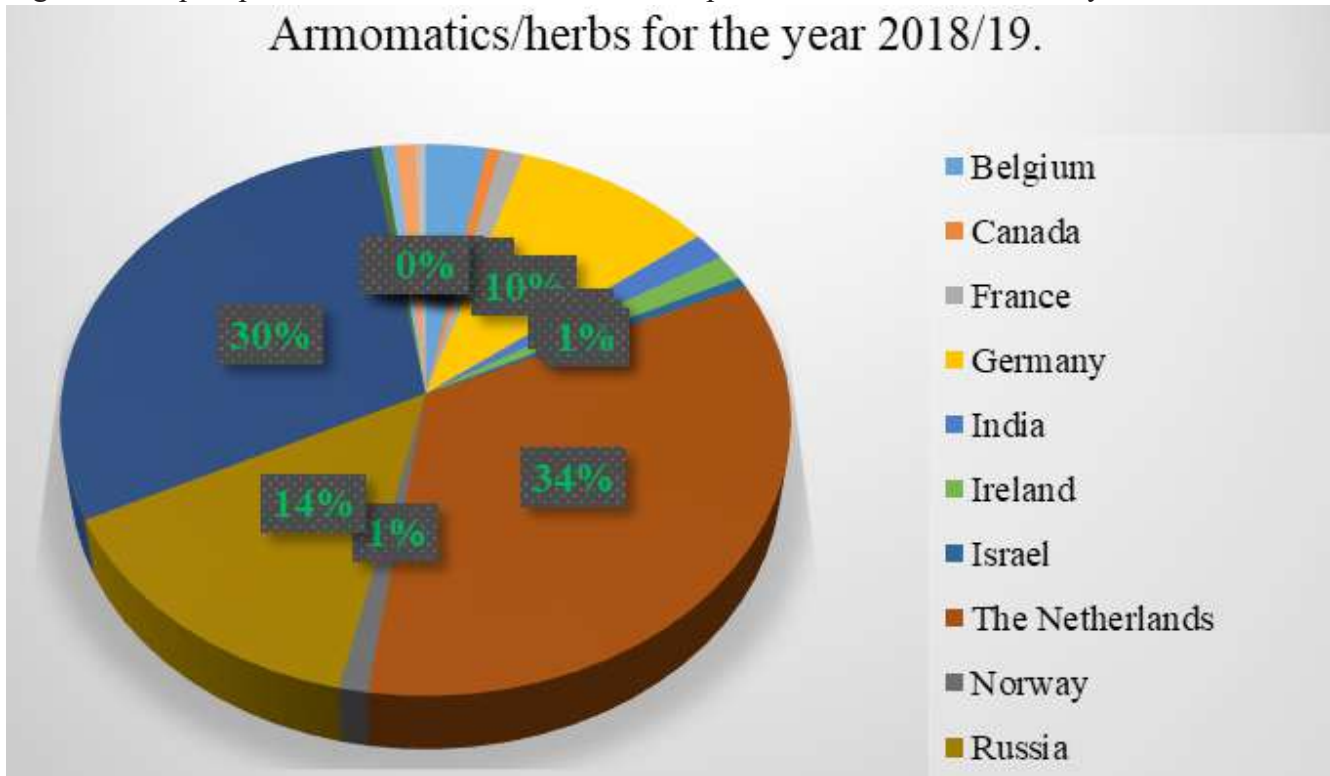


Source: MoTI (2020)

As shown in figure 12, the major export destinations for Ethiopian aromatics/herbs for the year 2018/19 are Netherlands (34%), United Kingdom (30%), Russian Federation (14%), Germany (10%), and

Belgium (3%). The overall herbs export to the EU accounts for over 95% of the national export portfolio.

Figure 12: Top Export Destinations countries for Ethiopian Aromatics/Herbs for the year 2018/19.



Source: MoTI, 2020

One of the observed gaps is that Ethiopia herbal products have huge chances to compete with suppliers from Egypt, Tunisia, South Africa, Kenya and Tanzania. It is also added that the major importers are from Spain, Italy and Eastern European countries. However, most of these companies have seasonality and dominate the market during the summer season. The fresh herbs suppliers have Global GAP certifications and others required by individual supermarket chains-example TESCO.

B. Ethiopian herbal-related products import scenarios

Herbs or aromatics Plants and parts of plants, including seeds and fruits, of a kind used primarily in perfumery, medicaments or for insecticidal, fungicidal or similar purposes, fresh or dried, whether or not cut, crushed or powdered exported with a value of 2,892,358 USD and 721,406 net weight kg whereas the import one is 77,530 USD and 54,889 net weight in kg for the 2018. (tab. 8).

Table 8: Trends of Ethiopia Aromatic/herbs Import (2009-2018)

Year	Export		Import	
	Trade value (USD)	Volume (kg)	Trade value (USD)	Volume (kg)
2009	\$105,790	17,586	\$12,735	1,906
2010	\$439,513	115,717	\$1,303	234
2011	\$845,294	293,530	\$22,901	2,596
2012	\$1,702,694	454,021	\$7,677	2,235
2013	\$2,871,263	625,605	\$24,509	2,211
2014	\$2,437,578	657,274	\$9,720	1,572
2015	\$2,605,406	662,382	\$32,004	4,276
2016	\$2,229,693	583,987	\$37,980	1,638
2017	\$2,083,584	577,777	\$56,238	60,517
2018	\$2,892,358	721,406	\$77,530	54,889

Source: UN-COMTRADE and ECRA (2021)

Importing of essential oil to Ethiopia may have effects. The key informant in the sector suggested that the imported essential oil might be synthetic. That why we import with cheap price. Synthetic Oils: sometimes known as natural equivalent, are primarily made from petrochemicals and attempt to duplicate the smell of a specific plant.

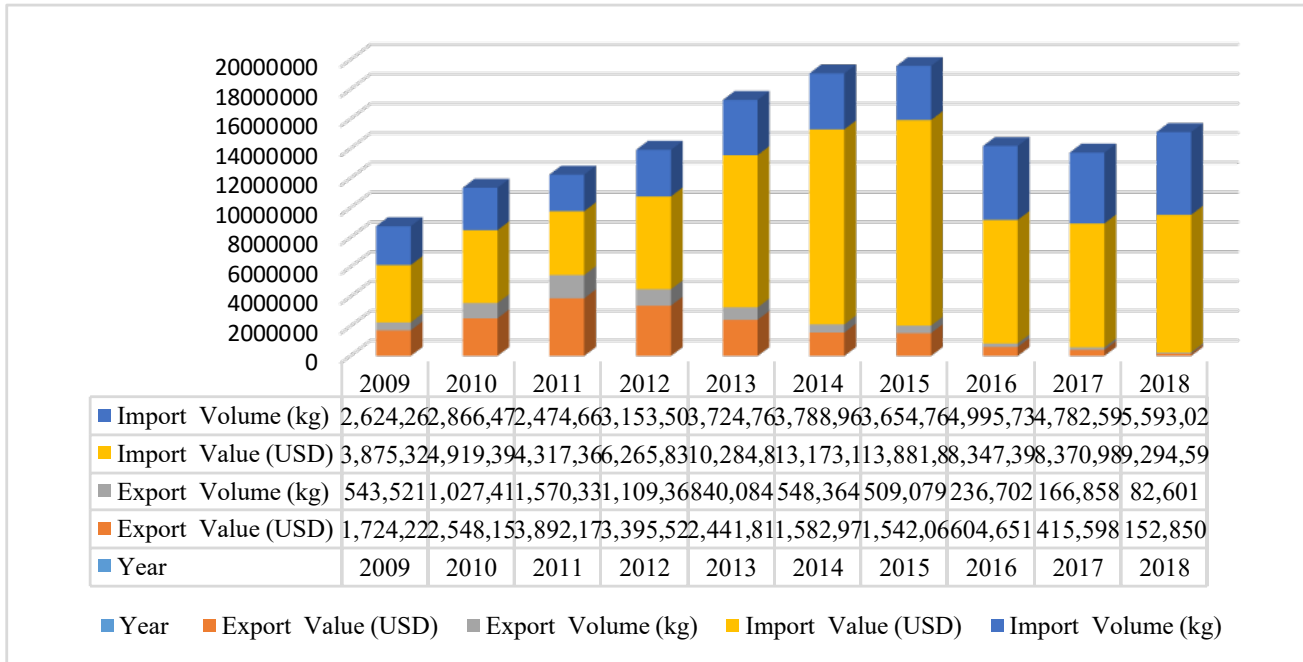
C. Comparing cosmetics import and export trade balances

The value of exports of cosmetics and beauty products from Ethiopia (fig.13) totaled \$15.2 thousand in 2018. The value of export in 2018 decreased by 84.4% as compared to 2017 (decreased by \$82.7 thousand). On average Ethiopia exports 29,252 kg of those product with a value of \$31.7 thousand. Top export destinations of cosmetics and beauty products from Ethiopia in 2018 were Djibouti with a share of 82%, Kenya with a share of 4.25% and South Africa with a share of 3.92% from the total export value.

The value of imports of cosmetics and beauty products to Ethiopia totaled \$9.15 million in 2018. The value of import to Ethiopia decreased by 16.3% in value terms compared to 2017 (decreased by \$1.79 million). On average Ethiopia imports 7,149,098 kg of those product with a value of \$3112 thousand. Top trading partners of Ethiopia in 2018 for cosmetics and beauty products was China with a share of 26%, Indonesia with a share of 25%, South Africa with a share of 14.5%, Germany with a share of 8.88%, United Arab Emirates with a share of 6.09%, Kenya with a share of 4.15%, Côte d'Ivoire with a share of 3.18%, USA with a share of 2.79% and India with a share of 1.91% from the total import for those products.

With regard to cosmetic products prepared for use on the hair such as Shampoos; preparations for permanent waving or straightening; hair lacquers; brilliantine's (spirituous); hair cream, hair dyes (natural, herbal or synthetic) Ethiopia imports huge amounts products. According to the data obtained from COMTRADE the country, earn a total of \$152 and \$415.6 thousand in 2018 and 2017 respectively. The sales decreased by \$262 thousand as compared in 2017 (see the detail in figure above). Top export destinations of the product from Ethiopia in 2018 was Sudan with a share of 28%, USA with a share of 16.1%, Switzerland with a share of 12.3%, Germany with a share of 12.2%, Netherlands with a share of 10.3% and Lebanon with a share of 10%.

Figure 13: Ethiopian Cosmetics products for hair application import vs export data



Source: UN-COMTRADE, 2021

The value of imports \$8.37 and \$9.29 million in 2017 and 2018 correspondingly. The import value for the commodity went up by 11% compared to 2017. On average Ethiopia imports 3.7 tonnes of the product by spending \$8.27. Top trading partners for import of the product in 2018 was China with a share of 37%, United Arab Emirates with a share of 16.3%, Turkey with a share of 9.14%, USA with a share of 7.77%, South Africa with a share of 5.44%, Spain with a share of 4.51%, Thailand with a share of 4.27%, India with a share of 4.04% and Sudan with a share of 3.58%.

4.6 Analysis and Mapping of the Value Chain, Market Flow and Business Model

4.6.1 Mapping the Value Chain

An attempt for mapping the value chain of the product or commodity is used to analyze the value chain, understand the characteristics of the chain actors and their link to one another. It is also useful to understand the flow of products, materials and information across the chain. Accordingly, in this study, aromatic plants value chain from cosmetics perspectives is mapped based on the relevant information collected while pursuing the study methodology defined.

The value chain of Aromatic plants is an array of processes starting from growing of the plants to consumption and use of aromatic plant products and their derivatives. The core processes (as depicted in figure 14) identified across the value chain include production of the aromatic plants, collection of the fresh or dried produces, processing or oil extraction, marketing of processed products and consumption. For the value chain to function properly, several actors are involved along the aromatic plants production, processing and marketing value chain.

The direct market actors are, those involved in aromatic plants trade, who order the flow of aromatic plants in time and space. These include producers, local collectors, primary cooperatives, unions, processors and consumers. The chain supporters are involved in technical advice, service provision and policy formulation and implementation of the chain. Technical advice, though limited, like extension services and marketing information along aromatic plants value chain provided by Development Agents, Bureau of Agriculture, Agricultural Research Center and NGOs. `

Main operational actors in the value chain processes and their functions

The main operational actors involved in the aromatic plant value chain processes are shown in Figure 14. These actors include public institutions, the private sector, traders, NGO's, farmers' cooperatives or unions, household farmers, commercial farmers and Associations. Each actor plays a wide range of roles. An overview of the value chain and the roles of the different aromatic plants value chain actors is displayed in the figure at below (14) and appendix 3.

Farmers: the initial value adding activities are carried out by farmers who produce the fresh aromatic plants and supply to the next level in primary market. The main farmers are individual holders and cultivate and grow in traditional practice. However, from the focused group discussion and key informants interview conducted in this study, there are cases in point those commercial farmers (in South nation nationalities region, Siltie zone) and non-organized out growers' association with importers and exporters. Sometimes, they dry the plants or herbs and supply to local market as well.

Local Collectors: they are the first link between producers and other traders or processors. Based on focused group discussants and key informants, these are small trading individuals who collect the product in small quantity directly from producers and resell to oil extractors and exporters in a more marketable quantity. They act as intermediaries who do not add value but merely share the benefit that could have accrued to the farmers.

They use their financial resources and their local knowledge to a relatively larger mass of aromatic produces from the surrounding area. They play important role and they do know areas of surplus well. Collectors are the key actors in the aromatic plants value chain, responsible for the trading of aromatic plants from production areas to wholesale and retail markets.

Processors: processors are the main value adding actors next to farmers in their logical sequence across the value chain. Processors in aromatic plants value chain are companies engaged in the extraction and packaging of the aromatic plants processed products which can be sold locally for different level of consumption and use. The processed products can also be supplied for international market. In Ethiopian conditions, processors engage in extraction of essential oil only or a combination of farming, extraction and export activities. The processors set or adopt product quality standards and ensure their system can produce the processed product as per the customer requirements. Processors can use Amber glass and High density polyethylene package (HDPP) as a package of essential oil products to avoid light transparency and transported at a temperature 80C to protect the essential oils from heat interaction.

Aromatic plants processors have better capacities in terms of finance and other facilities. There are some cases that processors work together with outgrowing individual holders so that cluster farming practiced. They provide price information, improved seed and advance payments for selected reliable clients. They have also better storage, transport and communication access than the farmers.

Retailers: Retailers are also important primary actors in the aromatic plants processors value chain in the study area. Their duty is to buy the product from farmers, collectors and processors and store it to their temporary storage. Then, by sorting and packing they sell fresh, dry or extracted oil to nearby consumers by negotiation.

Union and Cooperatives: It is obvious that, an option for sales outlet of the small-scale farmer is the cooperatives and unions. Unions can collect fresh and dried produces of aromatic plants from each farm household through their member cooperatives. The cooperatives in turn collect the aromatic plants mainly from their member farmers. The unions store and pack the aromatic plants and look for local or export sale outlets. However, this important actor is underutilized and inactive in the value chain of aromatic plants in the country. Currently, Silitie zone has one Union organized as 15 cooperatives in three kebele's. Most of them are females primarily engage to produce Koseret, Rosemary, Rue, Lemmen grass, and Thyme. In addition, the Zone has also clustered land for Rosemary farming. The main objective of the Union is to establish better market linkage and to avoid the middlemen intervention in the sector. For example, the Rosemary price increase from 15 birr/kg to 60 birr/kg due to the market linkage created by the union which was exploited by the middlemen. Damascene essential oils PLC has also purchase herbs and aromatic plant materials from 22 farmers who together form the ABARO farmers' union which is located near Wondogenet agricultural research center.

Exporters: The major operator in the aromatic plants market is the exporter. These are the largest buyers of aromatic plants from the wholesalers. These large-scale exporters, mostly located in Addis Ababa, have their own buying branches. These buyers buy most of the exported aromatic plants using different instruments. They buy on the spot market, on cash from anyone willing to sell, competing merely on prices.

Processors have better capacities in terms of finance and other facilities. There are some cases that processors work together with outgrowing individual holders. They provide price information, improved seed and advance payments for selected reliable clients. They have better storage, transport and communication access than other traders do.

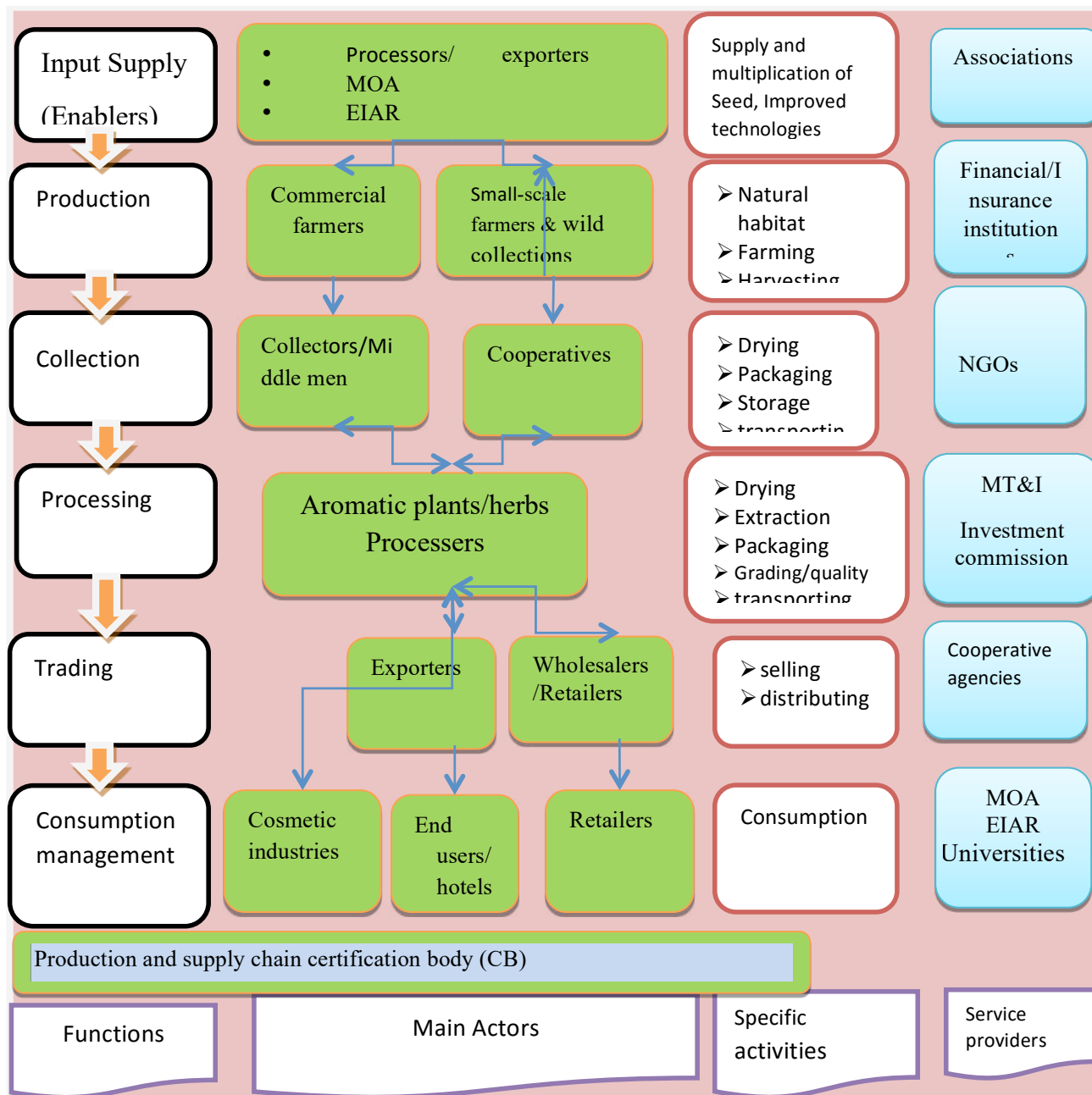
Consumers: aromatic plants/herbs and their derivatives are consumed by different end users. Locally; individual household consumers, cosmetic industries and hotels use for herbal medicines and aroma therapeutic purpose. The dried or extracted aromatic plants products are consumed by international customers for different uses such as ingredient for cosmetics industry.

Enabler/actors: Such actors are those who provide supportive services including training and extension, information, financial and research services. Access to information or knowledge, technology and finance determines the state of success of value chain actors. Primary cooperatives, micro finance, NGOS and government Office are main supporting actors who play a central role in the provision of such services.

Organic Certifier: Organic farms producing organic essential oils are inspected by export destination country accredited certifier to enforce organic standards. Only authorized certified organic handlers may distill, extract, process, import or export certified organic essential oils. Organic handlers, processors, and retailers all adhere to these standards. Certified organic essential oils need the entire production chain to be free of pesticides.

An organic certification implies that the product is a result of organic farming, which seeks to encourage environmental equilibrium and to protect as well as sustain biodiversity by incorporating environmentally- and animal-friendly methods that support the salvaging and reprocessing of resources.

Figure 14: Mapping of the main operational actors in the value chain processes and their functions

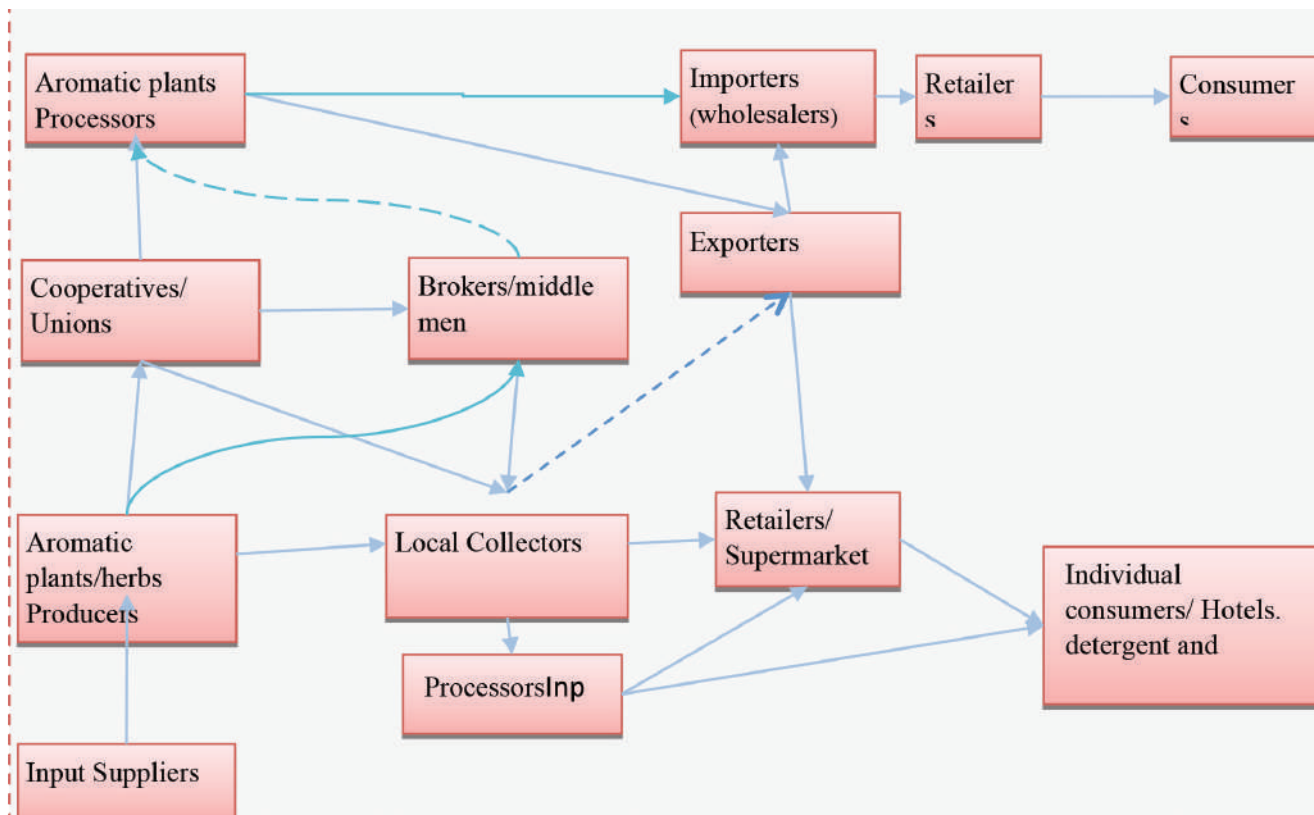


4.6.2 Market flow Map

In the market flow of aromatic plants, the flow of the product and finance as exchange from initial producers to final consumers is illustrated (Fig. 15 and appendix 3). Thus, farmers produce fresh or dried aromatic produces and directly sell to local collectors, processors, exporters, unions or individual consumers in the nearby market. On the other hand, the collectors, the major local market, with a relatively bulker amount and little or no value addition, pack, transport and sell to exporters, processors or retailers.

While receiving directly from farmers or indirectly from collectors, the processors participate in value addition activities and they dry, extract oil and pack the product which can be supplied to local and international market. They attempt to produce the product based on customer requirements, for base markets. The consumers including hotels, cosmetic industries, soap and detergent industries mainly receive their aromatic plants product from retailers, processors and collectors.

Figure 15. Ethiopia’s Aromatic plants market flow along the value chain mapping



4.6.2 Business model Analysis

In this study, it was exerted a Business Model Canvas (BMC) strategic analysis method of financial performance of the aromatic/herbs processing industries with a simple example on aromatic/herbs particularly by looking in to the financial implication of their business linkages. The Business Model Canvas is a strategic management and entrepreneurial tool that allows describing, design, challenge, invent, and pivot a business model. Recently, value chain analysis applies this tool to assess the backward and forward business relationships based on intended or unintended value propositions by actors.

Price Build up in the domestic market: - The prices make up and mode of bargaining on the domestic market along the value chain is through marketing survey (field and online) conducted by study team. Studies showed that the price (ETB) per kilogram of essential oil was 33000, 27500, 7260, 6600, 5280, 4620, 4114, 2860, 2464, 1980, and 924 (ETB/kg) for commodity Chamomile (Roman), Chamomile (German), Marjoram, Thyme, Sage, Lavender, Basil, Fennel, Mint (menthol), Mint (peppermint), and Rosemary respectively. According the weighting evaluation calculated in the table below:

Those aromatic/herb sales in fresh and dry biomasses. Most of the time the broker collects rosemary and koseret product from the farmer at an average price of 57.5 and 37.5 birr per kg for fresh product and they sent to merkato market since those products frequently needed for baltina processors (tab 9).

Table 9: Domestic Market Price Make up for Aromatics/herbs in ETB 2019/20

No	Value Chain Actors	Types of commodity	Average Price marks
1	Producer/Farmers	Rosemary	55-60 birr / kg for fresh
		Koseret	35-40 birr/kg for fresh 160 birr/kg for dry
		Basil	15 birr/kg for fresh 160 birr/kg for the seeds
		Rue	30 birr/kg for fresh
		Ariti (Artemisia Afran)	30 birr/kg for fresh
		Lemon grass	40 birr/kg for fresh
		2	Local Collectors (small traders, exporter and processor)
Koseret	210 birr/kg for dry		
Basil	25 birr/kg for fresh		
Rue	45 birr/kg for fresh		
3	Retailers	Rosemary	80 birr / kg for fresh
		Koseret	250 birr/kg for dry
		Basil	40 birr/kg for fresh
		Rue	70 birr/kg for fresh
4	Aromatic Producer	Eucalyptus Globules oil	2500 birr/lt
		Lemongrass oil	3314 birr/lt
		Lavender oil	4680 birr/lt
		Rosemary oil	7312 birr/lt
		Pepper mint oil	4387 birr/lt
5	By-product	Rose water	200 birr/lt

Source: Own Survey

Price Build up in the export market:- The average price builds up for basil, rosemary, and rue starts with 25, 50, and 20 birr per kg with price make up and this will end with 92.2, 69.4, and 118.3 birr per kg respectively at export market (tab. 10). The estimation price at market places is done based marketing survey (field and online) conducted by study team and found the result as indicated in table below (tab.10).

Table 10: Export Market Price Make Up for Aromatics/herbs in ETB (2019/21)

No	Value Chain Actors	Commodity type	Average Price marks (per kg in Birr)
1	Producer/Farmers	Basil	25
		Rosemary	50
		Rue	20
2	Export	Basil	92.2
		Coriander	119.7
		Mint	115.9
		Parsley	10.2
		Rosemary	69.4
		Rue	118.3
		Thyme	44.7
3	Essential oil	Damask Rose oil	419040

Source: own survey

4.6 Growth Opportunities and Challenges

4.6.1 Growth Opportunities

Based on the study perception assessment of senior professionals, literature review, survey, focus group discussion and key informant interview with different value chain actors, the following major growth opportunities for aromatic plants production, processing and marketing activities in Ethiopia were identified.

i. Production and processing

Suitable agro climatic conditions for cultivation of wide range of biodiversity: Aromatic bearing plants are diverse in the country. Naturally occurring wild aromatic plant species such as gums of different types are being exported in its raw state. Adding value to such products has got tremendous positive effect to the country's overall economy in the sector. In addition, the presence of many aromatic plant species which are internationally in the trade is being studied for their agro-ecological adaptation by Agricultural research centers and Biodiversity institute (example: Wondogenet research center). Therefore, the sector has great opportunities with respect to getting genetic resources,

Experience of locally built extraction machines: Currently there are at least nine different size distillation units being constructed by local industries. Example: Ambo Engineering PLC and Selam Technical and Vocational College are the two important engineering units having good experience of making aromatic distillation units. Green way PLC has also trying to construct local tray drier for drying of aromatic and herbs leaf before exporting the product to obtain optimum moisture content of the product.

ii. Demand of products by processing

Interests on aromatic plants growing and processing investment is increasing and expansion of integrated agro-processing industrial parks,

Capacity development can facilitate the marketing of aromatic plants value chain by creating a link between buyers and farmers,

The existence of advantageous government policies and strong government commitment which supports small scale businesses was another opportunity for farmers.

iii. Domestic consumption demand

The development of international hotels and the increase of awareness of aromatherapy, an increase of the demand of natural products, intensified urbanization and population growth, higher demand due to due to corona virus pandemic and other health care system.

iv. Processing potential demand

Huge potential market for quality and sustainable aromatic plants, and its derivatives in international markets. Locally large number of high standard hotels is being opened in various parts of the country with various services like spa and massaging. In addition, cosmetic industries, soap factories and detergent making companies are many. Medicinal factories are also found in good numbers. Aromatic plants being ingredient of many products of these hotels and factories have high local potential, thereby substituting the current imports.

4.6.2 Challenges against pro-growth

Contrarily existing immense opportunities there are several challenges which triggering development of the sector. Thus, the various constraints of the aromatic plants value chain, influencing its development have been identified from desktop review, survey, focus group discussion and key interview, and described as follows:

The supply market at the different stages expected to be effective and availability, quality, cost and delivering time affect the performance of the supply market. The supply of inputs, intermediary or semi-finished and finished products across aromatic plants value chain ensures the linkage strength and improves the efficiency of the value chain.

Input related constraints: The growing of the aromatic plants needs the supply of several inputs. The major inputs include improved seed varieties, seed multiplication facilities, modern growing technologies, land provision and finance. In addition, the skilled labor force and expertise support are essentially important in the effective and efficient farming process at the initial value addition major activity in the value chain. However, there are constraints identified in acquiring the farming inputs at the desired level of quantity, quality, time and place, which affect the productivity and production volume of the produces. The following are major constraints in input supply.

Inadequate availability and use of improved seeds varieties (both in terms of quantity and quality, limited seed multiplication to processors and exporters, low improved farming technologies support service, limited credit availability and access, and collateral problem for accessing loans.

i. Production technology constraints

The major challenges in production of aromatic plants/herbs produce are associated with the activities in the course of farming process which comprises seed quality or seedling selection, multiplication, farm land preparation, sowing, tending operations and harvesting. Modern and standard agronomical practices and research supported plantation and harvesting are imperative in increasing volume and yield of the produce. In this regard, the major constraints identified are:

Inadequate skill and knowledge in growing the plants while adopting modern technologies, availability of high quality seed and its market, poor extension service in the production of aromatic plants or herbs, strong linkage with universities and research institutions, the right facility particularly for drying, packaging and transporting, post-harvest knowledge, land fragmentation and lack of good practices lead to high production prices and enhancing productivity potential due to limited use of improved inputs, small fragmented plots, marginal soils, limited use of improved varieties, loss of genetic diversity due to severe impacts of climate change.,

ii. Marketing quality constraints

Inadequate infrastructure: poor market linkage such as road (feeder roads are impassable and do not link farms to markets)

Due to lack of global market quality standards, producers and processors are selling their products (regardless of quality variation) on similar values. The price for poor quality and good quality products is almost the same on the market place. Consumers and users are, on the other hand, complaining on the values and quality of the products supplied by farmers and processors as there is no product grade (based on standards) and a corresponding reasonable price attached.

iii. Market competitiveness

The tendency to use herbal medicines increases from time to time due to need of health improvements. There is a forecasted 9% growth in aromatic plants and spices demand globally. This opportunity should be exploited by identifying the challenges in entering into the export market. The major challenges which affect the global competitiveness of aromatic plants of the country are identified from the actors and documents reviewed enlisted as hereunder:

iv. Processing business Technologies

The processing companies of aromatic plants have challenges related to input acquisitions, processing technologies, financial availability and method of processing among others.

Low capacity utilization, poor Market integration Limited raw material supply: poor quality and low supply are considered the major constraints in extracting aromatic plants. This might be due to low productivity and unable to meet the demand of rising number of processors. Weak linkage among value chain actors. Due to the weak vertical and horizontal linkages, there is an information gap between lead-firms and producers on g aromatic plants quality amount supply in a year Limited use and availability of modern processing technology. Lack of awareness for transporting packed essential oil. ESLSE (The Ethiopian Shipping and Logistics Service Enterprise) doesn't know the nature of the

product. Sometimes they say it may be hazardous liquid, so it created burden for the exporter. Besides, the product store at 8 oC while transporting, but they didn't maintain that temperature

Challenges of certification of brands there are no national quality standard systems developed on aromatic plants/herbs, lack of traceability system practices, absence of knowledge transfer on standards by farmers and businessmen and most farmers use traditional value with minimum adding practices for export consumption.

4.6.3 Future outlooks enhancing business linkages along the value chain

The country has comparative advantage on the production and processing of natural plants for various products. The global demand of aromatic is increasing at 9% per capita consumption of herbal based cosmetics and beautify products is increasing dramatically.. Moreover, due to increased number of international hotels, population growth and preferences to natural products because of health concern, the local demand found to be also at an ever increasing rate.

This investigation clearly demonstrated in the previous section about the potential uses, growth of the aromatic plants value chain is in Ethiopia with immense potentials and simultaneously with clear challenges opened for future development of the sector. A holistic approach to addressing the entire value chain problem requires the integration of a broader group of stakeholders. This coordination and integration approach helps to ensure that the intervention plan is supported by all stakeholders and all those involved in the aromatic plants value chain take some responsibility for achieving success. Additionally, this provides a chance to coordinate efforts by numerous NGOs and research organizations aiming for similar objectives –communicating will ensure that lessons learned are shared, efforts are not duplicated and organizations are not re-inventing the wheel.

Globally, about 25 to 35 % of human medicine is said to coming from plant origins and similarly, the cosmetic industry from aromatic herbs is annually growing from 7 to 13 %. Majority of herbal plant species used for cosmetic industry in many nations are growing and cultivated in Ethiopia. Hence, capitalizing the existing system is essential, though the current scenario of production and marketing approaches are very scattered and fragmented. It requires major MAPs development by focusing the following aspects matching indicated purposes (Tab.11).

Table 11. Matrixes of intervention outlooks for future growth and development of MAPs aligning with homegrown economic development plan of Ethiopia in the next ten years

Development aspects	Main functions
Functional linkage system	MAPs system establishment, coordination, leading and government policy advices
Institutional setup and working priority agenda	Federal, regional, zonal, woreda and kebele level MAPs functional structure
Increase production efficiency	Quality seed sourcing, multiplication, availability, accesses, agritech and production system, irrigation, mechanization, processing and packaging
Innovative market channel	Existing and new market channels (locally and globally)
Communication	Effective communication with multiple partners, research, universities, development, associations, NGOs, Private and government sectors
Capacity building	,Effective policy, public-Private Partnership, Privare research organizations, Skills and infrastructures
Data management	National data hub, availability, access and quality
Commitment and leadership	Intensification of investment, commitment to promote at various leadership level

4.7 Conclusions and Recommendations

The detailed investigations of the value chain analysis of aromatics herbal plants focusing on utility for cosmetic industry asserted that there is a growing demand of aromatic plants and their extracts as functional ingredients in the pharmaceutical, food and cosmetic industries. The major reasons why these plants and their derivatives has increasing demand in the cosmetics industry are because they are natural, eco-friendly and generally recognized as safe products.

Ethiopia has a good comparative advantage in growing varieties of aromatic plants due to varied agro climatic conditions it is endowed. In addition, conducive environment for investment, expansion of integrated agro-processing industrial parks and organic output can make the country competitive in international market. The global annual growth rate of herbal based cosmetics and beauty products is found to be changing from year to year, though reports depicted to the account of 7 to 13%. Nevertheless, compared to other aromatic producing African countries, Ethiopia's current performance is low (1% share). Moreover, the local industries import over 50% of their raw material requirements mainly from India, Brazil, Israel, South Africa and Germany.

Owing to this, aromatic plants and their extracts can boost exports to improve foreign exchange earnings and allow for continued import substitutions. As a result, it is evident that the aromatic plants economic area can be a significant contributor to the economic and social development of Ethiopia. They have the potential to become new generation substances for human and animal nutrition, health and cosmetics industry.

However, from the stakeholder's discussion, the study team learned that both the aromatic/herbs and aromatic economic area are currently suffering from lack of attention by the government, high degree of fragmentation in market and production, poor quality, lack of market oriented production, limited consistent market, and lack of availability of inputs for aromatic extractors.

4.7.1 Recommendations

The aromatic plants and their derivatives area could be strengthened by enhanced on-farm productivity and developing a more efficient chain of inputs and off-take, driven by a strong, export sector with strong export players to ensure consistent international demand.

- i. The following technical points are recommended to improve the performance of the aromatic plants/herbs value chain:
 - Increase adoption of modern agronomic/agro forestry practices, enhancing the use of improved technologies, such as improved seed, expand and develop market through the application of different aromatic plants marketing strategies, Incorporate aromatic plants into extension systems and strengthen the linkage and vertical integration among the actors along the value chain.
 - Enhance traceability, international accreditation and certification, link smallholders with agribusiness enterprises through contract farming, enhance export promotion, local and international market intelligence and increase strong relationship between broad ranges of well-developed exporters to the international markets.

- Enhance the knowledge and skill of main actors, across value chain, in their areas of operational activities\ enhance the knowledge and skill of service providers, across value chain, in their areas of service delivery activities
 - Reduce bureaucracy and ensure transparency and value chain governance in delivering services by government offices, as an example the Drug Administration and Control Authority (DACA) of Ethiopia has a mandate to issue certificate of competency for essential oil production. Unfortunately, the organization has no enough information and knowledge about the sector. Thus, the officers or any concerned workers need continuous training so that the authority can support the development of the sector in Ethiopia.
- ii. The following regulatory and policy related recommendations are also given to improve the aromatic plants value chain sector:
- Currently input supply is distributed through biodiversity, which makes the process very lengthy. It is better to support the private sector by policy framework to engage in the distribution of improved seed and technology.
 - The government should have regulations and policy to avail sufficient land for nucleus farm on potential areas that aromatic plants can grow very well to increase the production and involvement of the private sector practice.
 - There shall be policy framework to make efficient and effective in put marketing system to insure access for market oriented aromatic plants species, organic fertilizer, and enough credit access or facilities.
 - There should be policy support to improve seed production and distribution systems by supporting the development of market oriented seed producing business models in the informal seed sector, such as out grower schemes, small-scale seed enterprises, seed producing cooperatives, etc.
 - Set up a continuous sectoral platform to mobilize actors for collective action in the aromatic, essential oils, and cosmetics sector to develop code of conduct for the sector to set ethical guidelines and contract procedures, and build trust by ensuring quality based pricing for the different products: aromatic, essential oils, and cosmetics.
 - There should be established regulations and frame works of government for conducting, knowledge and technology transfer, as well as research and development activities on the area of aromatic plants, essential oils in relation with cosmetics formulation.
 - Enhance knowledge and skill of actors in the sector by ensuring knowledge transfer in the
 - areas of contract farming, seedling, essential oil and cosmetics standards, improving processing technology, production costs and productivity, credit facilities, pre-and post-harvest technology, etc.
 - Establish a policy framework to encourage for the development of local essential oils extraction technologies in TVET, Universities and research institutes.
 - There should be special policy package for transport and shipping of essential oils, especially for export trade.

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Appendix
Appendix 1: List of Existing Ethiopian essential oil processing companies and annual production capacities (2021)

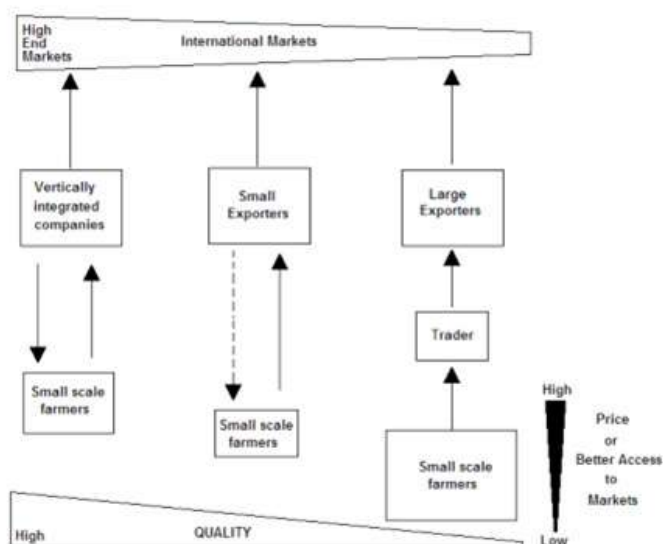
Sr.No	Name of the companies	Target aromatic plants	Annual Processing capacity (kg in fresh form)	Annual essential oil production capacity
1	Biruk and Tsegaw Manufacturing of Cosmetics, cleaning and Inputs partnership	Eucalyptus globules essential oil	50000 kg	1458525.00
2	Terra Plc	Damask	70000 kg leaf	1458525.00
3	Oromia Forest Enterprise	Eucalyptus globules oil	150000	1458525.00
4	Ethio AgriCeft	Citronella, palmarosa, mints, lemongrass, sweet marjoram	57960	1458525.00
5	DOCOMOS Oil Plc	Osyris wood	520000	1458525.00
6	Damascene Essential Oils Plc	Globules, rosemary, rose scented geranium, lavender, mints, citrus	163,957	1458525.00
7	Abysinia Essential Oils Plc	Peppermint, spearmint, lemon verbena, rose scented geranium, eucalyptus, palmarosa, citronella, lemongrass and chamomile	116,391	1458525.00
8	Cumin PLc	Globulus, rosemary, lemongrass, palmarosa, citrus	73,519	1458525.00
9	Arit Herbal	Lemongrass, mints, rose scented geranium, myrrh, Opoponax, black cumin, Frankincense, thyme	161,034	1458525.00
10	Tabor Essential oils PLc	Globules	95,664	1913
11	Total		1458525.00	49,480

Appendix 2: Bench-marking of Ethiopian Aromatic processing with India and Egypt for the Year 2018 (Economy Trend, 2021)

Parameters	Ethiopia	India	Egypt
Total export value of essential oil	1298 USD	859,623,137 USD	51,885,954 USD
Total Import Value of essential oil	284,406 USD	387,395,124 USD	14,535,798 USD
Total export value of aromatics/ herbs	2,892,358 USD	307,241,586 USD	111,340,372 USD
Total Import Value of aromatics/ herbs	76,681 USD	79,008,849 USD	11,898,238 USD
Processor's capacity utilization	Below 50%		
Value additions	Aromatic extraction and cosmetic formulation	Aromatic extraction, cosmetics and pharmaceutical formulation	Aromatic extraction, cosmetics formulation
Rosemary	33.62-64.76	20-55.55	-
Aromatic content for:			
Rosemary	0.46-0.75%	0.35-0.36%	0.54%
Rose	0.052-0.105%	0.1-0.21%	-
Oregano	0.37-0.79%	-	0.35-2.36%
Pepper mint	0.25-0.52%		0.3%

Appendix 2.1

The commercialization models farming and contract farming contributes a lot for Egyptian aromatics and essential oil sector. The majority of the farmers produce low quality previously, which are usually sold at low price to traders. The vertically integrated model enhances the quality of essential oil as well as strengthen the value chain linkage. In order to upgrade the industry at small scale farmer levels, farmers should improve quality and transparency. The production of clean and high quality products will enhance farmers' links to world markets by providing the farmers with higher prices or better access to farmers. Besides, the Egyptian have relatively well organized database for medicinal and aromatic plants from other African country



Egypt: developed vertically integrated farming model and quality relationship

Appendix 3. Diversity of plant varieties of Aromatic plants/herbs in Ethiopia

S r . No	Botanical Name	Common name	Family	Parts used	Purpose	Altitude	Growing area
1	<i>Mentha arvensis</i> L.	Japanese mint	Lamiaceae; Labiatae	Aerial	Essential oil, Food flavor, Medicinal	1200-2000	Sidama and Gojjam
2	<i>Mentha piperita</i> L.	Peppermint	Lamiaceae; Labiatae	Aerial	Essential oil, Food flavor	1200-2000	Sidama and Gojjam
3	<i>Mentha spicata</i> L.	Spearmint	Lamiaceae; Labiatae	Aerial	Essential oil, food flavor, medicinal	1200-2500	Shewa, Sidama, West Arsi
4	<i>Mentha logifolia</i> L.	Horsemint	Labiatae	Aerial	Essential oil, medicinal	1900-2400	Tigray, Gonder, Welo, Shewa, Ilubabor, Kefa
5	<i>Eucalyptus citrodora</i> Hook.	Lemon-scented	Myrtaceae	leaves	Essential oil, medicinal	1200-2000	Welo, Shewa, Harerge, West Arsi, Amhara
6	<i>Eucalyptus globules</i> Labil	Tasmanian blue-Gum	Myrtaceae	leaves	Essential oil, medicinal	1700-2800	Shewa, Gonder, Harerge, Arsi, Kefa
7	<i>Chrysopogon zezanoid</i>	Vetivar	Cyperaceae	Root	Essential oil	1200-2000	Sidama, Kefa, Gedio, Jimma
8	<i>Cymbopogon martinii</i> L.	Palmarosa	Gramineae	Aerial	Flavor, medicinal, essential oil	1500-3000	Sidama, Arsi, Gamo Gofa, Wello, Kefa, Ilubabor, Welega
9	<i>Cymbopogon citrates</i> (DC.) Stapf	Lemongrass	Gramineae	Aerial	Perfumery, medicinal, essential oil, insect repellent	1200-2000	Gonder, Gojam, Shewa, Sidamo, Gamo Gofa
11	<i>Pelargonium graveolence</i> L.	Geranium	Geraniaceae	Leaves, flowers	Essential oil, perfumery	1500-2400	Potential crop for mid highland to highland parts of the country
12	<i>Rosmarinus officinalis</i> L.	Rosemary	Labiatae	Leaves, flowers	Essential oil, food flavoring, medicinal	1600-2400	Shewa, Sidama, Ilubabor, Arsi, Welo,
13	<i>Lippia adoensis</i> Hochst. Ex Walp.	Basil	Verbenacea	Leaves	Medicinal, essential oil, flavour	1600-2650	Tigray, Sidama, Welo, Gojam, Welo Shewa, Harerge, Arsi, Gamo Gofa, Keffa, Welega
14	<i>Ocimum basilicum</i> L.	Basil	Labaitae	Leaves	Medicinal essential oil and food flavoiur	1500-2000	In all parts of the country within the altitudinal ranges
15	<i>Lavandula spicata</i>	Lavander	Labiatae	Aerial	Essential oil, medicinal	1400-2000	Shewa, Sidama,
16	<i>Ruta chalpenesis</i> L.	Rue	Rutaceae	Aerial	Medicinal, food flavor, essential oil	1500-2500	Throughout the highlands of Ethiopia
17	<i>Ocimum forskolei</i> Benth	Ajuban	Lamiaceae	Leaves and shoots	Essential oil	1000-2500	Tigray, Gondey, Wello, Welega, Shewa, Harerge, Kefa, Gamo gofa and Sidama
18	<i>Ocimum gratissimum</i>	African basil	Lamiaceae	Leaves and shoots	Essential oil	650-2100	Bale, Gonder, Gojam, Arsi
19	<i>Ocimum lamiifolium</i> Hochst.	Damakese	Lamiaceae	Leaves and shoots	Spice, essential oil, medicinal	1200-2900	Tigray, Gonder, Gojam, Welega, Shewa, Arsi, Harerge, Illubabor, Kefa, Gamo gofa, Sidama

S r . No	Botanical Name	Common name	Family	Parts used	Purpose	Altitude	Growing area
20	<i>Jasminium grandifloriundrum</i>	Jasmine	Oleaceae	Flower	Essential oil, perfumery	1800-2000	Sidama
21	<i>Aloysia tripholia</i> (L'Herit) Britton	Lemon verbena	Verbenaceae	Leaves	Spice, food flavoring, essential oil	1700-2700	Welo, Shewa, Bale, Harerge, Sidama
22	<i>Thymus vulgaris</i> L.	Thyme	Labiatae	Aerial	F l a v o r , essential oil, medicinal	1800-3700	Bale, Debrebrihan mountains
23	<i>Artemisia annua</i> L.	Chinese wormwood	Asteraceae	Aerial	Essential oil, medicinal	1500-3300	Gamo Gofa, Sidama, Shewa
24	<i>Artemisisa absinthium</i> L.	Wormwood	Asteraceae	Aerial	Essential oil, medicinal	1700-2500	Tigry, Gonder, Shewa, Sidama, Gamo Gofa
25	<i>Feoniculum vulgare</i> L.	Fennel	Apiaceae	Aerial	F l a v o r , medicinal, Essential oil	1525-2800	Gonder, Gojam, Welega, Shewa, Arsi, Harerge, Kefa
26	<i>Anethum graveolens</i> L.	Dill	Apiaceae	Aerial	Spice, food flavoring, essential oil	1525-2800	Gonder, Gojam, Welega, Shewa,
27	<i>Artemisia abyssinica</i> Sch. Bip ex A. Rich	Artemisia	Asteracea	leaves	Medicinal, flavor	1800-3500	Tigry, Gonder, Gojam, Wello, Shewa, Welega, Ilubabor, Bale, Harerge
28	<i>Artemisia afra</i> Jacq. ex Willd	Artemisia	Astraceae	leaves	Medicinal, essential oil	3050-3600	Arsi, Bale, Sidama
29	<i>Echnops kebericho</i> Mesfin	Kebericho	Astraceae	Roots	Medicinal, essential oil	1700-2900	Gojam, Shewa, Welega (Endemic to Ethiopia)
30	<i>Boswellia microphylla</i> Chiov.	Boswellia	Burseraceae	Resin and bark	T a n n i n g , essential oil	400-1300	Sidama, Bale, Somalia, Harerge
31	<i>Boswellia neglecta</i> S. Moore	Boswellia	Burseraceae	Resin	A r o m a t i c properties	600-1750	Gamo Gofa, Sidama, Bale, Somalia, Harerge
32	<i>Commiphora myrrha</i> (Nees)	Myrrh	Burseraceae	Resin	Incense	250-1300	Tigry, Wello, Harerge, Bale,
33	<i>Boswellia papyrifera</i> (Del.) Hochst	Frankincense tree	Burseraceae	Resin and bark	Essential oil	950-1800	Tigry, Gonder, Gojam, Shewa
34	<i>Tavernaria abysinica</i> A. Rich	Dingetegna	Leguminosae	Root	Medicinal essential oil	1700-2300	Shewa, Tigry, Welo
35	<i>Hibiscus sabdarifa</i> L.	Roselle	Malvaceae	Seeds, fruits	Medicinal essential oil	1350-2000	Sidama, Gojam
35	<i>Hagenia abysinica</i> (Bruce)	African Red	Rosaceae	Leaves,	Medicinal essential oil	1800-3200	Bale, Arsi, Hararghe, Ilubabor,
37	<i>Artemisia rehan</i>	Artemisia	Asteraceae	Leaves	Medicinal and essential oil	1500-2500	Throughout the highlands of Ethiopia
38	<i>Ocimum basilicum</i>	Basil (Adjuban)	L a m i a c e a e Landraces	Leaves	Essential oil, Medicinal and spices	1500-4000	Throughout the High lands & mid altitudes of Ethiopia

S r. No	Botanical Name	Common name	Family	Parts used	Purpose	Altitude	Growing area
39	Ocimum basilicum var Thgrstifolium	Basil	L a m i a c e a e Landraces	Leaves	Medicinal, essential oil	1700-2900	Gojam, Shewa, Welega (Endemic to Ethiopia)
40	Ocimum graveolens L. A. Braun	Basil	L a m i a c e a e Landraces	Leaves	Medicinal	above 2000	Gojam, Shewa, Welega (Endemic to Ethiopia)
41	Matricaria chamomilla	Camomile	Asteraceae	Aerial	Essential oil	100-1700	Throughout the High lands & mid altitudes of Ethiopia
42	Cymbopogon wintereanus	Citronella grass	Poaceae	Aerial	Essential oil	1700-2800	Shewa, Gonder, Harerge and Kefa
43	Embelia schimperi	Enkoko	Myrsinaceae Landraces	Aerial	Essential oil	1700-2500	Gonder, Gojam, Shewa, Sidamo and Gamo gofa
44	Echinops kebericho	Kebericho	Asteraceae	Root	Essential oil	-	High lands & mid altitudes of the country
45	Hygenia abyssinica	African redwood (Koso)	R o s a c e a e Landraces	Aerial	Essential oil	-	High lands & mid altitudes of the country
46	Lavandula officinalis	Lavander	Lamiaceae	Aerial	Medicine, Flavour and Essential oil	1500–2000	High lands & mid altitudes of the country
47	Eucalyptus globules	Blue Gum (Nech- bahir zaf)	Myrtaceae	Leaves	Medicinal	0-1000	Afar, Somalia
48	Cymbopogon martiinni	Palmarosa	Poaceae	Aerial	Medicinal, essential oil	1500-2500	Throughout the highlands of Ethiopia
49	Chrysanthemum cinerariaefolium	Pyrethrum	A s t e r a c e a e (Workyie)	Aerial	Medicinal, essential oil	1700-2150	Shewa and Tigray
50	Chrysanthemum cinerariaefolium	Pyrethrum	A s t e r a c e a e (Bekoji)	Aerial	Medicinal, essential oil	2250-3750	Tigray, Gojam, Gonder, Welo, Shewa, Arsi, Bale, Harerge, and Sidamo
51	Ruta vulgaris	Rue	R u t a c e a e ; Landraces	Aerial	Incense	250-1300	Tigry, Wello, Harerge, Bale,
52	Senna alexanderiana L.	Senna	Fabaceae	Fruit, pod, seed, leaves	Essential oil	950-1800	Tigry, Gonder, Gojam, Shewa
53	Artemisia annua	Sweet annie	Asteraceae	Leaves	Medicinal essential oil	1700-2300	Shewa, Tigry, Welo
54	Taverniera abyssinica	Taverniera	F a b a c e a e (Wendo)	Landraces	Medicinal essential oil	1350-2000	Sidama, Gojam
55	Thymus schimperi Ronniger	Thyme	Lamiaceae	Flower, Leaves	Medicinal essential oil	1800-3200	Bale, Arsi, Hararghe, Ilubabor,

S r. No	Botanical Name	Common name	Family	Parts used	Purpose	Altitude	Growing area
56	<i>Anthemis tigreensis</i> J. Gay ex A. Rich	Embah	Asteraceae	Aerial	Essential oil, medicinal	100-4620	Tigray, Gojam, Gonder, Welo, Shewa, Arsi, Bale
57	<i>Ajuga integrifolia</i>	Zibute-kurijun (Me) Amaro (Am)	Lamiaceae	leaf and Root	Medicinal, essential oil	1500-3460	Tigray, Gojam, Gonder, Shewa, Hararge, Bale, Sidama
58	<i>Becium grandflorum</i>	Dabab, Tafibaba	Lamiaceae	leaf and flower	Medicinal, essential oil	1600-3100	Tigray, Gojam, Gonder, welo, Shewa, Sidama, Gamo gofa and Welega
59	<i>Mentha pulegium</i> L.	pennyroyal	Lamiaceae	Flower	Medicinal, essential oil	In wet and flatter area	Tigray
60	<i>Mentha aquatica</i> L	Water mint	Lamiaceae	Leaf	Medicinal essential oil	1800-2000	Shewa
61	<i>Ocimum americanum</i> L	Lemon Basil	Lamiaceae	Aerial	Essential oil	570-2400	Tigray, Gonder, Gojam, Shewa, Ilubabur, Kefa, Gamo gofa, Arsi, Harerge and Sidamo

Source: Solomon Abate and Beemnet Mengesha. (2013); Nigist and Sebsibie (2009); Girma Hailemichael., Solomon Abate and Ali Mohamed. (2012)

Chapter Five:

Value Chain Study on Natural Extracts and/or Essential Oils for Pharmaceutical Ingredients



Executive Summary

The value of medicinal plants for medical and pharmaceutical purposes is due to their secondary metabolites such as essential oils. Essential oils extracted from different medicinal and aromatic plants have been studied for more than 60 years and numerous efforts are made to explore the usage of essential oils. Currently, there is a growing interest in natural plant extracts or essential oils and hence, there is a desire to rediscovery of natural remedies values and health benefits'. To this end, Addis Ababa Chamber of Commerce and Sectorial Association (AACCSA) took the initiatives for conducting this Value Chain Study on natural plant extracts or essential oils.

The overall objective of the study has been to conduct the value chain analysis of natural extracts and/or essential oils for Pharmaceutical Ingredients for better understanding of the agriculture of aromatic plants, and processing of essential oils as a basis for investments. Standard and scientific methods for data gathering and data analysis process was used during the study. Data collection methods and tools used in this study included extensive document analysis, interviews of resource persons, focus group discussions with various relevant organizations' experts and distribution of questionnaire to purposely-selected essential oils value chain actors. A mixed analysis approach has been employed to come up with the study results.

In this value chain study, the essential oils economic importance, production, consumption, import and export trends were analyzed. In addition, the value chain and the market flow of the commodity was mapped, operational actors in the value chain and their functional roles were discussed. Accordingly, opportunities and challenges across the value chain have been identified and possible intervention mechanisms are proposed. Finally, conclusions and recommendations are given to the concerned stakeholders.

As a general fact, plant natural oils or essential oils has significant contribution to the national economy in different ways. This because, it is a livelihood for some households, creates employment opportunities/generates income, source of food, medicine, and cosmetics ingredients, and also generates foreign currency earnings, etc. Moreover, essential oils used mainly as drugs and/or drug ingredients in the pharmaceutical industries.

Ethiopia has a wide range of ecological biodiversity, and accustomed traditionally to use plant medicines. In spite of endowment with such traditional knowledge, and ecologically blessing to grow various medicinal and aromatic plants, the country is not still properly benefited from this sector as it is constrained by different factors.

The findings of this study revealed that essential oil production from major aromatic plants in Ethiopia was projected to be 234,700 Kg in 2026, which is very small compared to the imported amount and that of other African countries production. Compared to other essential oil producing African countries, Ethiopia contributes less than 1%. The major producers of essential oil in Africa are Madagascar (26.22%), Egypt (22.49%), South Africa (19.14%), Morocco (11.94%), Tunisia (8.52%), Kenya (4.99%), Comoros (1.77%), and Eswatini (0.84%) . Nearly half (48.71%) of the contribution from the continent is from Madagascar and Egypt.

Domestic consumption demand for essential oils increases progressively due to high demand for plant/natural products, the shift of consumers' perception to become increasingly diet conscious on herbal nutritional supplements, increased production of herbal healthcare formulations and herbal based

pharmaceutical products. In Ethiopia, there are a few processing companies extracting essential oils for export.

The overall export earnings of Ethiopia from essential oils seems low. Ethiopia's essential oils export earning is estimated as 1501 thousand (USD) in 2020, and on average the country exported 62095kg of different varieties of essential oils from the year 2012-2020 with export value of 2,974,322 (USD). However, the overall import of essential oils to Ethiopia was 73,000kg in 2020 and expenditure was 649,000 (USD) in the same year with average imported volume of 638,870 kg from 2012-2020 with the total expense of 6,643,667 (USD), that incurred a huge burden foreign currency on the country. The top export destinations of essential oils from Ethiopia in 2020 were India, Germany, China, France and Japan. However, India took a lion share of 87.7% (1317 thousand US\$). The main trading partners for import of essential oils to Ethiopia in 2020 were Netherland, China, France, Spain and India with a share of 59 %, 19.3%, 7.2%, 6.5% and 6%, respectively. Commonly imported essential oils and/or essential oil rich materials included lemon oils, pepper mints, oleoresin, other aromatics oils (like lavender, rosemary, sage etc...), other citrus fruit oils (other than bergamot, orange and lemon), orange oils and resinoids. Ethiopia imported 6998kg orange, 104845kg lemon, 21735kg other citrus, 60251kg pepper mint, 36537kg other aromatics, 5250kg resinoids and 48787 kg, , , extracted oleoresins oils by the year 2018.

The value chain of essential oils plants is an array of processes starting from planting or sowing of the plants to use to consumption of essential oils. The core processes identified across the value chain include cultivation/production of the essential oil plants, collection of the fresh or dried plants/herbs, processing or oil extraction, marketing of processed products and consumption. The existing value adding processes were mapped in their logical sequence, examined and limitations were identified to improve the efficiency through appropriate intervention at various levels along the value chain. For the value chain to function properly, several actors are involved along the essential oils value chain including producers, local collectors, primary cooperatives, processors/exporters and consumers. The chain supporters (Development Agents, Bureau of Agriculture, Agricultural Research Center and NGOs) are also important in delivering technical advice, service provision, policy formulation and implementation of the chain. The role and function of each value chain actor has been discussed briefly.

The study has also identified challenges in the production, processing and marketing of aromatic plants/herbs/essential oils. The main limitations identified were lack of know-how of the small-holder farmers on the proper utilization of the essential oils, unavailability of attractive market for the products, and lack of systematic approach in popularizing the essential oils, its value on pharmaceutical applications and in various products. Thus, there is a need for training on the production, processing /extraction, commercialization and utilization, and market potential of selected commodity.

The holistic approach to address the entire value chain problem requires interaction of a broader group of stakeholders. This coordination and integration approach helps to ensure that the intervention plan is supported by all stakeholders and all those involved in the value chain take some responsibility for achieving success.

Having known the challenges, possible interventions were proposed and the interventions are expected to be responsibly implemented at different level of the value chain by the various actors along the value chain. Improving the production technology packages, supplying improved seed varieties, creating collateral possibilities, contract farming and strengthening services are to be done at the backward linkages of the value chain.

On the basis of the proposed interventions by the government as well as other concerned stakeholders; the recommendations are forwarded to be considered by all concerned body in future program design, implementation and policy interventions in the short-, medium- and long-term period.

So as to exploit the opportunity of the current growing demand for natural or essential oil products, meaningful development programs and approaches, advocacy platforms, which bring the attention of all stakeholders are very fundamental, so that the country can benefit from the economy. However, currently the sub-sector is suffering from lack of attention, high degree of fragmentation in market and production, poor quality, lack of market-oriented production and limited consistent market. The essential oil extractors face shortage of consistent quality inputs. As a result, the current industrial demand for essential oils and/or extracts in Ethiopia is met through imports, and this brings burden on the country's foreign exchange.

5.1 Background

Medicinal and aromatic plants are extensively used as source of natural organic compounds and as medicines. They are widely distributed in different parts of the world. They got importance because local people use them for the treatment of diseases as well as condiments/spices due to their secondary metabolites such as essential oils. Essential oils are extracted mainly from different aromatic plants, and numerous efforts are made to explore the essential oils usage for the treatment of various diseases and as ingredients in pharmaceutical/non-pharmaceutical products. They are produced in different parts of plants including leaves, seeds, buds, stem, flowers and rinds of fruits. Essential oils are accumulated in the epidermis cells, cavities, secretary cells, and channels of the plants. Essential oils can be extracted from dried, fresh, or partially dehydrated materials of plants (Irshad, Subhani, Ali, & Hussain, 2019).

Essential oils are known for millennia and in the prehistoric times, they were used for medicinal and ritual purposes. They have been studied for more than 60 years. There is growing interest in the recent decades due to a desire for a rediscovery of natural remedies. Essential oils are extracted from plant raw materials using a variety of methods that are refined over the centuries and, the choice of an extraction method is decisive as it determines the type, quantity, quality and stereo-chemical structure of the essential oil components. To these components belong all properties that make essential oils so interesting for pharmaceutical uses (Cimino et al., 2021).

The major cultivators and producers of essential oils (EOs) that produce more than 70,000 tons per annum are USA, Brazil, India and China. Similarly, Australia, Malaysia, Indonesia, Thailand, Sri Lanka, South Africa, Egypt, France, Spain, Italy, Germany, Russia, Nepal, Bangladesh and Pakistan are also important contributors in worldwide production of EOs. Different types of EOs are produced in different parts of the world. For example, vetiver/khus, clove, lemon grass, basil and celery oils are mainly produced in India; Spain and France are major producers of Rosemary; tea tree oil from Australia and South Wales, and lavender from Europe. It is not surprising that these countries also represent the main market for the particular EOs.

Approximately 300 EOs are considered important from the commercial point of view. Essential oils with the highest production and market value worldwide include orange oil (*C. sinensis*), corn mint (*Mentha arvensis*), peppermint (*Mentha sp.*), eucalyptus (*E. globulus*), citronella (*Cymbopogon sp.*), lemon (*C. limon*), clove (*S. aromaticum*) and camphor (*C. camphora*). Moreover, basil, clary sage, lavender, sage, thyme, tarragon, chamomile, wormwood, coriander, fennel, dill, celery, anise, ajowan and cumin oils are also commercially important essential oils/sources. The market value of these oils may vary depending on the source material, purity, composition and many more factors. Many of these plants have potential to be used in pharmaceutical industry and the sources can also be grown in Ethiopia (Raut & Karuppayil, 2014).

Essential oils have been an important part of the pharmaceutical industry throughout the twentieth century. Their use as aromatherapy products, traditional medicines and in complementary systems of medicines is consistently increasing in the USA, Europe, Africa and in Asian countries.

In spite of endowment with diverse traditional knowledge, and ecologically blessing to grow various medicinal and aromatic plants, Ethiopia is not properly benefited from this sector. In Ethiopia, growing of aromatic plants and extraction of essential oils has been started some 47 years ago. However, the total amount of land allocated for the purpose did not exceed 50 hectares since then; 45 hectares at Wondo Genet, of which 40 hectares were dominated by *Eucalyptus citrodora*, and some 5 hectares on the hands of different private investors (Abate & Mengesha, 2011).

Successful commercialization of these important resources in Ethiopia requires clear understanding of the demand and production systems of the medicinal/aromatic plants and/or their derivative products, as well as, market information assessment or value chain analysis. A value chain includes the full range of activities that are required to bring a product from its origin, through different phases of production, and to its final customer. The activities in the value chain include research, production, transportation/distribution, processing and trading, warehousing/ storage activities geared towards meeting consumer needs and preferences. Value chains hold a critical role in the sustainable commercialization and integration of medicinal plants especially the wildings. Value chains can be used to account for power and dominance relationships between different actors, such as, producers, retailers, middlemen and associated differences in income accruing to them, the characteristics of the final product, as well as, the competitive advantage of the product over similar products. It is very known that value chains are critical to sustainable exploitation of medicinal plant resources and their natural extracts (EOs). Medicinal plants value chain is among the highly inequitable and unregulated, hence they tend to be inefficient.

Understanding the challenges and opportunities of each link in the chain (i.e., production, trading, processing and value addition, and marketing) and providing adequate information to the value chain stakeholders could be key to improve the contribution of essential oils value chain in the pharmaceutical industry.

In view of this, Addis Ababa Chamber of Commerce and Sectoral Association (AACCSA) has commissioned BAMHA consulting service P.L.C to undertake the Value Chain Study on aromatic plants /herbs production, processing and marketing in Ethiopia.

5.2 Objective of the value chain analysis

The overall objective of the assignment is “to carry out a Value Chain study on natural extracts or Essential Oils for Pharmaceutical Ingredients, to map out key actors and support providers, to identify constraints and opportunities and to develop an intervention plan”. More specific objectives of the assignment are:

- To map out all value chain actors and their functions, including service providers for value chains of the selected commodity.
- To identify opportunities and constraints of selected value chains.
- To analyze the local market structure and enabling environment affecting the value chain development and provide recommendations for its improvement.

5.3 Scope of the work

The scope of the envisaged value chain was reviewing and mapping the given value chain, identifying weakness for support at the product, processing, technological, institutional, legal, regulatory, and policy, market, and final consumption levels. The scope also includes assessing opportunities, and recommending specific areas with in the value chain having potential benefits for producers and actors with in the chain and beyond.

5.4 Methodology

5.4.1 Data Sources

Both secondary and primary sources of data were used in this study. Standard and scientific methods were employed for data gathering and data analysis. The major data collection methods and tools included extensive document analysis (Published and unpublished previous and ongoing study documents), in-depth interviews of resource persons, and selected focus group discussions with various organizations experts. The secondary data sources were collected from various internal and external organizations including Central Statistics Agency, Ministry of Agriculture, Ministry of Finance and Economic Development, related academic institutions Ethiopian Agricultural Research Institute, Ethiopian Ministry of Revenue, Ethiopian Custom Commission, Ministry of Trade and Industry, ECX, ITC, TRADE MAP, COMTRADE, International organization Data Base, FAOSTAT, EPOSPEA, and other relevant sources. The statistical data gathered was used for the foundation of the sector diagnosis. Such documents are useful for providing a more in-depth understanding of what is currently happening in the subsector.

5.4.2 Data collection tools and sampling

To collect primary data, purposive multi-stage cluster sampling technique was employed. The data collection techniques employed were questionnaires, interviews, focus group discussions, key informant interviews and observations. The primary data was collected using a small sample-based study, rather than a large-scale survey because of short study time and limited resources. Accordingly, target company managers and experts in the area were interviewed for in-depth understanding and analysis of the subsector. Similarly, officials and experts from relevant government organizations, associations, and researchers who have demonstrated interest in the subsector were interviewed.

In addition to individual interviews, focus group discussions were also conducted to explore concepts, generate ideas, determine differences in opinion between stakeholder groups who were engaged in similar activities and triangulate with other data collection methods. The group discussion was made using limited number of individuals consisting of 3-4 persons due to the current situation. The group discussion was guided with prepared checklist to capture the social interaction and spontaneous processes that inform decision making, which is often lost in structured interviews.

5.4.3 Data management and analysis

The collected data were analyzed both quantitatively and qualitatively.

Quantitative analysis of the sector was conducted to provide a picture of the current situation in terms of the distribution, value-addition, profitability, productivity, production capacity and marketing. Analyzing these factors highlighted the potential inefficiencies in the subsector.

Information collected through key informant interviews, rapid observation and focus group discussions (FGDs) were qualitatively analyzed. Qualitative content analysis and thematic analysis was used for interpreting the qualitative data collected from FGD, interview and key informants. The content analysis was used to evaluate patterns within a piece of content or across multiple pieces of content or sources of communication. Thematic analysis looks at patterns of meaning in a data set - for example, a set of interviews or focus group transcripts i.e., thematic analysis takes bodies of data and groups them according to similarities.

5.5 Major Discussions and Results

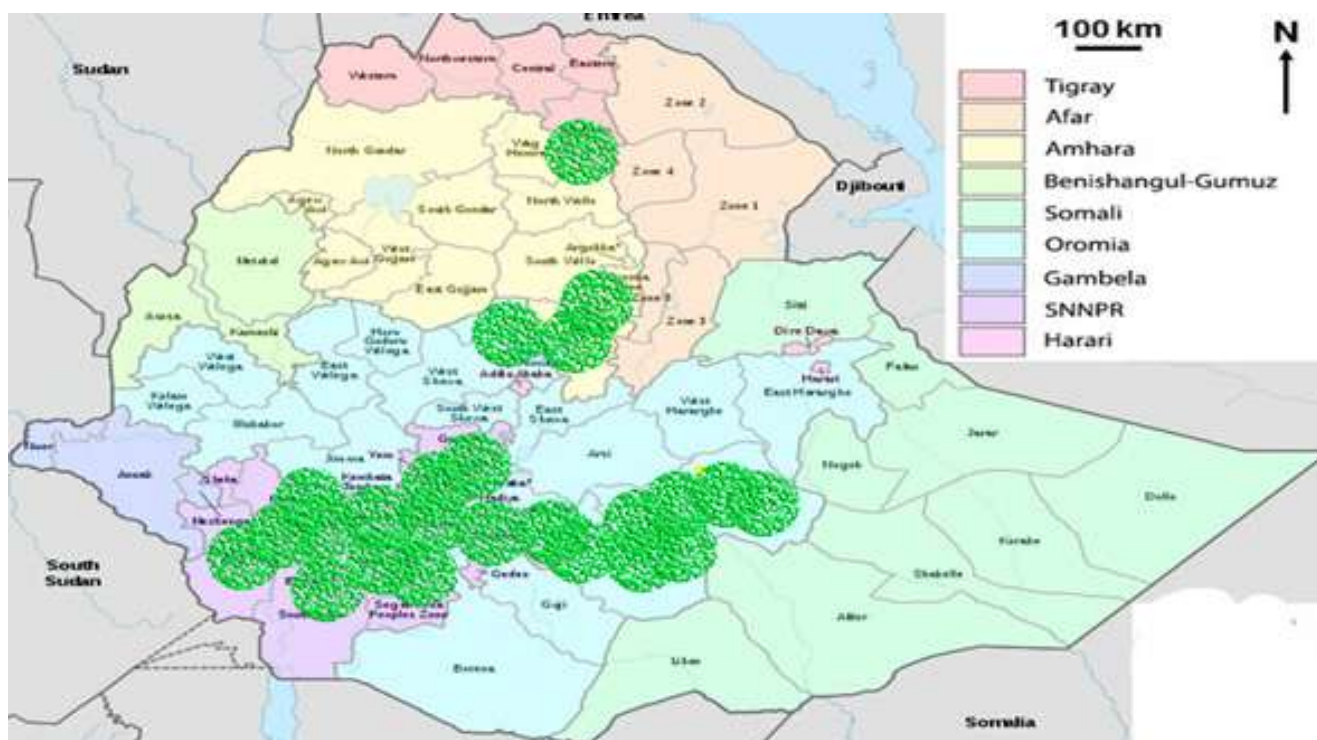
5.5.1 Economic Importance of the Natural Oils and/or Essential Oils for Pharmaceutical Ingredients in Ethiopia

i. Potential Areas and Significance

Essential oils are characterized as an aromatic substance produced from aromatic plants, which are having the original aroma of the odoriferous plants named essential oils (Beement, 2015). Essential oils are responsible for the aroma and flavor associated with herbs, spices, and perfumes. Several plants contain essential oils; however, parts of plants which serve as the major source of essential oil, can be flowers and inflorescences (e.g., chamomile, lavender, rose, ylang-ylang), leaves (e.g., basil, laurel, lemongrass, peppermint, rosemary), fruits (black pepper, nutmeg), peels (orange, bergamot, lemon, tangerine), seeds (anise, cumin, cardamom, fennel), berries (allspice, juniper), bark (cinnamon, cassia, sassafras), wood (cedarwood, camphor, sandalwood), root and rhizomes (ginger, vetiver, turmeric), and resins (myrrh, frankincense) (Sharmeen et al, 2021).

As the information obtained from experts in the area, all areas in the country can be considered as the potential area for production of essential oil-bearing plants. However, to give priority, the most potential aromatic plants growing areas in the country are encircled by green in the map (Figure 1). These are Debre-birhan, Batu/Ziway, Bale, Feche, Korem, WondoGenet, Arbaminch, Goffa, Siltie and the likec.

Figure 1: Ethiopian potential areas for essential oil-bearing plant production



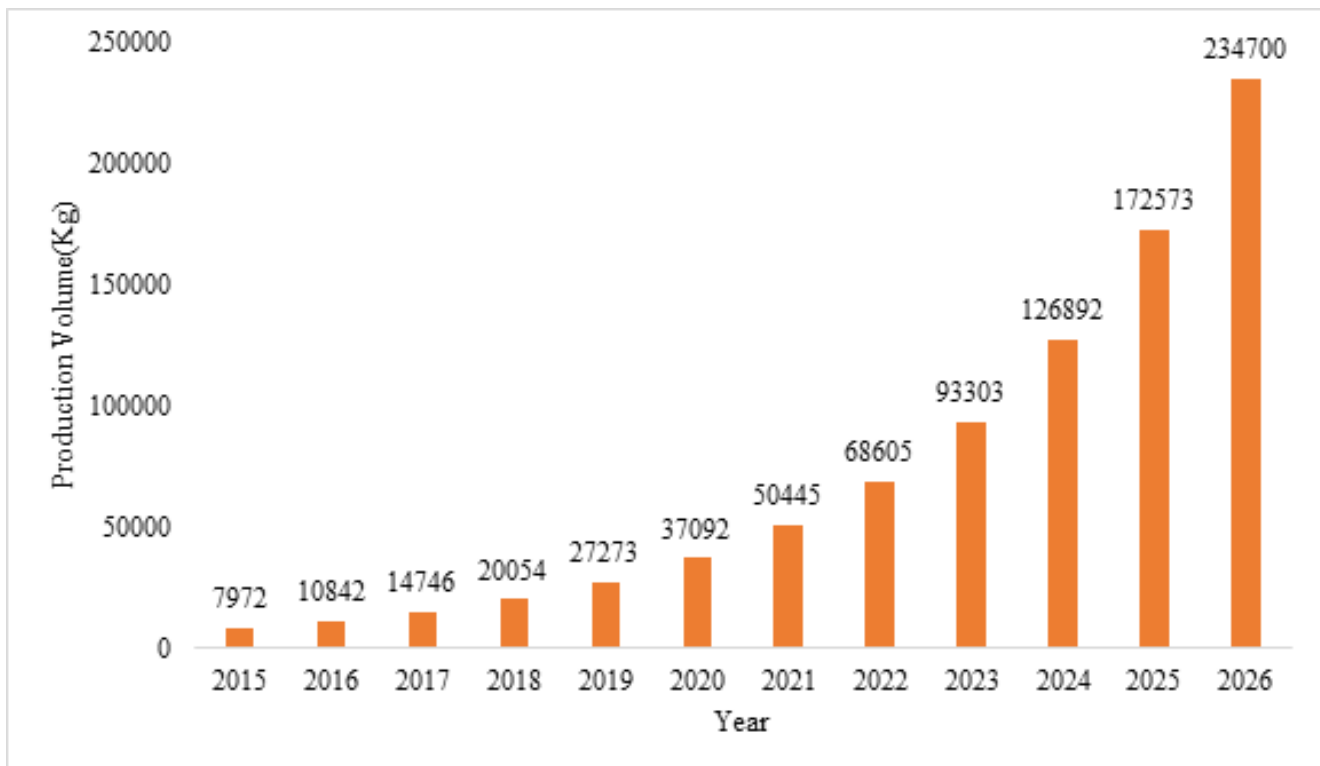
Furthermore, the experts also prioritized the potential growing essential oil bearing plants as

Eucalyptus globules, rosemary, lemongrass, chamomile, and lavender as exotic plants whereas, endemic (indigenous) plants which has potential to bring new brand and that might be the new market entrants are Thyme schimperi, Aloe birhana, Frankincenses (Bosolia), Myrrh (Commiphora spp), Artemisia afra (ariti), Lipia spp (Kosseret), Ocimum lamiifolium Hochst(Damakese), and Echinops(kebericho).

Aromatic/herbal plants and their extracts such as natural oils or essential oils, in general has significant contribution to the national economy in different ways. It is livelihood for some households, creates employment opportunities/ generates income, source of food, medicine, cosmetics, input for processors, and foreign currency earnings, etc. Aromatics/herbs/ plants and extracts can be used in spices, food flavoring industries, cosmetic industries, different herbal preparations, pharmaceutical industries, massage and steam bath, soft drinks, and alcoholic beverages (Beemnet, 2015). Herbs/ medicinal plants have been found as important contributors to the pharmaceutical, agriculture and food industries. Furthermore, essential oils are also used in the food industry for flavoring or flavor enhancing and in the aromatic industry directly in flavor and fragrance applications and formulated into a wide range of personal care and industrial products (Ramu et al, 2013).

Annual production of essential oils is recorded quantitatively by ENTAG only at 2017 from the year 2010 to 2014 G.C that has shown the national essential oil production trends. However, the research team used projection method to demonstrate the current trend of annual production of essential oils based on the data obtained from 2010-2014 (Figure 2). Accordingly, the projected trend shows that the essential oils production on major aromatic plants in Ethiopia is 68605, 93303, 126892, 172573, and 234700 kg, for the year 2022, 2023, 2024, 2025, and 2026, respectively. Also, Shayashone (2020) mentioned that the country can produce around 3 MT essential oils, mainly from Eucalyptus, Lemongrass, and Rosemary.

Figure 19: Projected essential oil production on major aromatic plants in Ethiopia (kg) (2015-2026 G.C), based on essential oil production from 2010-2014 G.C (ENTAG, 2017).



ii. Existing and Established Processing Plants

The local industries are highly import dependent with products such as essential oils, perfume materials, toilet & cleaning preparations, imported from South Africa, Brazil, Israel, Germany, etc.

There are a few processing companies that extract essential oil from herbs, most of which is for domestic consumption. The finding of this study revealed that being located in a suitable production area with good infrastructure, such as electricity and roads is crucial for the essential oils processing companies. Among the few essential oils/herbs processing companies in Ethiopia (Table 1), Terra PLC, a private company located in Debre Birhan town, processes essential oils from peppermint and thyme for the local market, and Rosa damascena for export to Germany. Moreover, Terra is also producing a small quantity of chamomile and dries it for the local market. Terra also grows herbs on 36 hectares of land and currently extracts and exports only six liters of Rosa damascena per annum, though it has the capacity to process over 40 kg of inputs per hour.

Table 3: List of existing Ethiopian essential oils processing companies and annual production capacities (2021).

Sr. No	Name company	Target aromatic plant/s/essential oils	Annual Processing capacity (kg in fresh form)	Annual essential oils production capacity (in liter)
1	Biruk and Tsegaw Manufacturing of Cosmetics, Cleaning and Inputs Partnership	Eucalyptus globules	50000	600
2	Terra PLC	Rose	105,000	30
3	Oromia Forest Enterprise	Eucalyptus globules	150000	3000
4	Ethio AgriCeft	Citronella, palmarosa, mints, lemongrass, sweet marjoram	57960	840
5	DOCOMOS Oil PLC	Osyris wood	520000	36400
6	Damascene Essential Oils PLC	Globules, rosemary, rose scented geranium, lavender, mints, citrus	92,550.00*	696*
7	Abysinia Essential Oils PLC	Peppermint, spearmint, lemon verbena, rose scented geranium, eucalyptus, palmarosa, citronella, lemongrass and chamomile	65,700.00*	500*
8	Cumin PLC	Globulus, rosemary, lemongrass, palmarosa, citrus	41,500*	600*
9	Ariti Herbal	Lemongrass, mints, rose scented geranium, myrrh, Opoponax, black cumin, Frankincense, thyme	90,900*	1990*
10	Tabor Essential oils PLC	Globules	54000*	1080*
Total				45,706

Source: Addisu, 2017 and Own Survey; Note * indicates that the data obtained in 2014 whereas the other is in 2021

Likewise, Ariti Herbal cultivates herbs around Addis Ababa and extracts essential oils for the local market as well as export markets, while Damascene Essential Oils is cultivating for the same purposes around Bonga. There are a few other companies pursuing similar business activities. Thus, there is immense potential in this area that has yet to be exploited (Afework, 2020).

Locally production of essential oils helps to save the foreign currency by substituting the import and possesses wide range of economic and social benefits such as increasing the level of investment & tax revenue, creates job opportunity for urban and rural people, encourages the farmers to produce the plants and also may support the establishment of new pharmaceutical/cosmetic industries in Ethiopia which contribute to the development of the country. It is also believed that the herbal industry is expected to be the main contributor to the country's income in the future (Fire, 2016).

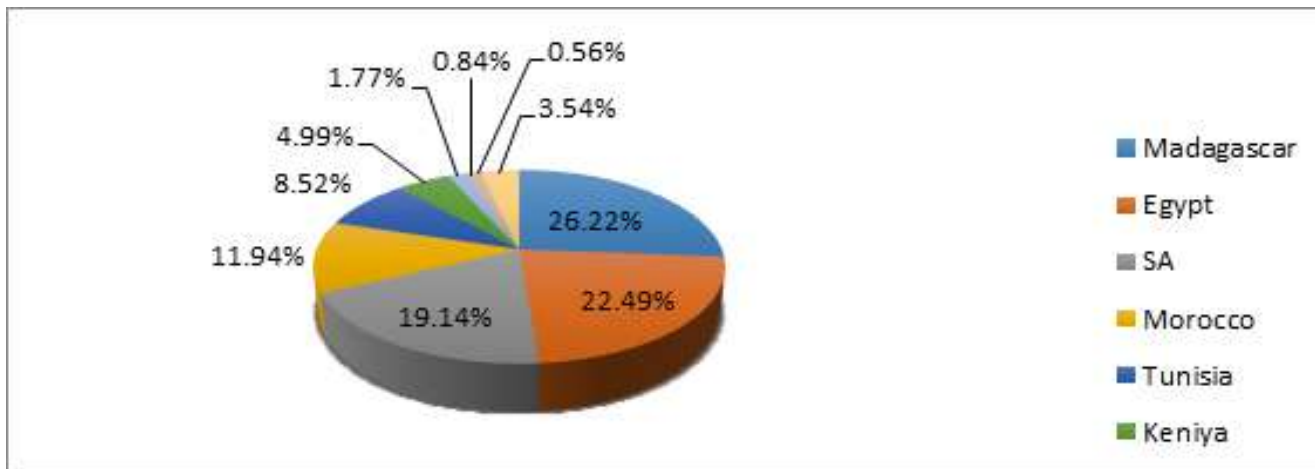
Moreover, processing of herbs and medicinal plants is environmentally friendly. Production and processing of herbs and medicinal plants is in agreement with green development policy of the government and are contributory for climate change adaptation and mitigation. Hence, the development of medicinal aromatic plants/herbs sub-sector has diverse benefits to the environment, generates income for the poor and smallholder farmers, plays a significant role in import substitution, contributes for agricultural diversification, for export promotion and creates valuable job opportunities for large number of people (EARI, 2016).

As of Abebe and Mesele (2008), one of major problems of essential oils industry in the country, like other small-scale industries, is scarcity of adapted technological input in the required level. The technological characteristics of small-scale industry can be divided into seven including economics of the scale, technological base, infrastructure base, technological level, labor intensity, linkage pattern, and their impact on environment and biodiversity. Evaluation of these factors is critical for the design and introduction of appropriate technology for a profitable small-scale agro-industry like essential oils extraction in a society. According to the information collected from the professionals in the area, the most produced essential oils in Ethiopia in production order are: Eucalyptus globules, lemongrass, citronella, rosemary, and lavender oils.

5.5.2 Trends and comparison with other African countries

Africa continues to be a significant source of a wide range of native medicinal and aromatic plants serving the global food, cosmetic, pharmaceutical, herbal and dietary supplement industries, supplying an estimated annual worldwide trade value of 60 billion USD (CFC, 2021). Compared to other essential oil producing African countries, Ethiopia contributes less than 1%. The highest share is from Madagascar (26.22%) followed by Egypt (22.49%), South Africa (19.14%), Morocco (11.94%), Tunisia (8.52%), Kenya (4.99%), Comoros (1.77%), and Eswatini (0.84%) (Figure 3). Nearly half (48.71%) of the contribution from the content is covered by Madagascar and Egypt (Figure 3).

Figure 3: Proportion of Ethiopia’s essential oils production compared with some major essential oil producing African countries;



Source: ITC (2021)

Even if the current share of Ethiopia’s essential oils in Africa is minimal, the country has diverse agro-ecology and bio-diversity to cultivate different aromatic and herb plants. This implies that production of essential oils can be scaled to match global and local market if appropriate measures are taken. There is also growing international and domestic demand that provides an opportunity for the herbs and essential oils sectors of Ethiopia to grow more. However, from the stakeholder’s discussion, the study team learned that both the aromatic/herbs and essential oil sub-sectors are currently suffering from lack of attention by the government, high degree of fragmentation in market and production, poor quality, lack of market-oriented production, limited consistent market, and lack of availability of inputs for essential oil extractors.

The competitiveness of Ethiopian aromatics/herbs can be evaluated from three angles: yield per hectare, quality in terms of oil content, and price. The yield of production per hectare of land is an important factor, which makes a specific area more attractive to investors. Ethiopia is competitive on account of having the right agro-ecology for producing greater yields per hectare for quite a number aromatics/herb. Similarly, the content of oil is one of the parameters to gauge the quality of aromatics/herbs. Ethiopian aromatics/herbs are more competitive in oil content compared to other herb-growing and exporting countries (Afework, 2020).

When the price of Ethiopian essential oil is compared with other African counties and world major essential oil exporter countries, relatively Ethiopia has high market price per kg of essential oils. For instance, the price of Eucalyptus essential oil in Ethiopia has better unit price other than that of South Africa and Siri Lanka (Table 2). The same is for Citronella oil, lemongrass oil, Rosemary oil, Mint (for both pepper and spear mint), oil, Lavander oil and Rose oil. This might be due to the organic-ness of Ethiopian essential oil products. However, for the future the country must give due attention to improve the quality of the products to be better competitive.

Table 2: Market competitiveness of Ethiopian essential oil with other countries 2015.

Name of essential oil	Countries Value in USD/kg															Market
	Ethiopia	India	USA	Bulgaria	France	China	Spain	Australia	Madagascar	Sir Lanka	Brazil	Egypt	Morocco	Tunisia	South Africa	
Globuls	51.93	-	-	-	-	19	-	46.45	39	61	-	-	-	-	64	Hotels and Spa, massage houses, steam, sauna bath
Citriodora	28	-	-	-	-	15	-	23.23	41	15	-	-	-	-		Soap, detergent and aroma
Lemongrass	68.83	19-25	-	-	-	-	-	-	71	-	-	-	-	-	15	Soap, detergent and aroma
Citronella	45	-	-	-	-	18	-	-	-	25	-	-	-	-	-	Massage houses
Rosemary	151	-	-	-	-	-	59.82	-	-	-	-	54.18	73.35	-	-	Hotels and Spa, massage houses
Mint	91	30-70	33-37	7.3 - 255	37-70	28.9	23-27	41-45	-	15.4	38-42	36-87	45.5	-	-	Hotels and Spa, massage houses
Lavender	97.21	-	-	71.1	40.62	-	55.29	232.33	-	-	86.92	-	-	-	18.4	Cosmetics formulation
Rose	9000	-	-	6208	-	-	-	-	-	-	9255	-	-	-	-	

Source: (ECC (2020); UN COMTRADE (2020) and Priyamvada Sanganeria. (2020). Essential Oils Market Report, Ultra International BV. Spijkenisse, Holland.

5.5.3 Domestic consumption patterns and trend in Ethiopia

The demand projection in Ethiopia exhibits that the domestic demands for essential oils are substantially increasing with time. This increasing demand of essential oils, such as ginger oil has opened up wide opportunities for global and local market and this leads to the requirement of competitive product in market which comes with all the advantages in terms of cost, quality and its production time. Therefore, it is important to identify an optimum extraction technique, so that a higher quality of crude oil with higher yield can be extracted.

The worldwide market for essential oils has been estimated at \$2.6 billion, with an annual growth rate of 7.5 percent. On average, in Ethiopia more than 6 million US dollar has been allocated every year to import the essential oils (CIA, 2010). This presents the existence of huge demand for the product and the burden it is exerting on the country 's foreign currency (Fire, 2016). Currently, industrial demand for essential oils is also met through import. Various types of essential oils that are imported to Ethiopia can be categorized under some major groups according to their application. These are for: Perfumery, Pharmaceutical, Cosmetics, Toiletries, and Confectionery industries. The local demand for pharmaceutical, cosmetics, soap and detergent factories, alcohol and liquor industries ingredients are relatively increasing over time. The local industries import over 50% of the raw material requirements mainly from India, Brazil, Israel, South Africa and Germany.

The study has shown that there is a clear growing international and domestic demand for the essential oils due to the growing awareness about the benefits of natural ingredients and the increasing disposable

income, which results in people spending more money on expensive natural products. The increasing health consciousness among people fuels this demand further by leading to more liberal spending on good-quality natural products, which would provide long-lasting results. The increased production of herbal health care formulations; herbal based cosmetic products and herbal nutritional supplements are also contributing for the demand.

Moreover, according to Ethiopian Institute of Agricultural Research (2016), the local demand for essential oils was estimated to be 1800 tons. The report also indicated that the demand for essential oils and odoriferous substances has increased fourfold between 1997 and 2011. The market at that time was estimated to grow at a 14% CAGR. The major essential oils extracted in Ethiopia are from Eucalyptus, Lemongrass, Mint and Rosemary. In addition, there is one company, Terra PLC that extracts Rose oil primarily for a German company.

Table 4: Average essential oil demand by Massage centers in Ethiopia

Essential oil type	Monthly demand (lit)	Price per liter
Globules oil	0.35	2500
Lavender oil	2.86	4680
Lemongrass oil	3.58	3314
Rosemary oil	3.58	7312

Source: Own source, 2021

Table 4: Average Essential oil demand by soap and detergent factories in Ethiopia

Essential oil type	Monthly demand (lit)	Price per liter
Citronella oil	209.00	3921
Lemongrass oil	113.46	3314

Source: Own source, 2021

Table 3 and 4; show the average essential oil demand by massage centers, and soap and detergent factories in Ethiopia, respectively. In general, Ethiopia consumed a huge number of essential oils, herbs and modern medicines. This indicates that there is existence of high demand for essential oils, aromatics herbs, medicinal plants and their applications. Therefore, even though the sector is in progressive stage, it is important to do in harmony to increase the market size of medicinal, aromatic/ herbs plants, and extract products within the local market to solve the consumption problem of the increasing population of the country.

5.5.4 Trade: Export and Import Trends and Potentials

A. Essential Oils

Ethiopia is endowed with a diversity of flora, most of which has remained unexploited. Essential oils application as antioxidant, in aromatherapy, perfumery and other related industries are limited due to lack of adequate research on the chemical and biological potential of its raw materials.

Medicinal plants and extracts are increasingly important export products for many developing countries. As population's age and consumers' preference for natural health products increases, medicinal plants present a niche that exporters in many least developed countries (LDCs) are looking to develop for sustainable production and export trade. ITC's Market Insider reports on medicinal plants and extracts address the lack of readily available market information on the international trade of Medicinal Plants produced and exported by developing countries and LDCs (ICT, 2021).

The global export trade value of essential for the year 2020 was 5.29 billion USD. The leading exporter countries of essential oils are India, USA, France, China, and Brazil. According to their order of rank with the market share of 15.8%, 15.2%, 9%, 5.8%, and 5.1%, respectively. Whereas, USA (20.2%), France (7.8%), Germany (6.9%), China (5.2%), and UK (5.2%), are the leading importers with the total value of 5.24 billion USD (ITC, 2021). The average trade volume shows a steady growth globally; imply that the market size is constant in the last five years.

The exports share of the world for essential oils ordered as Europe (33.8), Asia (30.5), North America (17.9%), Latin America and the Caribbean (12.6%), Africa (5%) and Oceania (1.8). Almost 2/3 of world's essential oils export covered by Europe and Asia continent only. From the African continent, Madagascar, Egypt, South Africa, Morocco, and Tunisia are the leading top five essential oils exporter to the world. Whilst, Ethiopia is found in the 12th rank from African countries and out of 190 exporter countries, takes the 82nd stages with 0.5% and 0.028% market share from Africa and the world essential oils market, respectively. Whereas, Madagascar, Egypt, and South Africa ranked 16, 19 and 21 from the global exporters (ITC, 2021). In African: Nigeria, South Africa, Egypt, Ghana, Botswana, Angola, Kenya, Uganda, Sudan and Ethiopia are listed out as the major essential oils' importers from the continent. South Africa ranked 30 from global importer of 225 country followed by Egypt (43th), Nigeria (48 th), Kenya (52 th), Eswatini (55 th), Tanzania (56 th) and Ethiopia (102 th) rank with a share of 0.012% and 0.7% from world and African continent import. South Africa holds around 28% of the continent share.

Currently, Ethiopia is importing phenolic compounds or essential oils from abroad for chemical and pharmaceutical uses although the main constitute of Thyme leaves oil is used as a raw material in different chemical industries. Thyme leaves is considered as one of the most important sources for the extraction of phenolic compounds with strong antioxidant activity. Thyme extracts, enriched in phenolic compounds are effective antioxidants due to their phenolic hydroxyl groups but they also possess plenty of other beneficial effects like flavor in cosmetics, antimicrobial, antiviral, anti-inflammatory, antitussive, antifungal, ant oxidative, antiseptic, and antispasmodic activities. They are also used for aromatherapy, a natural remedy to cure psychological stress and poor physical conditions, and are also used as food flavorings to be added to beverages, confectionery and other processed foods, and as cosmetic fragrances for perfume products or toiletries (Tsige, 2019). In addition, the imported processed products of aromatic plants and products are available in all supermarkets and shops of the country. Indicating Ethiopia is spending huge foreign currency for importation of these items in addition to essential oils (Beemnet, 2015).

Table 5: Ethiopia Imports and Exports of Essential oils, Value (US\$) and volume (Kg) from 2012–2020.

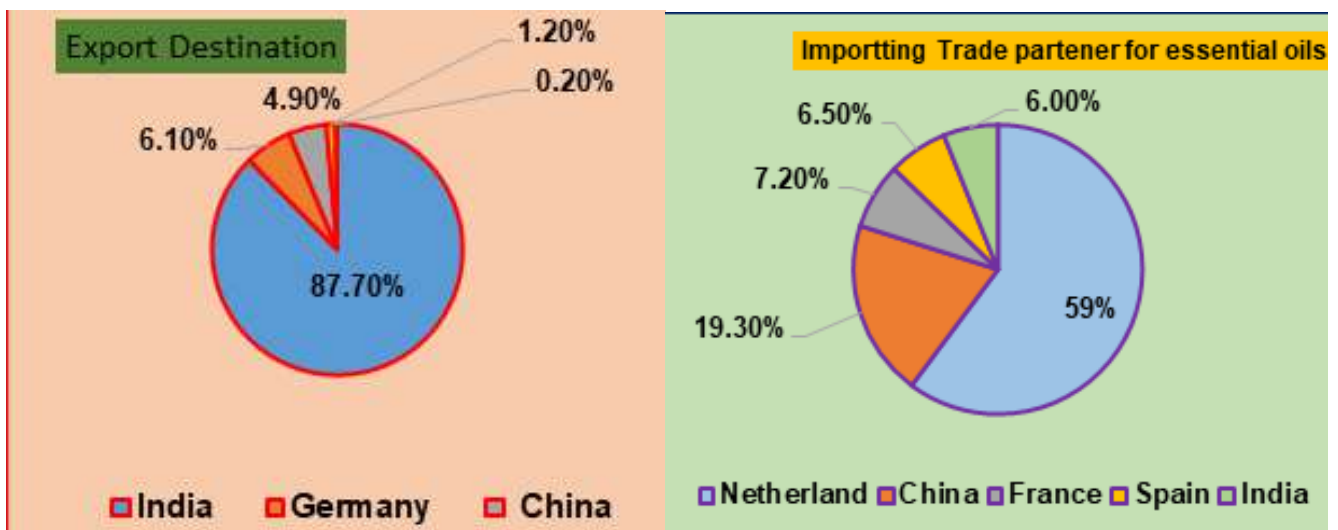
Year	Export		Import	
	Volume (Kg)	Value (USD)	Volume (Kg)	Value (USD)
2012	1037	26672	56373	871951
2013	400	15629	60987	645322
2014	5366	53149	97613	1098765
2015	764	42743	51200	541189
2016	160	430	87307	1023897
2017	310	8401	91232	712137
2018	58	1298	42158	284406
2019	32000	1325000	79000	817000
2020	22000	1501000	73000	649000

Source: ITC, (2021), UNCOMTRADE (2021), and Own Computation based on ECC

Referring to Table 5, the value of exports of commodity group of “essential oils (terpeneless or not), including concretes and absolutes; resinoids; extracted oleoresins; concentrates of essential oils in fats, in fixed oils, in waxes or the like, obtained by effleurage or maceration; terpenic by-products of the deterpenation of essential oils; aqueous distillates and aqueous solutions of essential oils” from Ethiopia is the total value about 1501 thousand (USD) in 2020, and on average the country has exported 62095 kg from the year 2012-2020. The total imported volume of essential oils is 73,000 kg and Ethiopia has expended 649,000 (USD) at the same year with average volume of 566190 kg from 2012-2020. Sales of commodity group essential oils from Ethiopia decreased by 79.4% in value terms compared to 2019. Exports of essential oils increased by \$ 176 thousand whereas, the volume of export has decreased by 68.75%.

The major export destinations of essential oils from Ethiopia in 2020 were India, Germany, China, France and Japan, in which India took a share of 87.7% (1317 thousand US\$) and the top trading partners for import of essential oils to Ethiopia in 2020 were Netherland, China, France Spain and India with the share of 59 %, 19.3%, 7.2%, 6.5% and 6%, respectively (Figure 4).

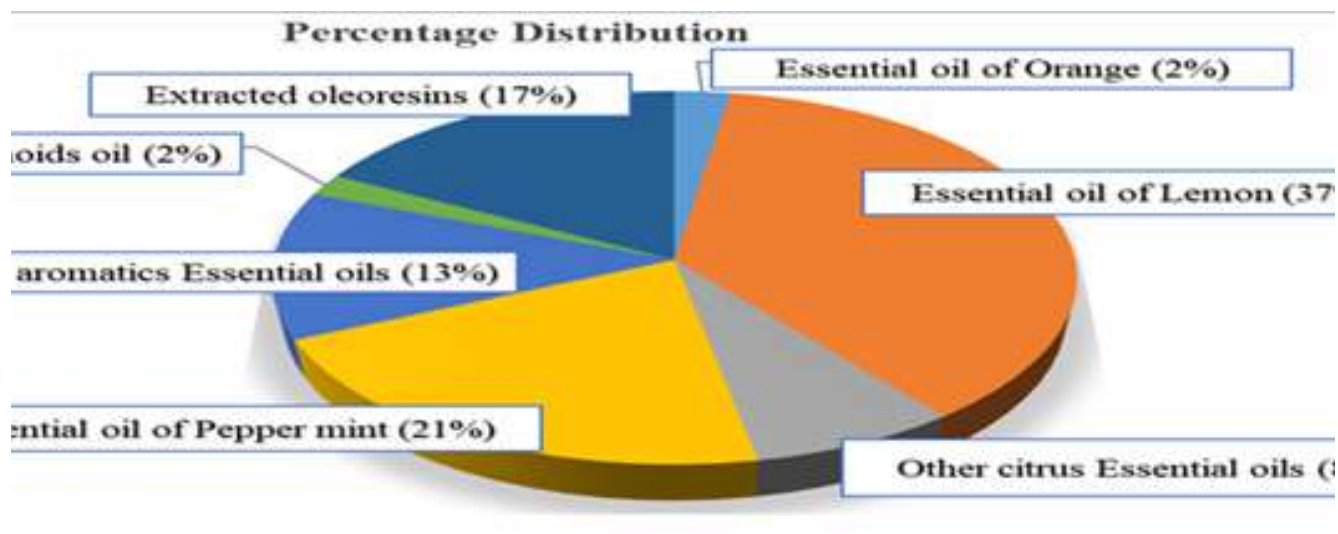
Figure 20: Export destination and import trading partners of Ethiopian Essential oils at 2020.



Source: ITC (2021)

As can be seen from Figure 5, around 1/3 of essential oils import to Ethiopia goes to lemon essential oil, followed by pepper mint, oleoresin, other aromatics oil (like lavender, rosemary, sage etc...), other citrus fruit oil (other than bergamot, orange and lemon), orange and resinoids oil. Ethiopia imports 6998, 104845, 21735, 60251, 36537, 5250 and 48787 kg orange, lemon, other citrus, pepper mint, other aromatics, resinoids and extracted oleoresins essential oil by the year 2018.

Figure 5: Types of essential oil imported to Ethiopia by the year 2020 G.C.



Source: COMTRADE, (2021).

B. Essential Oil Based Formulated Products

The antimicrobial and antifungal activities of essential oils are of great interest in the food, cosmetic, and pharmaceutical industries, since their possible use as natural additives minimizes deterioration of these products. Cosmetic preparations such as creams, gels and ointments containing essential oils (e.g., rosemary oil, eucalyptus oil) do not necessarily require an additional chemical preservative

Nowadays, different products are formulated using essential oils as a source of active ingredients and/or additives. Pharmaceutical and/or cosmetics products prepared based on essential oils include:

- Preparations for oral or dental hygiene, including tooth pastes and powders.
- Preparations for use on hair such as shampoos; preparations for permanent waving or straightening; hair lacquers; brilliantine (spirituous); hair cream, hair dyes.
- Beauty or make-up preparations and preparations for the care of the skin (other than medicaments), including sunscreen.
- Mixtures of odoriferous substances and mixtures, including alcoholic solutions, based on one or more of these substances, other preparations based on odoriferous substances, of a kind used for the manufacture of beverages.
- Perfumes and toilet waters
- Pre-shave, shaving or after-shave preparations, personal deodorants, bath preparations

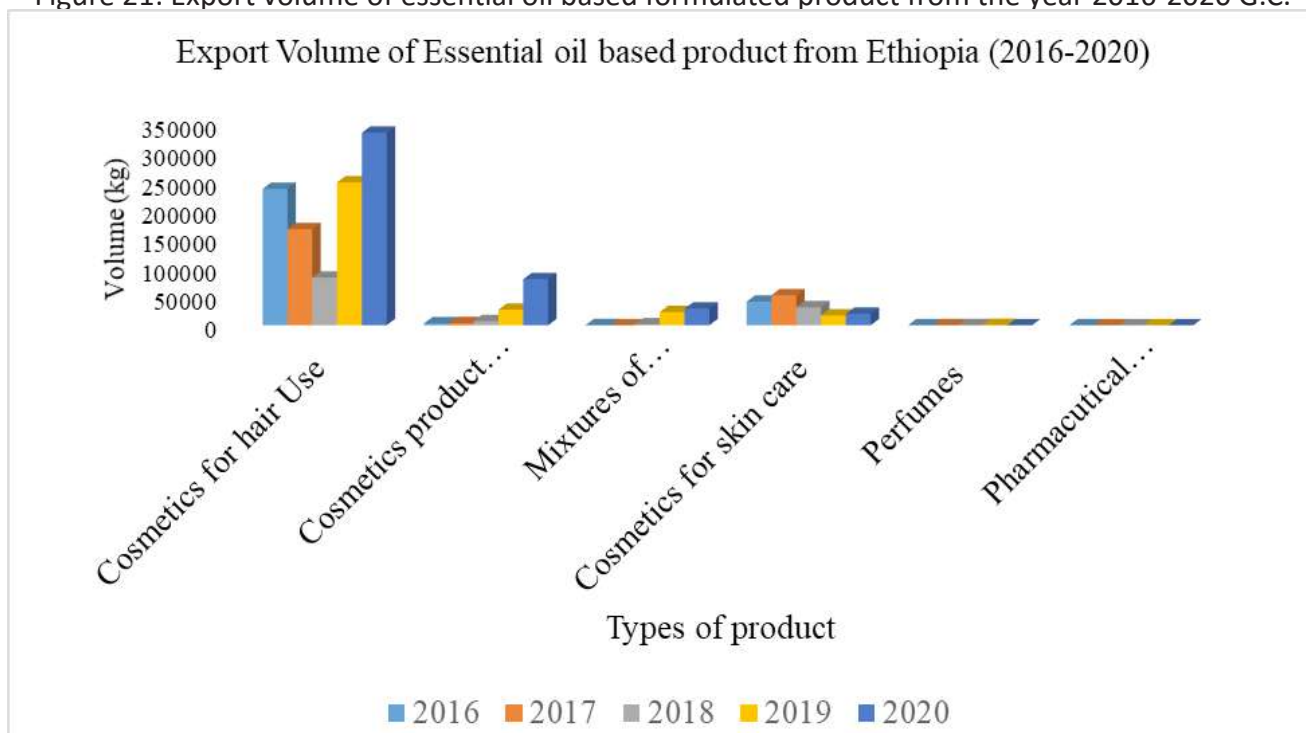
i. Export of essential oil-based products from 2016-2020.

The production and export of essential oil based pharmaceutical formulations in Ethiopia is very weak. The information gathered during the FGDs and KII, revealed that in Ethiopia there is no pharmaceutical industry that formulates essential oils based pharmaceutical products, which fulfills the demand for those imported similar products. The export data collected from Ethiopia’s custom commission and ITC also showed that the country’s export of essential oils for pharmaceutical products is zero. However, the country gets foreign currency by exporting different essential oils based formulated cosmetics like creams, shampoo, deodorant, hair oil, perfumes, and beverage products such as flavored alcoholic and non-alcoholic beverages mainly to Europe, Asia and Africa continents.

Figure 6 shows that on average, from the year 2016 to 2020, Ethiopia has exported 213.6 tone cosmetics products for hair use, 24.29 tone cosmetics products like deodorants, 10.75 tone flavored alcoholic and non-alcoholic beverages, 32.28 tone cosmetics products mainly used for skin care and 0.14 tone perfumes with average values of \$455.6 thousand, \$116.4 thousand, \$36.47 thousand, \$ 18.8 thousand and \$0.7 thousand, respectively. In 2020, Ethiopia earned \$1.129 million by exporting essential oils-based commodity. Detailed import vs export data are presented in Table 6 and 7. As can be seen from the tables, top export destinations of “preparations for use on the hair” from Ethiopia in 2020 were Sudan USA Switzerland, Germany and Netherlands with a share of 28, 16.1, 12.3, 12.2 and 10.3%, respectively. Similarly, top export destinations of “beauty or make-up preparations for the care of the skin” from Ethiopia in 2020 were Djibouti, Kenya, South Africa Italy and China with a share of 82, 4.25, 3.92, 1.8 and 1.82%, respectively.

Top export destinations of “pre-shave, shaving or after-shave preparations, personal deodorants, bath preparations, depilatories and other perfumery cosmetics from Ethiopia in 2020 were Saudi Arabia, China, Korea, USA and Germany with a share of 40, 15.9, 12.9, 12.5 and 11.9%, respectively. The study finding showed that the top export destinations of “perfumes and toilet waters.” from Ethiopia in 2020 were Australia and Nigeria with a share of 88and 11.2%, respectively.

Figure 21: Export volume of essential oil based formulated product from the year 2016-2020 G.C.



Source: ITC, COMTRADE and ECC, (2021)

Table 6: List of exported essential oil based formulated product from Ethiopia for the 2016-2020.

Product Type	2016		2017		2018		2019		2020	
	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)
Preparations for use on the hair	236702	594654	166858	381598	82601	224850	248000	434000	334000	643000
Shaving preparations, incl. pre-shave and aftershave products, personal deodorants, bath etc..	3328	9937	3833	13823	7267	63398	27000	95000	80000	400000
Mixtures of odoriferous substances and mixtures, incl. alcoholic solutions	77	173	0	0	1691	6385	23000	103221	29000	72576
Beauty or make-up preparations for skin care	41098	15998	52105	17857	31216	15196	17000	34000	20000	11000
Perfumes	50	376	119	532	73	354	421	2000	46	247
Preparations for oral or dental hygiene,	0	0	0	0	0	0	0	0	0	0

Table 5: List of imported essential oil based formulated product to Ethiopia for the 2016-2020.

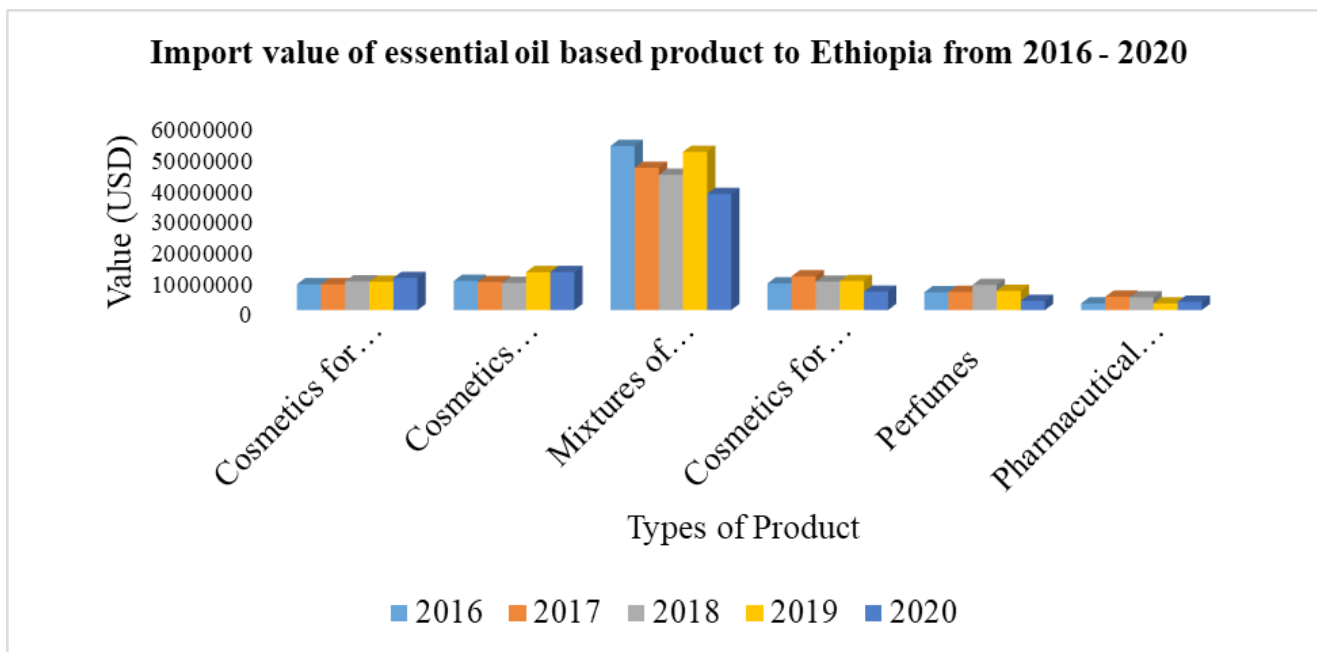
Product Type	2016		2017		2018		2019		2020	
	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)
Preparations for use on the hair	4995.7	8.3	4782.6	8.4	5593.0	9.3	5727.0	9.2	6372.0	10.4
Shaving preparations, incl. pre-shave and aftershave products, personal deodorants etc...	3585.0	9.4	3732.7	9.1	3330.4	8.8	4643.0	12.3	4488.0	12.3
Mixtures of odoriferous substances and mixtures	2632.3	53.0	2488.8	46.0	2118.7	43.7	2590.0	51.1	2156.0	37.5
Beauty or make-up preparations for skin care	3611.4	8.6	4666.1	10.9	5629.6	9.2	4298.0	9.4	2433.0	5.9
Perfumes	108.0	5.8	479.9	5.9	234.4	8.1	84.0	6.2	34.0	3.0
Preparations for oral or dental hygiene, incl. tooth pastes and powders	375.9	2.2	988.9	4.3	981.7	4.1	532.0	2.1	624.0	2.7

Top export destinations of “Mixtures of odoriferous substances and mixtures (including alcoholic solutions) with a basis of one or more of these substances, of a kind used as raw materials in industry; other preparations based on odoriferous substances, of a kind used for the manufacture of beverages.” from Ethiopia in 2020 were USA with a share of 78%, Kenya with a share of 20%, and Sudan with a share of 1.89%.

ii. Import of essential oil-based products from 2016-2020

The value of imports of commodity “preparations for oral or dental hygiene,” to Ethiopia totaled \$2.15 million in 2016, \$4.32 million in 2017, \$4.11 million in 2018, \$2.13 million in 2019, and \$2.71 million in 2020. The share of purchase for this commodity to Ethiopia decreased by 33.89% and in value terms \$1393 thousand compared to 2018 but increased by 27% and in value terms \$0.578 thousand compared to 2019. On average Ethiopia imports 15308, 17139, 17888, 17874, and 16107 tone of oral or dental hygiene product for the year 2016, 2017, 2018, 2019, and 2020, respectively.

Figure 7: Import value of essential oil based formulated product from the year 2016-2020 G.C.



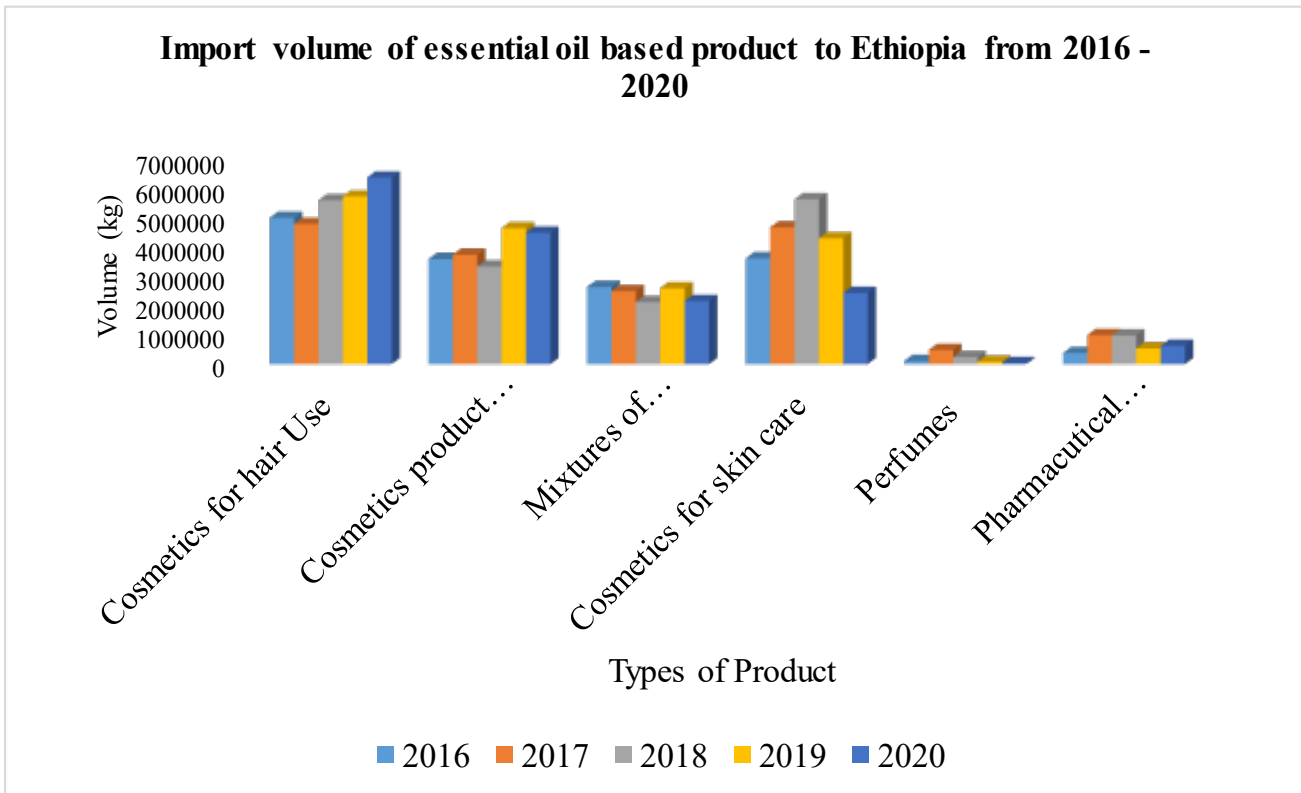
Source: ITC, COMTRADE and ECC, (2021)

The top five trading partners for commodity group under preparations for oral or dental hygiene to Ethiopia in 2020 were Egypt, Thailand, China, United Arab Emirates and South Africa with a share of 55, 11.2, 7.87, 7.15, and 5.11%, respectively.

The value of imports of commodity “preparations for use on hair,” to Ethiopia totaled \$8.34 million in 2016, \$8.37 million in 2017, \$9.29 million in 2018, \$9.19 million in 2019, and \$10.39 million in 2020. The share of purchase for this commodity to Ethiopia increased by 11% and in value terms \$1105 thousand compared to 2018; also increased by 13% and in value terms \$1200 thousand compared to 2019.

On average Ethiopia imports 4996, 4783, 5593, 5727 and 6372 tons of cosmetics products primarily used for hair treatment for the year 2016, 2017, 2018, 2019, and 2020, respectively. The top five trading partners for commodity group under preparations for use on hair of Ethiopia in 2020 were China, United Arab Emirates, Turkey, USA and South Africa with a share of 37, 16.3, 9.14%, 7.77 and 5.44%, respectively.

Figure 22: Import volume of essential oil based formulated product from the year 2016-2020 G.C.



Source: ITC, COMTRADE and ECC, (2021)

The value of imports of commodity “Beauty or make-up preparations and preparations for the care of the skin,” to Ethiopia totaled \$8.62 million in 2016, \$10.94 million in 2017, \$9.15 million in 2018, \$9.38 million in 2019, and \$5.94 million in 2020. The share of purchase for this commodity to Ethiopia decreased by 35% and in value terms \$3210 thousand compared to 2018; also decreased by 36% and in value terms \$3444 thousand compared to 2019. On average Ethiopia imports 3611, 4666, 5630, 4298, and 2433 tone of cosmetics products primarily used for beauty or make-up of the skin for the year 2016, 2017, 2018, 2019, and 2020, respectively. The top five trading partners for commodity group under beauty or make-up used for the care of the skin of Ethiopia in 2020 were China, Indonesia, South Africa Germany and United Arab Emirates with a share of 26, 25, 14.5, 8.88 and 6.09%, respectively.

The value of imports of commodity “Perfumes” to Ethiopia totaled \$5.79 million in 2016, \$5.86 million in 2017, \$8.14 million in 2018, \$6.19 million in 2019, and \$2.97 million in 2020. The share of purchase for this commodity to Ethiopia highly decreased. The data shows the import value in 2020 decreased by 52% (more than half) as compared to 2019. On average Ethiopia imports 188 tons of cosmetics products primarily used for perfumes from the year 2016 -2020.the top five trading partners for commodity group under perfumes of Ethiopia in 2020 were France (91%), Spain (5.88%), United Kingdom (0.71%), Italy (0.63%) and China (0.53%).

The value of imports of commodity “Mixtures of odoriferous substances and mixtures” to Ethiopia totaled \$53 million in 2016, \$45.97 million in 2017, \$43.7 million in 2018, \$51.14 million in 2019, and \$37.53 million in 2020. The share of purchase for this commodity to Ethiopia in 2020 went down by 26.6% (more than half) as compared to 2019. On average Ethiopia imports 2397 tone of mixtures of odoriferous substances and mixtures from the year 2016-2020. The top five trading partners for commodity group under mixtures of odoriferous substances and mixtures of Ethiopia in 2020 were Ireland, Egypt, India, Spain and United Kingdom with a share of 71%, 11.9%, 5.74%, 2.26% and 1.37%, respectively.

The value of imports of commodity “pre-shave, shaving or after-shave preparations, personal deodorants, bath preparations, depilatories and other perfumery, cosmetic or toilet preparations,” to Ethiopia totaled \$9.43 million in 2016, \$9.07 million in 2017, \$8.79 million in 2018, \$12.27 million in 2019, and \$12.29 million in 2020. The share of purchase for this commodity to Ethiopia was almost constant (increased by 0.19%) as compared to 2019 where it increased by 35% and in value terms \$3210 thousand compared to 2018; also decreased by 39.76% and in value terms \$3444 thousand compared to 2019. On average, Ethiopia imports 3955 tone of cosmetics products primarily used for those products from the year 2016-2020. The top five trading partners for commodity group under pre-shave, shaving or after-shave preparations, personal deodorants, bath preparations, depilatories and other perfumery, cosmetic or toilet preparations of Ethiopia in 2020 were India, China, Saudi Arabia, South Africa and United Arab Emirates with a share of 40, 22, 8.4, 72% and 7.71%, respectively.

5.6 Analysis of the Essential Oils Value Chain

i. Value Chain Map

Mapping the value chain of the product or commodity is used to analyze the value chain, understand the characteristics of the chain actors, their link to each other, the flow of production, and the flow of information through the chain. The finding of this mapped essential oils plants value chain from pharmaceutical usage perspectives based on the relevant information collected. The value chain of essential oils plants is an array of processes starting from planting or sawing of the plants to use to consumption of the essential oils. The core processes (as depicted in Figure 10) identified across the value chain includes production of the essential oils’ plants, collection of the fresh or dried produces, processing or oil extraction, marketing of processed products and consumption.

Since Ethiopia is endowed with varied topography and climate, the country is home for different plant species that grow on its highlands and rift valley as well. The growing practices of essential oils plants, however, are majorly limited to individual farm holders and traditional cultivation practice is dominating.

As the main objective of this study is to make value chain analysis, the existing value addition processes are mapped in their logical sequence, examined and limitations are identified to improve the efficiency through appropriate intervention at the various level along the value chain. Furthermore, after identifying the core processes, the detail major activities in the core processes, the main actors and the service providers are identified and mapped (Figure 4). The roles of each actor and service providers along with their respective limitations were also identified and possible intervention which can be implemented at the various stages and, which can have assumed to improve the chain, has been forwarded (Table 8).

The direct market actors are, those involved in essential oils plants trade, and those who order the flow of essential oils plants in time and space. These include producers, local collectors, primary cooperatives,

processors and consumers. The chain supporters are involved in technical advice, service provision and policy formulation and implementation of the chain. Technical advice like extension services and marketing information along essential oils plants value chain are provided by Development Agents, Bureau of Agriculture, Agricultural Research Center and NGOs.

ii. Main operational Actors involved in the value chain processes and their functions

The main operational actors involved in the essential oils plant value chain processes are shown in Figure 10. These actors include public institutions, the private sector, traders, NGO's, farmers' cooperatives or unions, household farmers, commercial farmers and Associations. Each actor plays a wide range of roles. An overview of the value chain and the roles of the different essential oils plants value chain actors are matrix in the Table 8.

Farmers: the initial value adding activities are carried out by farmers who produce the fresh essential oils bearing plants and supply them to the next level in primary market. The main farmers are individual holders that cultivate and grow the plants in traditional way. However, based on the focused group discussion and key informants interview conducted in this study, there are cases in point those commercial farmers (in South nation nationalities region, Siltie zone and North Shoa zone, Debrebrehan) and non-organized out growers' association with importers and exporters. Sometimes, they dry the plants or herbs and supply to local market as well.

As the plants are perennial crops, which highly compete with other subsistent and commercial crops and plants, the essential oil-bearing plants are not for direct consumption. Furthermore, the export market highly requires quality assurance. Thus, the commercial farmers are greatly recommended to involve in the business. This can increase in the competitiveness of the firms along the value chain at local and international market.

Local Collectors: It is the first link between producers and other traders or processors. Based on focused group discussants and key informants, these are small trading individuals who collect the product in small quantity directly from producers and resell to oil extractors and exporters in a more marketable quantity. They act as intermediaries who do not add value but merely share the benefit that could have accrued to the farmers. They use their financial resources and their local knowledge to collect a relatively larger mass of essential oils produces from the surrounding area. They play important role and they know areas of surplus as well. Collectors are the key actors in the essential oils' plants value chain, and are responsible for the trading of essential oils plants from production areas to wholesale and retail markets.

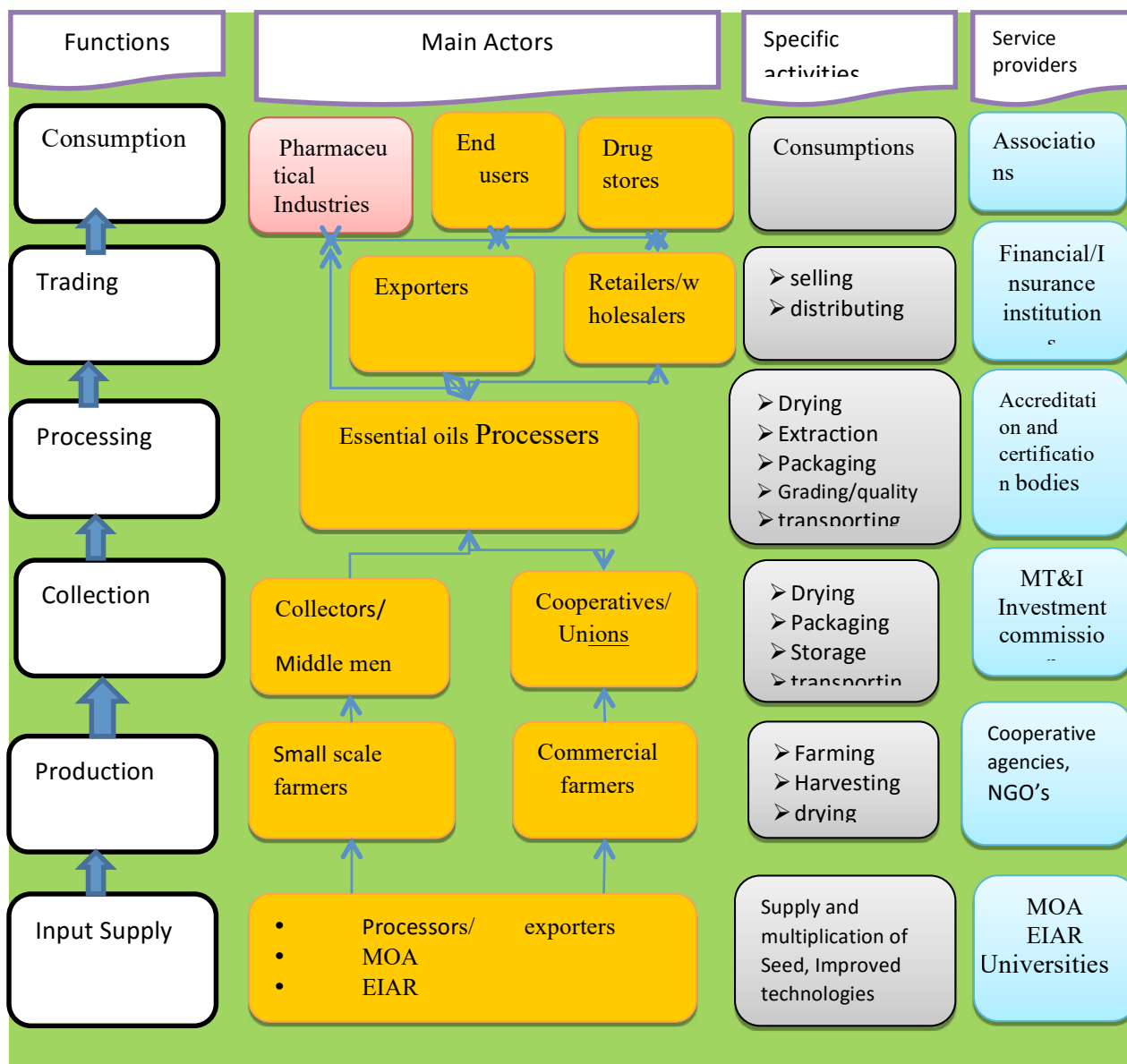
Processors: processors are the main value-adding actors next to farmers in their logical sequence across the value chain. Processors in essential oils plants value chain are companies engaged in the extraction and packaging of the essential oils which can be sold locally for different level of consumption and use. The processed products can also be supplied for exporters to international market. The processors set or adopt product quality standards and ensure their system so that it can produce the processed product as per the customer requirements.

Essential oils plants processors have better capacities in terms of finance and other facilities. There are some cases that processors work together with outgrowing individual holders so that cluster-farming practice is realized. They provide price information, improved seed and advance payments for selected reliable clients. They have also better storage, transport and communication access than the farmers and collectors.

Retailers/ drugstores: Retailers are also important primary actors in the essential oils’ plants value chain in the study area. They are drug stores or pharmacies. Their duty is to buy the essential oils from processors through negotiations and store it to their temporary storage. Then they sell the extracted oils to nearby consumers.

Cooperatives/ Cooperatives unions: Unions can collect fresh and dried produces of essential oils plants from each farm household through their member cooperatives. The cooperatives, on the other hand, collect the essential oils plants mainly from their member farmers. The unions store and pack the essential oils plants and look for local or export sale outlets. However, this important actor is underutilized and inactive in the value chain of essential oils plants in the country.

Figure 10: Essential oils Value Chain Mapping



Exporters: one of the major operators in the essential oils’ plants market are the exporters. They are the largest buyers of essential oils plants from the processors and majority of the exporters are processors. These large-scale exporters, mostly located in Addis Ababa, have their own buying branches. They buy on the spot market, on cash from anyone willing to sell, competing merely on prices.

Supporting Actors: Such actors are those who provide supportive services including training and extension, information, financial and research services. Access to information or knowledge, technology and finance determines the state of success of value chain actors. Primary cooperatives, micro finance, NGOs and government Offices are main supporting actors who play a central role in the provision of such services.

Table 6: Roles, limitations and possible areas of intervention across essential oils value chain actors and support institutions.

Functions/Actors/service providers	Role	Limitation	Suggested intervention
1.Input- seed, fertilizer chemicals/pesticides/ herbicides			
Chemical suppliers (chemical fertilizer, herbicides, pesticides)	Purchase and distribute	Seasonality of supply for inputs; inconsistent supply	Integrate with Unions, financial institutions for reliable and sustainable supply
Improved Seed suppliers Seedlings (seed multiplications) Polyethylene bags	Seed multiply and distribute; seed multiplication input (such as polyethylene) bag suppliers	Limited improved seed supply, seed multiplication and distribution are limited to exporters, processors and public research institutions; inadequate priority in the area; limited access and linkage to polyethylene bag supply	Promote private seed multipliers; Arrange credit facilities, create access to input supply for multiplication, and improvement; create strong linkage among, input suppliers, farmers, seed multipliers, exporters and processors
2. Essential oils plants Producers/cultivators			
farmers at house hold level	Produce plants (dry and fresh) and supply it to the nearby market, collectors, farmers’ cooperatives	lack of access to market and information; improved seed shortage; lack of technical support, limited agricultural extension service; skill and knowledge gap in farming and post-harvest handling	Increase awareness level (on improved farming practice, postharvest handling) through continuous training; stakeholder engagement; increase the agricultural extension service and provide improved technologies in a consistent way
Private Commercial farmers	Produce essential oils plants; supply to local and export market	A few in number (so far in Siltie Zone only); farm land scarcity, improved seed or	facilitate provision of land, support contract farming with policy and regulations;
		technology shortage; low financial capacity; limited priority by support giving government institutions	increase the agricultural extension service and provide improved technologies in a consistent way; focus and priority should be given by service providers; awareness creation and stakeholders’ engagement

Functions/Actors/service providers	Role	Limitation	Suggested intervention
Farmers Unions/ Cooperatives	Collect produces from farmers; Supply the produce to local market; Purchase inputs and distribute to farmers	Underutilized and inactive actor across the essential oils' plants value chain. Poor business management, low financial capacity, lack entrepreneurial skills, conflicts of interest reduce efficiency	Strongly involve farmers unions in the value chain. Capacitate the cooperative management members, arrange credit facility,
3. Essential oils Plants Produce Collection/primary marketing			
Essential oils plants /herbs Collectors	Collect fresh and dry essential oils plants from the source areas, farmers	Lack marketing knowledge, Lack of postharvest handling knowledge, blocks marketing information to producers, low financial capacity; weak supply chain linkage	Capacitate the collectors' knowledge (postharvest handling; packaging and transportation); organize them in legal system; arrange credit facility, provide the farmers with up-to-date market information; Strengthen the farmers linkage with exporters and processors
Brokers/Middle men	mediate deals, facilitate transactions	Tend to distort the market in their favor, usually do not add value, increasing transaction costs	Improve the market system; Regulate the market through appropriate enforcement; encourage licensing
Essential oils Exporters	Export extracted essential oils to international market	Inconsistent quality of products, supply shortage and seasonality in supply; Unreliable supply,	Introduce quality standards at farmers level ensure standard post-harvest handling practice; improve diplomacy and multilateral
		capital shortage, inconsistent demand; limitation in international market search and penetration	relationships between our country and the export market destination countries; arrange credit facility, promote essential oils plants production at national level as export valued products.
4. Processers			
Value-addition	Drying, preserving, packaging and oil extraction, control quality as per national and international standards	Inconsistent quality, supply shortage; Unreliable supply, low-capacity utilization and seasonality in input supply; limited market information for both local and export market; lack of skilled manpower; Infrastructure deficiencies	Increase production, arrange credit facility, secure supply management system; support in acquisition of market information; quality production and product grading; awareness creation and skill development, improve Infrastructure
Traders/ retailers	Store, sell and distribute products	Small traders are short of capital, limited access to market information; Lack of appropriate transportation vehicle, limited knowledge for organic products and healthy oils in local market by local consumers	Enable the small traders with market information, arrange credit facility, arrange/encourage importation of appropriate live animal vehicle; create strong forward and backward linkage in the value chain increase demand for organic products, and healthy and medicinal essential oils

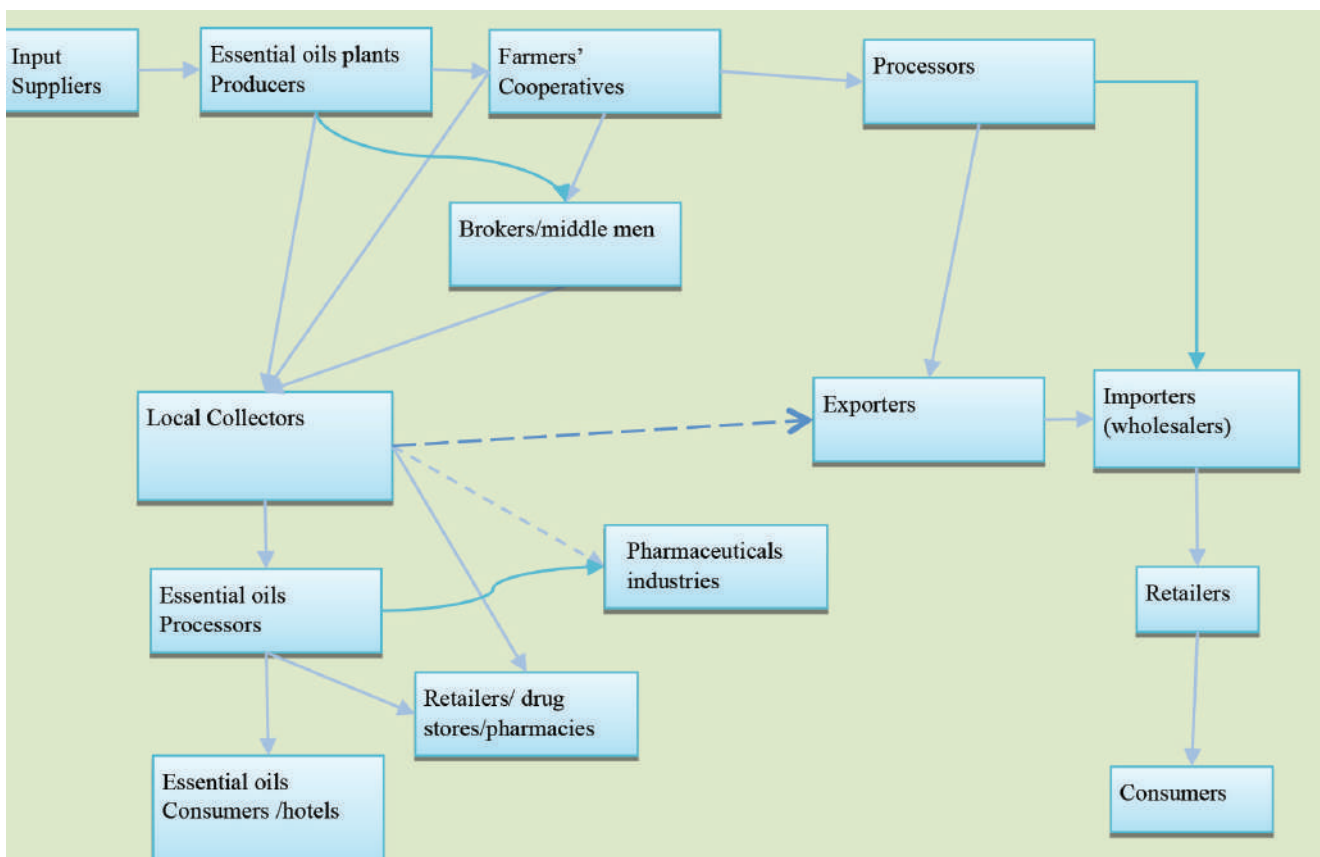
Functions/Actors/service providers	Role	Limitation	Suggested intervention
5. Consumers: household consumers, drugstores	Purchase the products and deliver to end consumers; Consume essential oils	Limitation in quality and standard product supply. Limited products accessibility	Increase product variety; develop essential oils plants product standards. Increase production and availability. Promote use of essential oils plants products.
6. Support service providers			
6.1. Government Institutions			
Federal and regional agricultural extension service providers	Facilitate linkages, demonstrate technologies, deliver trainings on essential oils plants product processing, production and use	Limited priority as compared to other main crops; bureaucratic service	Increase priority for essential oils plants product production, strengthen farmers training services, develop transparency and minimize bureaucracy; ensure transparency and governance
Federal and Regional trade and industry bureaus/offices	Support financial arrangement for the processing and local and export marketing of essential oils plant products; promote and facilitate investment on essential oils plants processing, marketing and use. Strengthen linkages among actors along essential oils plant value chain	Lack of integration among actors who support the essential oils plants economy along the value chain, limited commitment and priority for essential oils plants production, processing and marketing	Policy framework development and role definition so that the various actors can work in an integrated manner. Establishment and integration of offices at different level for the purpose of the essential oils' plants economy along the value chain
Universities and Agricultural Research Institutions	Conduct research to fill institutional voids; essential oils plants Production and processing technology transfer, development and demonstration; Research on improved input technologies, seed variety and processed product variety.	Limited means and ineffective methods to disseminate research results in organized, useful and easily accessible ways. Weak university-industry linkage Insufficient budget	Thematic areas should focus on essential oils plants processing technology, innovation market, financing and organizing activities along the value chain; Strengthen linkages among institutions including university & research organizations and processing firms, Allocate adequate budget
Private and public commercial financial institutions	Provide credit and insurance facility services	Lack of interest to lend for essential oils plant production,	Intervene in public and private finance institutions, allow crop insurance and give priority
Accreditation and quality systems certification Bodies	Ensure compliance with standards, examine the competence of laboratory staff, verify accredited scopes of testing/calibration and monitoring effectiveness of laboratory quality management systems	Currently, with regard to essential oils value chain, these bodies are not supporting the sector	Engage the accreditation and certification body in accreditation and certification process and create conducive environment for accreditation and quality systems certification and traceability.

iii. Market flow map

In the market flow of essential oils in Ethiopia, the flow of the product and finance as exchange from initial producers to final consumers is illustrated in Figure 11. Thus, farmers produce fresh or dried essential oils plants and directly sell them to local collectors, processors, exporters, unions or individual consumers in the nearby market. On the other hand, the collectors, the major local market, with a relatively bulker amount and little or no value addition, pack, transport and sell to processors or retailers.

While receiving directly from farmers or indirectly from collectors, the processors participate in value addition activities and they dry, extract oil and pack the product, which can be supplied to local market and international market. They attempt to produce the product based on customer requirements, whether it is domestic or international. The local consumers including individual householders mainly receive their essential oils from retailers/ pharmacies or processors.

Figure 23: Ethiopia’s Essential oils plants market value chain



iv. Business Model Analysis

The term business model refers to a company’s plan for making a profit. It identifies the products or services to sell, target market, and any anticipated expenses. Business models are important for both new and established businesses. They help new; developing companies attract investment, recruit talent, and motivate management and staff. Established businesses should regularly update their business plans or they will fail to anticipate trends and challenges ahead. Here, a business model analysis is employed to evaluate the performance of current business practices based on a business model canvas and propose a better one to improve performances based on financial and non-financial parameters (See Annex 1: Business Model Canvas).

v. Price Build up in the export market

The average price of essential oil for damask rose oil at export market is 419,040 birr per liter (Table 9). The estimation of price at market places is done based on marketing survey (field and online) conducted by study team.

Table 97: Export Market Price Make Up for Aromatics/herbs, and essential oil in ETB (2020/21)

No	Value Chain Actors	Commodity type	Average Price marks (per kg in Birr)
1	Producer/Farmers	Basil	25
		Rosemary	50
		Rue	20
2	Export	Basil	92.2
		Coriander	119.7
		Mint	115.9
		Parsley	10.2
		Rosemary	69.4
		Rue	118.3
		Thyme	44.7
3	Essential oil	Damask Rose oil	419040

Source: own survey, 2021

vi. Price Build up in the domestic market

The price makes up and mode of bargaining on the domestic market along the value chain is obtained through marketing survey (field and online) conducted by study team. The average price builds up for rosemary (fresh), basil (fresh), and rue (fresh) starts with 55-60, 15, and 30 birr per kg and end with 80, 40, and 70 birr per kg, respectively at retail markets. The average price of essential oil from rosemary oil, Eucalyptus globules oil, and lavender oil is 7312, 2500, and 4680 birr per liter, respectively (Table 10).

Table 10: Domestic Market Price Make up for Aromatics/herbs and essential oil in ETB 2020/21

No	Value Chain Actors	Type of commodity	Average Price marks
1	Producer/Farmers	Rosemary	55-60 birr / kg for fresh
		Koseret	35-40 birr/kg for fresh 160 birr/kg for dry
		Basil	15 birr/kg for fresh 160 birr/kg for the seeds
		Rue	30 birr/kg for fresh
		Ariti (Artemisia afra)	30 birr/kg for fresh
		Lemon grass	40 birr/kg for fresh
2	Local collectors (small traders, exporter and processor)	Rosemary	75 birr / kg for fresh
		Koseret	210 birr/kg for dry
		Basil	25 birr/kg for fresh
		Rue	45 birr/kg for fresh
3	Retailers	Rosemary	80 birr / kg for fresh
		Koseret	250 birr/kg for dry
		Basil	40 birr/kg for fresh
		Rue	70 birr/kg for fresh
4	Essential oil producer	Eucalyptus Globules oil	2500 birr/lt
		Lemongrass oil	3314 birr/lt
		Lavender oil	4680 birr/lt
		Rosemary oil	7312 birr/lt
		Pepper mint oil	4387 birr/lt
5	By-product	Rose water	200 birr/lt

Source: Own Survey, 2021.

5.7 Challenges and Opportunities

5.7.1 Challenges

Regardless of the excessive potential for essential oils plants growing, processing, extracting and marketing, there are some challenges, which deter the improvement and growth of the sector along the value chain in the country. Thus, the various constraints of the essential oils value chain, influencing its development have been identified from desktop review, survey, focus group discussion and key interview, are described as follows:

i. Challenges facing the supply market

The supply market at the different stages is expected to be effective in terms of availability, quality, cost and delivering time as these factors affect the performance of the supply market. The supply of inputs, intermediary or semi-finished and finished products across essential oils value chain ensures linkage strength, and also improves the efficiency of the value chain.

Input related constraints: Cultivation of essential oils plants needs supply of several inputs including improved seed varieties, seed multiplication facilities, modern growing technologies, land provision and finance. Moreover, skilled labor force and expertise support are important for the effective and efficient farming process. However, there are constraints identified in acquiring the farming inputs at the desired level of quantity, quality, time and place, which affect the productivity and production volume of the produces. The following are major constraints in input supply:

- Inadequate availability and use of improved seeds varieties (both in terms of quantity and quality)
- Seed multiplication is limited to processors and exporters
- Seedling bag scarcity
- Low improved farming technologies support service
- Limited credit availability and access, and collateral problem for accessing loans

ii. Production Constraints:

The major challenges in the production of essential oils plants/herbs are associated with the activities in the course of farming process, which comprises seed or seedling selection, farmland preparation, sowing, tending operations and harvesting. Modern agronomical practices and research supported plantation and harvesting are imperative in increasing volume and yield of the produces. In this regard, the major constraints identified are:

- Inadequate skill and knowledge in growing the plants while adopting modern technologies,
- Extension service is poor in the production of essential oils plants or herbs,
- Linkage with universities and research institutions is weak,
- Lack of the right facility particularly for drying, packaging and transporting,
- Lack of post-harvest knowledge and
- Land fragmentation and lack of good practices lead to high production prices. The primary producers are smallholders with small and dispersed plots under rain fed conditions.
- Low productivity: productivity is below potential due to limited use of improved inputs, small fragmented plots, marginal soils, limited use of improved varieties
- Marketing Constraints: The major challenges with regard to market are summarized below:
 - Inadequate infrastructure: poor market linkage such as road (feeder roads are impassable and do not link farms to markets)
 - Poor marketing infrastructure such as storage facilities, branding, ...etc
 - Weak linkage with other value chain actors,
 - Poor market knowledge
 - Challenge to enter in to the export market

The tendency to use herbal medicines increases from time to time. Moreover, there is a forecasted 9% growth in essential oils and spices demand globally. This opportunity should be exploited by identifying the challenges in entering into the export market. The major challenges which affect the global competitiveness of essential oils of the country, identified from the actors and documents reviewed are enlisted as hereunder:

- Large scale is limited due to supply limitation
- Weak market linkages with producers
- Market destination countries business diplomacy is weak
- Inadequate market intelligence
- Non-conducive business environment due to missing credit and insurance;
- Inconsistent export supply: Limited relationship between exporters and importing countries, unstable and erratic demand from importing countries leading to limited number of contracts between exporters and producers
- Inconsistent implementation of policy interventions.
- Insufficiency of certification
- Poor traceability
- Challenges of processing business
- The processing companies of essential oils have challenges related to input acquisitions, processing technologies, financial availability and method of processing among others. Other important challenges identified are:
 - Low-capacity utilization
 - Poor market integration
 - Limited raw material supply: poor quality and low supply are considered the major constraints in extracting essential oils. This might be due to low productivity and unable to meet the demand of rising number of processors.
 - Weak linkage among value chain actors: Due to the weak vertical and horizontal linkages, there is an information gap between lead-firms and producers on g soybean quality amount supply in a year.
 - Poor value addition activities: limited processing activities
 - Limited number of processors though rising recently
 - Limited use and availability of modern processing technology
 - Limited finance access across the value chain actors
 - Shortage of foreign currency for imported inputs

- Power shortage and discontinuity
- Marketing inefficiency
- Limitation related to quality standards
- With regard to the quality standards for essential oils and/or essential oils-based products, the major identified are:
- Unavailability of national quality standard systems developed on essential oils
- No traceability system practices
- Lack of knowledge on standards by farmers and businessmen
- Most farmers use traditional value adding practices for consumption
- Lack of packing materials
- Poor seed Quality

5.7.2 Opportunities

Based on literature review, survey, focus group discussion and key informant interview with different value chain actors conducted in this study, the following major opportunities for essential oil plants production, processing and marketing activities are identified.

i. Production and processing

Suitable agro climatic conditions for cultivation of wide range of biodiversity: Essential oil-bearing plants are diverse in the country. Naturally occurring wild aromatic plant species such as gums of resin types are being exported in its raw state. Adding value to such products has got tremendous positive effect to the country's overall economy in the sector. In addition, the presence of many aromatic plant species which are internationally in the trade is being studied for their agro-ecological adaptation by Agricultural research centers and Biodiversity institute (example: Wondogenet research center). Therefore, the sector has great opportunities with respect to getting genetic resources,

- Availability of different herbs and aromatic plants,
- Strong government commitment and support: plans for increasing production for processing and export market.
- Production of high value plants and herbs,
- Relatively low-cost base production and processing of essential oils
- Conducive environment for investment: Ethiopia has suitable investment policy that supports all forms of agro-industries,
- Potential market for herbs, aromatic plants and their products,
- Organic output: production of good quality essential oils helps substitution of imports and promotion of exports

- Availability of research centers /institutes
- Availability of different NGOs that promote the production, processing and marketing of essential oils across the value chain,
- Available of cooperatives and Unions,
- Availability of local processors,
- Availability of cheap labour,
- Experience of locally built extraction machines: Currently there are at least nine different size distillation units being constructed by local industries. Example: Ambo Engineering PLC and Selam Technical and Vocational College are the two important engineering units having good experience of making essential oil distillation units.
- Demand of products by processing
- Interests on essential oils processing investment is increasing
- Expansion of integrated agro-processing industrial parks,
- High demand for essential oils products on international markets,
- Infrastructure development can facilitate the marketing of essential oils value chain by creating a link between buyers and farmers,
- The existence of advantageous government policies and strong government commitment which supports small scale businesses was another opportunity for farmers

ii. Domestic Consumption

- The development of international hotels and the increase of awareness of Aromatherapy
- Increase of the demand of natural products
- Increase urbanization and population
- Processing potential demand
- Growing demand for essential oils products on international markets,
- Huge potential market for quality and sustainable essential oils, and its derivatives: Locally large number of high standard hotels is being opened in various parts of the country with various services like spa and massaging. In addition, cosmetic industries, soap factories and detergent making companies are many. Medicinal factories are also found in good numbers. Essential oils being ingredient of many products of these hotels and factories have high local potential, thereby substituting the current imports.

5.7.3 Recommended Interventions

Ethiopia has comparative advantage on the production and processing of natural plants that can be used to produce various end products. Moreover, the global demand for essential oils is increasing by % every year. Furthermore, due to increased number of international hotels, population growth and preferences to natural products because of health concern, the local demand is also increasing.

As described in section 5 of this document, the potential use and growth of the essential oils value chain is troubled by several problems. A holistic approach to addressing the entire value chain problem requires the integration of broader group of stakeholders. This coordination and integration approach helps to ensure that all stakeholders support the intervention plan and all those involved in the essential oils value chain take some responsibility for achieving success. Additionally, this provides a chance to coordinate efforts by numerous NGOs and research organizations aiming for similar objectives, communication will ensure that lessons learned are shared, efforts are not duplicated and organizations are not re-inventing the wheel.

Three major interventions are suggested to emphasize development of the essential oils value chain by focusing on creating both a demand pull and a supply push:

- Increasing productivity through improved input usage
- Linking the export market to producers to stimulate quality and supply
- Strengthening the export sector

In general, these interventions represent a cohesive set of actions that can be pursued to strengthen the Ethiopian essential oils value chain. Improving production is key to stabilizing and growing the essential oils value chain, while commercialization provides a demand pull, with the middle of the value chain an enabling mechanism to improve production. Proposed specific interventions in the identified areas are well described below.

Proposals to strengthening business linkages along the value chain

Accurate flow of information, materials and finance with the required level of service support system ensures strong business linkage along the value chain. However, it has been observed that there are challenges which should be addressed to improve the performance of the essential oils value chain in the country. Below are the major interventions suggested to be implemented in order for strengthening the business linkage along the value chain?

Input supply: Leverage existing input supply system (e.g., Agricultural Input Supply Corporation or new entities as necessary, regional research centers etc.) to cultivate, assemble inputs for production in packages for distribution to smallholder farmers (appropriate quantities of seed, seedlings, polyethylene bags and growing practices information). Packages should be easily usable by farmers in various regions addressing the challenge of developing consistent, sufficient input access for producers. This effort should build upon existing research in each region, and link with international research bodies to understand up-to-date technology in other countries to leverage this knowledge.

- Boost research output (knowledge, skills, improved seeds, technologies) dissemination and support service should be strengthened

- Encourage private sectors involvement in seed multiplication, nursery seedlings, nursery polyethylene bag production, packaging materials supply, etc...
- Create strong linkage between farmers and processors; among farmers and service providers and input suppliers
- Increase extension service system and ensure priority for the value chain
- Incorporate essential oils plants production into the extension plans and systems

Improve access to Market information: much has been done to improve market information systems in Ethiopia, particularly through efforts of regional governments. Existing best practice mechanisms should be identified and used as channels to disseminate not only price data, but also other market intelligence data needed to improve linkages in the value chain. Key steps include: collecting and triangulating market information data (e.g., price, demand and supply signals by region) available from different sources (e.g., forecasts from donors, CSA, and regions); developing a simple, standard display of regional price, supply, and demand forecasts so farmers and aggregators can make informed buy and sell decisions; identifying current best practice information delivery channels and disseminating market information data, while simultaneously using the government network periodically, for example, posting data in kebele and woreda offices.

Improve market access through the development of more road networks and storage facilities

Contract farming - link smallholders with agribusiness enterprises through the development of best practice models of contract farming and with the necessary regulatory support. Put mechanisms in place for quality control, largely through the private sector.

- Proposals to strengthening backward linkages with suppliers
- Increase quality Inputs supply to Improve Productivity
- Policy Intervention with respect to education (capacity, training, curriculum designing) and technology development for the Essential oils processing.

Expand essential oils plant variety breeding: the agricultural research centers and institutes should expand their essential oils plants breeding programs starting with bench-marking current essential oils plants varieties in Ethiopia vis-à-vis other countries. This will allow them to leverage existing global farm technology and ensure the essential oils plants germplasm in Ethiopia is the best available. Following bench-marking, agricultural research centers and institutes should adapt and adopt these top varieties for the agro-ecological conditions in Ethiopia, focused the varieties appropriate for export, and suitable for the focus regions.

Increase seed multiplication significantly: to adequately supply and meet the needs of producers who operate on farming and growing of essential oils plants, seed enterprises can begin growing essential oils plants seeds with a guarantee to buy from input suppliers. It is also strongly unions and private sectors would involve in multiplication of seed. Priority should be placed on producing viable essential oils varieties currently “on the shelf” in research centers (e.g., EIAR) but not in the hands of farmers.

Incorporate essential oils into extension - the extension system should incorporate essential oils plants growing into their program, including extension packages for farmers that explain best practice essential

oils plants production and makes the case for farm methodology and improved seed usage. Strong links are needed between EIAR and agricultural extension system in terms of varieties, soil fertility and crop management practices for essential oils plants production

Processors' sustainable raw material access: developing own essential oils plants farming land will be an expansion of investment and thereby it will enable the processor's sustainability of raw material source. Moreover, it will serve as backward linkage between agriculture and the processing sector. It will also help the processors to reduce cost of raw materials. Furthermore, to secure raw materials in desired amount and time, it will be better to follow the principle of contract farming system in raw material purchase.

Improve on-farm and off-farm storage management practices and structures - reduce post-harvest losses from poor storage facilities and management.

Encourage commercialization of essential oils plants products: promoting smallholder and commercial essential oils production.

- Proposals to strengthening forward linkages with buyers
- Improve capacity utilization
- Encourage direct linkage to customers
- Market Development and Expansion
- Develop physical and marketing infrastructure: Devote on promotions works, quality labeling and packaging materials across the value chain must be sufficient.
- Marketing study and product diversification: Invest more on market and product development resource (in collaboration with different research institutions)
- Looking for and networking with better price market destination countries
- Improve the marketing system
- Strengthening of essential oils supply through improving essential oils collection centers, marketing cooperative, provision logistics and breed improvement. In the processing chain quality improvement, business linkages, training, and technology transfer are important activities to be considered.
- Proposals to strengthening horizontal linkages with logistics & other services providers
- Improve the linkage and coordination in the value chains: links among input suppliers, service providers, producers, and actors in the marketing channel. This may improve adequacy of supply of essential oils for domestic, export and processors (in required quality, quantity and time)
- Improve market access through the development of road networks and storage facilities,
- Proposals related to ISO and other quality & standard certification to enter developed and emerging markets

International accreditation: In order to address branding and accreditation issue, the government, concerned development partners and private sectors have to work aggressively to establish and functionalize standard laboratories at national level and also at potential regions.

- Development of national standards and quality requirements for essential oils products
- Awareness creation on importance and impact of producing quality and safety on the production, handling and use of essential oils
- Proposals related to export product development & skilled human resource aspects
- Strengthen export promotion, local and international market intelligence, and the branding of Ethiopian products potentially through exporter association and diplomatic relationships with countries.
- Develop incentives for exporters to invest resources on essential oils plants production, extraction and marketing
- Create strong linkage between exporters and processors or exporters and producers; Incentivize exporters to link with input supply bodies to provide stronger vertical integration in the sector
- Improve business environment to support exporters, making focusing on an environment more conducive to investment (e.g., contract enforcement) and policies aimed at bolstering exporters' scale (e.g., financing for expansion, export promotion/ focus on essential oils, development of risk management tools including potential insurance products).
- Develop a business environment conducive to investment, and policies to scale exporters
- Supply smallholders with input supply
- Ensure value chain governance and ensure transparency while minimizing bureaucratic act by service providers
- Improve access to markets
- Link smallholders with agribusiness enterprises through contract farming; put mechanisms in place for quality control
- Improve on-farm storage management practices and structures

Strengthen and build a dynamic export traders association to build markets, regulate quality and help achieve scale. Supporting the business with the required level and availability of quality infrastructure, which is dedicated to Essential oils, is paramount for export market. Quality equipment such as gas chromatography, liquid chromatography and mass spectrometer are essentially important to detect whether an oil is from the correct genus/species, of inferior quality, or if it is adulterated or contaminated with other, less expensive essential oils, fragrance compounds, plasticizers, or other unwanted components.

Securing skillful human resource

For capacity building, work with the surrounding technical and academic institutions. Furthermore, the value chain should create conducive working condition, attract workers through various incentive packages.

5.8 Conclusions and Recommendations

The findings in this value chain study demonstrated the importance of essential oils as a significant contributor to the economic and social development of Ethiopia. Essential oils have the potential to be a significant driver for smallholder livelihood improvements and economic sustainability for farmers, investor's processors and exporters in Ethiopia. The consistent growth in the demand for exports due to growing interest of natural products in the community, health conscious of the globe and the relatively better proximity of Ethiopia to those importing countries can be an opportunity to substantially boost foreign earnings. Diversification by small-holder producers is an important income opportunity. Increasing production of aromatic plants/herbs can enhance the production of essential oils, ensures to sustain the export market and increase import substitution.

If the interventions are properly addressed on the challenges identified in the study, the country has huge comparative advantage on the production and processing of natural plants for various end products including pharmaceuticals. It is thus important to realize the full potential of the aromatic plants/herbs as a foreign exchange earning commodity, and the country will be benefited from this untouched sector. Development relies on clear direction and execution capacity from GOE and a wide number of concerned stakeholders. To achieve the latent potential of this sector, several constraints must be addressed. A common vision among all stakeholders and the road map to undertake the respective roles of different actors across the value chain is critical and mandatory.

5.8.1 Recommendations

On the basis of aforementioned proposed interventions by the government as well as other concerned stakeholders; the following recommendations are forwarded to be considered by all concerned for future program design, implementation and policy interventions. To meet the growing demand of essential oils, increasing the yield potential with its high-quality parameters would be the solution and demand in the long run. These recommendations are framed in terms of role of government, private sectors and other key stakeholders for their implementation, arranged their sequence of implementation in terms of time scale as short-term, medium term as well as long term.

Recommendation	Role and Responsibility		
	Government	Private sector	Other stakeholders
Short Term			
Awareness creation on commercialization, importance and impact of producing quality essential oils			
Endorse contract farming policy			
Specific agro-ecology selection for essential oil plants production			
Enhance linkages among the value chain actors through establishing and strengthening cooperatives, unions and associations			
Establish national essential oils and associated businesses advisory board, example this sector Indian has guided by national advisory board and brought the sector to be the world leader exporter of essential oil.			
The extension system should incorporate essential oils plants growing into their program, including extension packages for farmers that explain best practice essential oils plants production and makes the case for farm methodology and improved seed usage.			
Increase the awareness and knowledge of producers and farming practices including post-harvest handling, transportation and storage for essential oil bearing plants in order to reduce the postharvest losses of those commodity			
Develop facilities for post-harvest handling of aromatic plants			
Strong links are needed between EIAR and agricultural extension system in terms of varieties, soil fertility and crop management practices for essential oils plants production			
Encourage the use of improved and modern technology with in processing activities			
Facilitate credit access and availability across the value chains			
Medium Term			
Secure raw materials supply in desired amount, quality and delivery time			
Establish national data base on Essential oils plants production, processing and marketing			
Establish essential oils focused national quality infrastructure			
Securing skillful human resource: technical capacity building (work with technical and academic institutions).			
Encourage investors to engage in processing activities by various investment incentives such as providing soft loans			
International accreditation: In order to address branding, traceability and accreditation issue to inter international market, the government, concerned development partners and private sectors have to be integrated and work aggressively to establish and functionalize standard laboratories at national level.			
Market Development and Expansion			
Long Term			
Branding of products			
Processors should involve in secondary processing activities such as cosmetics and pharmaceutical products formulation			
Encourage use of advanced technologies across the value chain of Essential oils			

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ANNEX

Annex 1: Business Model Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
<p>Producers/farmers; Farmers' cooperatives or unions; strategic alliance partnerships, financial institutions, wholesalers; exporters, retailers</p> <p>Motivations for Partnerships: Optimization and economy, Reduction of risk and uncertainty, security input availability, Acquisition of particular resources and activities</p>	<p>Processing, grading, packing, distribution, internal management</p> <p>CATEGORIES:</p> <p>Processing</p>	<p>Essential oils offering; being international,</p> <p>Systematic approach</p> <p>Characteristics: Newness, Performance, Customization, Design, Brand/Status, Price, Cost Reduction, Risk Reduction, Accessibility, Convenience/ Usability</p>	<p>Relationship building through customer service management; Online presence; brand awareness; trust building; product updates;</p>	<p>Hotels, restaurants, essential oils exporters, individual home users/ patients, drug store</p>
	<p>Key Resources</p> <p>Physical resources: cars, machines, buildings, distribution networks.</p> <p>Human and intellectual resources: competent personnel, specialists; knowledge, documentation, patents and copyrights, partnerships, customer information, brands.</p> <p>Financial resources: lines of credit, cash balances</p>		<p>Channels</p>	
<p>Cost Structure</p>	<p>Revenue Streams</p>			
<p>Characteristics: Fixed Costs (salaries, rents, utilities), Variable costs (material, labor, energy), Economies of scale, Economies of scope, taxes, administration costs</p>		<p>Sales of products</p> <p>Licensing/ patent</p> <p>Strategic alliance</p>		

Annex 2: Benchmarking of Ethiopian Essential oil processing with India and Egypt for the Year 2018 (Trend Economy, 2021)

Parameters	Parameters	India	Egypt
Total export value of essential oil	Total export value of essential oil	859,623,137 USD	51,885,954 USD
Total Import Value of essential oil	Total Import Value of essential oil	387,395,124 USD	14,535,798 USD
Total export value of aromatics/herbs	Total export value of aromatics/herbs	307,241,586 USD	111,340,372 USD
Total Import Value of aromatics/herbs	Total Import Value of aromatics/herbs	79,008,849 USD	11,898,238 USD
Processor's capacity utilization	Processor's capacity utilization		
Value additions	Value additions	Essential oil extraction, cosmetics and pharmaceutical formulation	Essential oil extraction, cosmetics formulation
Rosemary	Rosemary	20-55.55	-
Essential oil content for:	Essential oil content for:		
Rosemary	Rosemary	0.35-0.36%	0.54%
Rose	Rose	0.1-0.21%	-
Oregano	Oregano	-	0.35-2.36%
Pepper mint	Pepper mint		0.3%



Chapter Six:

Value Chain Study on Soybean



Executive Summary

Among the golden agricultural commodities, Soybean is one of the high potential export commodities of Ethiopia. Over 210 thousand smallholder farmers produce the crop as cash crop to change their livelihood, with the annual production of more than 0.13 million metric tons. Over 150 commercial farmers engaging in Soybean production produce more than this volume. The overall objective of this study was to conduct the market system analysis of Soybean in Ethiopia. This enables to form a better knowledge on parts of the agriculture and food processing industry sector to attract investments and create jobs.

To achieve the objective stated, the study used standard and scientific methods for data gathering and data analysis process. The major data collection methods and tools included extensive document analysis, in-depth interviews of resource persons, focus group discussions with various relevant organizations experts and distribution of questionnaire to purposely-selected Soybean value chain actors. A mixed analysis approach has employed to come up with the study results.

The trend analysis in Soybean production indicated that there has been a rapidly increasing growth over the last two decades and is expected to continue its upward growth to respond to rising consumer demand. Most of this growth in production was due to an expansion in the area planted, and policy measures taken by the government. National research and Soybean breeding programs, extension supports, improved local varieties, and better yields contributed to the increasing production. Soybean production in 2018 and 2019 has been 149,455 tones and 125,623 tons respectively. Moreover, in 2019/20 and 2020/21, production has been estimated at 132,000 MT and 150,000 MT successively. Soybeans contributing nearly 18 percent to the country's total oilseed or pulses production and account for six % of area planted of oilseeds.

There are about 15 small and medium scale Soybean processors in the country to produce various products. The Government of Ethiopia aims to boost export and trade in agro processing industrial parks (IAIPs) to make Ethiopia a top manufacturing hub on the continent. Integrated Agro- processing Industrial Parks are broadly a key focus of Ethiopia's economic development Strategy, which includes encouraging companies that export value-added agricultural products for domestic consumption. Soybean processed into different products such as milk, tofu, yoghurt, and fruits into jams, grind coffee and nuts.

Soybean local consumption projected to reach 64,000 MT in 2020/21, and expected to continue to grow as consumers now prefer more soy-based edible oil and the poultry sector demands more Soybean feed. Expansion of integrated agro-processing industrial parks and the Launch of new edible oil manufacturing plants will also increase the Soybean demand. Soybean exports forecasted to be 86,000 MT in 2020/21. Exports projected to grow but could still face stiff competition from the local food processing industry, which has witnessed a rising demand for Soybeans. Due to a surge in demand, Soybean export prices and local trading prices at ECX have escalated by 18 and 76 percent, respectively.

The main functions of the Soybean value chain identified in this study, comprising; input supply, production, marketing, processing, and consumption. The key actors include public institutions, the private sectors, NGO's, Farmers' cooperatives, farmers, and traders. Each actor plays a wide range of roles. The study has also asserted that there is big opportunity for the production and processing of Soybean crop in Ethiopia. The domestic consumption demand also increases progressively due to factors including high local demand for vegetable oils and animal feed, the shift of consumers' perception to

become increasingly diet conscious, expansion of integrated agro-processing industrial parks and the launch of new edible oil manufacturing plants are among the others.

However, there are challenges identified in the production, processing and marketing of Soybean. The main limitations are low productivity, unavailability of attractive market for the produce, poor value addition and low linkages among value chain actors. The holistic approach to addressing these bottlenecks includes: improving the Soybean production by using improved production techniques, credit access, promoting contract farming and strengthening extension services are to be done at the backward linkages of the value chain. Moreover, strengthening the value chain linkage, improve market information systems; improve market access, improving process capability, product quality and others.

6.1 Background

Ethiopian agricultural policy and strategy is highly favoring the private sector engagement in production and value addition in larger extent. Parallel with this, Addis Ababa Chamber of Commerce and Sectorial Associations (AACCSA) in collaboration with BAMHA Consulting PLC has decided to undertake the Soybean value chain and market study to investigate the status and trends of production, marketing, processing and consumption of Soybean across the value chain.

This study has been undertaken with the purpose of:

- Generating information that help to understand and evaluate the Soybean trade performance of the country that will enhance well-versed decision for taking measures and activities for Soybean production, marketing and processing in Ethiopia.
- Improve sector productivity and quality through enhanced public and private support in research, input distribution, production, marketing, processing and export
- Improve export competitiveness by strengthening backward production and planning by responding to market opportunities, and
- Strengthen the capacity of key stakeholders to lead the value chain and improve value additions of the commodity.

6.2 Rationale of the Study

Soybean is an annual crop, easy to grow, that produces more protein and oil per unit of land than almost any other crop can grow on all types of soil, but deep fertile loam with good drainage is most suitable for growth (Bekabil, 2015). The main Soybean-producing areas are in the western part of the country in the Oromia, Benishangul Gumuz, and Amhara regions. According to the land suitability analysis of the crop, Soybeans the second among legumes in terms of land area moderately and highly suitable for its production in the country. It covers an estimated land of 42,067,700 (37.2%) hectare, of which Oromia (14.6%), Amhara (6.3%), SNNP (6.2%), Benshangul Gumez (4.2%), Tigray (2.5%), Gambella (1.7%) and Somali (0.87%) regions that contributed about 16.5, 7.2, 7.0, 4.8, 2.8, 1.9 and 1.0 million hectare of land, respectively. This implies low to mid altitude areas of the country are suitable for the crop (Hailemariam & Achamyelh, 2020).

This Soybean value chain study intended to identify and clarify relationships/linkages among the various key Soybean value chain participants including input suppliers, producers, traders, processors, and

marketers, and their relevance to the Soybean industry. The study is designed to address the following major research questions:

- What are the weak links of the Soybean value chain in Ethiopia?
- What can Soybean value chain actors do to enhance the value chain system in Ethiopia?
- What are the key opportunities for various participants across the value chain system?

6.3 Objectives of the Study

6.3.1 General Objective

The overall objective of the project is to conduct the Soybean value chain and market study in Ethiopia that enables to form a better knowledge on parts of the agriculture and food processing industry sector to attract investments and create jobs.

6.3.2 Specific Objective

The Specific objectives of this study are to:

- Analyze trends in Soybean crop including production and consumption,
- Map the value chain and market flow of Soybean crop in Ethiopia,
- Identify the opportunities and challenges across Soybean value chain and
- Propose the possible interventions to improve the performance of Soybean value chain.

6.4 Scope of the Work

The scope of the envisaged value chain would have reviewed and mapped to identify weakness for support at the product, processing, technological, institutional, legal, regulatory, and policy, market, and consumption levels. The scope also includes assessing opportunities, and recommends specific areas with in the value chain having potential benefits for producers and other actors with in the chain and beyond. Following the value chain analysis, the study team identified key areas of opportunity within the value chain and put forward proposals to unlock those opportunities. In particular, the scope of the study relating to products, market potential and improving marketing and chain efficiency is as outlined here below:

Products

- Supply chain of the products
- Linkages between producers, traders, processors and consumers
- Volumes of each product availed in the market
- Value addition, packaging and pricing along the supply chain

- Identifying consumer perceptions
- Estimating the market potential and actors at the end market
- Mapping the characteristics and relationships that exist among supply chain actors,

Market potential

- Determine and establish the market size locally and the share, and estimate the extent of potential market penetration from imports locally,
- Conduct a value chain analysis to identify the constraints (including: access to finance, transportation, warehousing, etc) faced by different actors with regard to marketability of product in the chain and value accrued at different stages on the chain,
- Identify constraints that limit market growth including a thorough reflection of minimum quality standards required by major export markets of the country,
- Identify missing or inadequate crosscutting markets,
- Estimate market potential of the prioritized products with in the value chain

Possibilities for collective marketing and chain efficiency

- Identify/establish the existence of any producer groups for the various products,
- Determine the extent of market orientation and market integration by producers,
- Assess the importance and potential for improving market efficiency through collective marketing perspective for the product(s) prioritized,
- Suggest improvements in the value chain system to ensure direct linkages of the community living around major production zones/areas with the major markets to help them generate increased incomes from their produce.

6.5 Methodology

6.5.1 Data Sources and Types

To achieve the objectives stated and perform all the tasks specified, the consultant used both secondary and primary sources of data. Standard and scientific methods employed for data gathering and data analysis. The major data collection methods and tools included extensive document analysis, in-depth interviews of resource persons, and selected focus group discussions with various organizations experts considered under this study. To this end, the secondary data sources collected from various internal and external organizations including Central Statistics Agency, Ministry of Agriculture, Ministry of Finance and Economic Development, Ethiopian Agricultural Research Institute, Ethiopian Ministry of Revenue, Ethiopian Custom Commission, Ministry of Trade and Industry, ECX, ITC, TRADE MAP, COMTRADE, International organization Data Base, FAOSTAT, EPOSPEA, and other relevant sources.

6.5.2 Data collection tools and sampling

To collect primary data, purposive multi-stage cluster sampling technique employed. The data collection techniques employed were questionnaire, interview, focus group discussions, key informant interview and observation as explained hereunder.

The primary data was collected by using a small sample based study, rather than a large-scale survey because of time shortage and limited resources. Accordingly, target company managers and experts in the area interviewed, for in-depth understanding and analysis of the subsector. Similarly, officials and experts from relevant government organizations, associations, researchers who have demonstrated interest and experience in the subsector interviewed.

In addition to individual interviews, focus group discussions conducted to explore concepts, generate ideas, determine differences in opinion between stakeholder groups who were engaged in similar activities and triangulate with other data collection methods. The group discussion was made by limited people consisted of 3-4 people due to COVID-19. The group discussion guided with prepared checklist to capture the social interaction and spontaneous processes that inform decision making, which is often lost in structured interviews.

6.5.3 Data Management and Analysis

After collection of relevant data from various relevant sources by using various data collection instruments, the data analyzed quantitatively and qualitatively.

Quantitative analysis of the sector conducted to provide a picture of the current situation in terms of the distribution, value-addition, profitability, productivity, production capacity and marketing. Analyzing these factors highlighted the potential inefficiencies in the subsector.

Qualitative analysis: Information collected through key informant interviews, rapid observation and focus group discussions qualitatively analyzed. Qualitative content analysis and thematic analysis used for interpreting the qualitative data collected from FGD, Interview and Key informants. The content analysis used to evaluate patterns within a piece of content or across multiple pieces of content or sources of communication. Thematic analysis looks at patterns of meaning in a data set - for example, a set of interviews or focus group transcripts i.e. thematic analysis takes bodies of data and groups them according to similarities.

6.6 Discussions and Major Results

6.6.1 Economic Importance of the Soybean Value Chain in Ethiopia

i. Existing and established processing plants and businesses

Soybean the most prominent oilseed crop in the world and possess a wide range of industrial applications both is the human and animal feed industry, which is accounting for 55% of global oilseed production. Ethiopia's staggering potential of over 2 million tons and huge impact of Soybean on household food security and nutrition, current annual production remains low at 67 thousand tons per year. A large number of small scale and commercial farmers are switching to soy because of improving

economics, soil fertility and low fertilizer requirement (Sopov & Sertse, 2014). In Ethiopia in 2019/2020, the production of Soybean crop significantly different from region to region. Amhara, Beneshangul Gumuz, and Oromia produced 48, 31 and 18 percent respectively. Table 1 below clearly shows the production trend:

Table 1: Soybean Production Trends across major producing region

Year	Region	Number of Holders	Area (in Hec)	Production (In Qts)	Yield (Qt/Hec)	% share from National production
2019/20 (2012 E.C)	Amhara	84,613	24,478.01	608,233.69	24.85	48.4173
	Oromia	47,900	10,269.29	232,036.68	22.60	18.47085
	Benishangul-Gumuz	47,776	18,514.04	397,734.70	21.48	31.66093
	S.N.N.P.	25,456	1,098.41	16,437.39	14.96	1.308468
2018/19 (2011 E.C)	Amhara	50,410	*	614278.5	*	41.10134
	Oromia	33,543	*	444036.7	*	29.71048
	Benishangul-Gumuz	38,845	19,671.99	416,300.27	21.16	27.85463
	S.N.N.P.	24,267	1,476.28	19,929.86	13.50	1.333506
2017/18 (2010 E.C)	Amhara	58,688.00	*	340,412.03	*	39.36862
	Oromia	50,677.00	9,611.04	223,006.99	23.20	25.79074
	Benishangul-Gumuz	26,931.00	14,076.52	300,939.73	21.38	34.80365
	S.N.N.P.	9,050.00	-	*	*	0
2016/17 (2009 E.C)	Amhara	40,890.00	13,677.21	314791	*	38.75082
	Oromia	46,516.00	8,801.93	202582.8	*	24.93798
	Benishangul-Gumuz	30,748.00	13,946.74	292,274.22	20.96	35.979
	S.N.N.P.	11,585.00	209.28	2,684.09	12.83	0.330412
	Gambela	284.00	0.63	14.49991	*	0.001785
2015/16 (2008 E.C)	Tigray	2,037.00	*	398.40	*	0.049038775
	Amhara	28,473.00	10,308.15	233,094.86	22.61	28.69148213
	Oromia	61,300.00	14,626.78	318,326.11	21.76	39.18253666
	Benishangul-Gumuz	31,248.00	12,806.00	256,408.20	20.02	31.56110473
	S.N.N.P.	17,170.00	375.79	4,190.76	11.15	0.515837697

Source: CSA-Ethiopia, Various years

The Government of Ethiopia (GOE) aims to boost exports and trade in agro processing industrial parks to make Ethiopia a top manufacturing hub on the continent. Integrated Agro-processing Industrial parks broadly are a key focus of Ethiopia's economic development strategy, which are including companies that export value-added agricultural products as well as those producing products for domestic consumption. Among the major agriculture processing potentials in the agro processing industrial parks are cattle fattening and processing, chicken production and processing, livestock feed manufacturing, wheat-based food production (e.g. pasta, biscuits), sesame processing (e.g. tahini), Soybean crushing (e.g. Soybean oil and feed) (Ethiopia Commercial Guide: <http://www.ipdc.gov.et/index.php/en/>). In

addition, Soybean can have processed into different products such as milk, tofu, yoghurt, and fruits into jams, grind coffee and nuts, therefore offers the possibility for product diversification for the micro-enterprise of Soybean producers and users (Sopov & Sertse, 2014).

FAS (2021) reported that oilseeds production in Ethiopia expected to increase to meet the growing demand for cooking oil and livestock feed in the country. The inauguration of Integrated Agro-Industrial Parks and entry of large-scale edible oil complexes in the market will offer new opportunities to process this anticipated increase in oilseed production including Soybean. This suggests that cooking oil imports could thus decline in the future. In February 2021, PhiBella Industrial Complex, Ethiopia's largest edible oil facility, began production of refined palm oil. The edible oil plant has capacity to produce 1,500 MT of cooking oil per day. The full production should cover 60 percent of Ethiopia's demand for cooking oil. In addition to the recently inaugurated edible oil complex, there are a couple of other large-scale edible oil plants under construction. When all factories become operational in a few years, the country is likely to substitute cooking oil imports more with local production and in the long-term, it should drive increased production of oilseeds. Furthermore, several other edible oil complexes expected to commence productions. This expansion in agro-industries and edible oil processing is projected to reinforce oilseeds production locally (Soybeans, sunflower, sesame seed, and Niger seed) in the longer term, but as current production of oilseeds is not sufficient (<https://www.capitalethiopia.com/capital/the-urgency-for-crude-palm-oil/>).

According to Ethiopia's Ministry of trade and industry (MOTI), there are about 15 small and medium scale Soybean processors in the country to produce various products.

ii. Soybean Processing

Processing Soybean through various steps in to the diversified products. The raw materials driven from the field are initially passed through admission control (proteins and oil contents, moisture, dirt and so on). The beans received first classified according to their moisture contents. Then coarse dirt removed from the beans, they dried to the optimum moisture content and stored in silo for a longer period with proper storage conditions. At the beginning of the processing phase, the beans subjected to another phase of coarse and fine cleaning. In order to facilitate de-hulling, beans dried again and conveyed to the preparation plant. The beans are then crushed, the husk separated and the beans conditioned (steam-heated) and passed through large rollers that give them a flake-like form. In the preparation plant, raw material separated into the parts going into the production of full-fat products and those going into extraction. The major one is soy cake (curd residue). Currently, the soy cake has comparable selling price with wholesalers' (ECX) Soybean value. According to this study, the existing industries are operating under capacity.

About 50 % and 20 % of sample respondents said that they are currently working below 50% and 55% of their design capacity respectively. They strongly outlined that insufficient raw material supply, power shortage and discontinuity; high prices of raw materials, usage of outdated processing machine are the main reasons for their under-utilization. Moreover, 67% and 33% of them rated the current value addition practices along the Soybean supply chain actors as moderate and low respectively. The major challenges they face in creating value addition in Soybean product are limited direct linkage between farmers and processors, limited availability of Soybean, low quality and quantity of raw material, high capital investment cost, and tiresome government bureaucracy.

Furthermore, raw material shortage, lack of capital and skilled workers, lack of awareness on business, limited value addition practices mentioned as the major constraints to entry in Soybean market (licensing procedure, capital, skill etc...). Equal percentage (30%) of the respondents gave their opinion that investment in value addition and incentives for value addition practices is low respectively (Table-2). In the same way, 30% of the respondents replied availability of finance for new investment, expansion, and working capital is low

Table 2: Soybean production and processing rating based on some actors

Criterion /rate	Low	Average	High
Availability of packages	10%	70%	20%
Availability of Inputs	50%	20%	30%
Availability of finance (new investment, expansion, and working capital)	30%	40%	30%
Investment in value Addition	30%	50%	20%
Incentives for value addition practices	30%	40%	30%

Source: Own Survey

iii. Trend comparison of Ethiopia’s Soybean production and processing with other African countries

The average national production of Ethiopia is 84,931.42MT, and the smallest producer is Madagascar, whose three-year production average is 40.33 MT Global average yield per hectare is 41 bushels per acre, while African producers produce less than half the yield at 19 bushels per acre (Figure 4). Egypt, using irrigation, leads all of Africa in terms of average Soybean yield at 48 bushels per acre, while Ethiopia and Zambia, the number two and three yield leaders 33 and 27 bushels per acre, respectively. South Africa, Africa’s Soybean leader, averages 26 bushels per acre. Yields remain below 15 bushels per acre for 15 of the 24 African countries for which data exist. Generally, Africa remains a minor player within the global Soybean production value chain. Levels of production and growth rates in yield are low. Total Soybean supply presents a minimal effect on global markets.

iv. Soybean domestic consumption patterns and trend in Ethiopia

The main end-users of Soybeans in Ethiopia are agro-processing industries engaged in human and animal feed. The World Food Program (WFP) is the principal buyer of soy products, mostly in the form of Corn-Soy-Blended food, for emergency prone areas. Despite a huge potential for household utilization and therefore food/nutrition self -sufficiency, less than 5% of the produce utilized at this level. Of the different factors that contributed to low household utilization are limited awareness about the value of soy food, lack of access to small scale processing technologies, and lack of knowledge about soy home-economics (cooking methods)(Sopov & Sertse, 2014). Edible oil consumption in Ethiopian fiscal year 2020/21 projected at 630,000 MT, of which 90 percent is imported. Most of the oil consumed is palm oil, followed by sunflower oil and locally produced Niger seed oil. Small amounts of Soybean, linseed, groundnut, and cottonseed oils also consumed. With increasing demand, limited domestic production and the country’s heavy reliance on imported oil, there have been supply shortages especially in urban areas. In addition, as some consumers become increasingly diet conscious, they are looking for healthier alternatives to palm oil. There is an increasing demand towards alternative edible oils containing non-

saturated oils and fats. Most Ethiopian consumers prefer sunflower, Niger seed, and Soybean oils as healthier alternatives, and due to these changes in consumer preferences, consumption of sunflower oil has almost tripled over the last couple of years; palm oil has dropped considerably. Therefore, Soybean consumption expected to continue its increasing, as consumers demand more soy-based edible oil as well as the poultry sector also demands more Soybean meal. Expansion of integrated agro-processing industrial parks and the launch of new edible oil manufacturing plants will also expand Soybean demand. In addition to oil, Soybeans used to make a variety of local foods, as well as corn-soy blend for emergency food assistance programs (FAS, 2021).

v. Trade: Export and Import Trends and Potentials

Ethiopia currently exports Soybeans to the European Union at average world price. Export prices went down in the observation period of 2013–2017, most likely due to better production because of more favorable weather conditions. This price is competitive with main suppliers Brazil, the USA and Paraguay. The lack of yield in comparison with these competitors compensated most likely by lower labour costs. In the five-year price averages from India to the EU, one can appreciate that the premium for organic is almost non-existent. As most Soybeans by volume go into animal feed production, the incentive to pay for organic is probably not high; however, there is also a chance that this situation is an artefact related to the specific trade from India to the EU (Lehr & Sertse, 2018).

Table 3: Annual Trend of Ethiopia’s Soybean Exports by Marketing Year (October- September)

Year	Volume (MT)	Value (in thousands USD)
2010/11	1,380	656
2011/12	2,569	1,570
2012/13	33,839	18,831
2013/14	36,630	20,473
2014/15	28,517	13,177
2015/16	74,555	31,606
2016/17	41,234	17,750
2017/18	88,803	41,477
2018/19	122,642	61,101
2019/20	75,670	44,881
2020/21*	86,000	-

Sources: Trade Data Monitor and FAS Addis Ababa

Notes: Export volume for 2020/21 is an estimated figure.

In 2020/21, Soybean exports forecasted to be 86,000 MT (Table 3). Exports projected to grow but could still face stiff competition from the local food processing industry, which has witnessed a rising demand for Soybeans. Due to a surge in demand, Soybean export prices and local trading prices at ECX have climbed by 18 and 76 percent respectively, since the start of the current marketing year in October 2021 (Figure 1).

As it well presented in Table 4, India is the largest destination market for Ethiopia’s Soybean export, accounting for about 52 percent of the total exports in 2019/20. Vietnam, Turkey, and China are the next

important destinations, with respective market share of 13, 10, and 7 percent of total exports. During the previous marketing season, China bought 5,000 MT of Ethiopian origin Soybeans valued at \$2.5 million. In 2019/20, Chinese import demand for Ethiopian Soybeans rebounded after imports slumped in 2018/19. A record level of 23,000 MT of Soybeans shipped to China during 2017/18, following the U.S.-China tariff retaliatory actions.

As the information obtained from different stakeholder's interview, the MOTI has a directive on registration and administration of export contracts to go into effect as of October 2019. This MOTI regulation require Soybean trading conducted through the ECX, and trading at ECX officially started in January 2019. Recently, local food processors have a special window to purchase Soybeans for local processing.

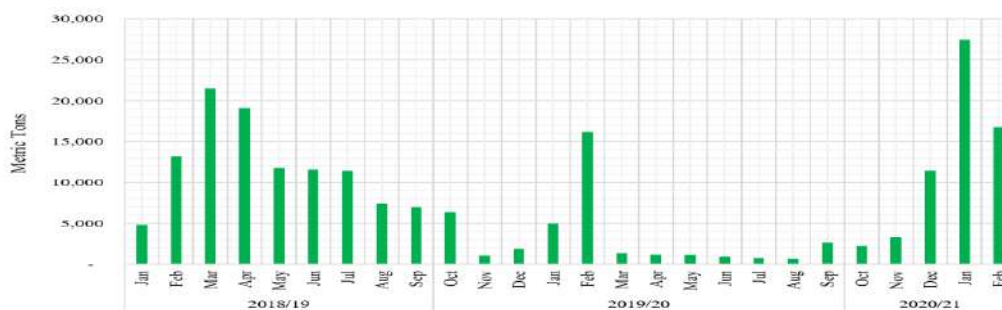
Table 4: Ethiopia's Soybean Export Destination in 2019/20 (October-September)

Partner	Export		Market Share	
	Volume (MT)	Value (in thousands USD)	Export Volume (%)	% Change (2020/2019)
India	39,228	18,936	51.8	-62.2
Vietnam	9,769	4,799	12.9	2,306.10
Turkey	7,330	3,788	9.7	262.1
China	4,998	2,475	6.6	351.9
Singapore	4,823	5,223	6.4	434.7
Israel	3,270	4,935	4.3	274.1
United Arab Emirates	2,156	2,358	2.9	-28.7
Canada	1,412	671	1.9	0
Spain	660	341	0.9	-87.5
United States	660	325	0.9	0
Sub-Total	74,306	43,851	98	3,451.00
Other	1,364	1,030	2	-3,489.00
Total	75,670	44,881	100	-38.3

Source: Trade Data Monitor

This regulation expected to drive up local production, streamline trading, and improve exports. Since then, the directive has enabled Soybeans price at ECX market to stabilize and go below export price. Moreover, local prices expected to continue an upward swing owing to strong demand for the beans in domestic and overseas markets.

Figure 1: Soybean Traded Volume at ECX; Source: ECX as cited by FAS



Source: ECX as cited by FAS

Table 5: Import and Export of Soybean Seed

Year	Export			Import		
	Value (USD)	Volume (KG)	Major Country of Destination	Value (USD)	Volume (K.G)	Major Source
2014	18,790,159	31,328,094	Vietnam	40,130	1,342	
2015	13,885,169	30,716,884	India	13,143	8,063	China
2016	30,729,094	71,779,100	India	1,850	640	China
2017	21,871,414	49,567,400	India	12,990	3,891	Zambia
2018	24,559,826	50,244,190	India	17,981	2,635	China
Average (2014-2018)	13,068,058	27,064,196	-	17,219	3,314	
Average (2016-2018)	25,720,111	57,196,897	-	10,940	2,389	

Source: Ethiopian customs commission

In the year 2014 through 2018, Ethiopia has exported 27.06 tons of Soybean on average with an equivalent amount of 13.07 million USD earned (Table-5). The trend has shown an overall growth in the export of the commodity. The relatively recent three years (2016-2018) average export value also indicates that there is an increase in the export value of the Soybean seed broken or not. The average export value for the three years has been recorded about 57.2 tons and equivalently 25.72 million USD. On the other hand, the data from Trade data monitor (Table-5) has indicated there has been about 75,670 MT exported in the year 2019/2020. India has been the major destination country for the years (2015-2018) while Vietnam has also been the export destination country in the year 2014.

On the other hand, Ethiopia has imported 3,314 kg of Soybean commodity on average in the year (2014-2018) and spent an average value of 17,219 USD in the same years. The Soybean import trend has indicated that there is an overall decrease from time to time though erratic rain fall pattern experienced. The relatively recent three-year average import has shown that there is a decrease in import volume of Soybean that was 2,389kg and an equivalent value of 10,940 USD. The major countries of origin for the Soybean import were China and Zambia in the years considered.

Table - 6 shows breakdown of oil imports by volume and value. Imports of edible oil have been rapidly increasing with an average annual growth rate of a little more than 10 percent for the period covering

2014 to 2018. In fiscal year 2019/20 (July to June), Ethiopia imported palm oil, sunflower oil, and Soybeans oil valued at nearly \$283 million. Of this imported edible oil, about 71 percent by value was palm oil, followed by sunflower oil (27 percent) and Soybean oil (1 percent) (FAS/Addis Ababa Staff, 2021).

Table 6: Annual Edible Oil Import Volume and Value: July to June

Commodity	Volume	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Palm oil	Volume (MT)	348,561	409,711	466,806	446,620	488,824	513,027	322,659
	Value (USD)	374,517	413,097	429,081	434,563	476,967	399,238	200,015
Sunflower Oil	Volume (MT)	3,426	5,125	10,605	25,435	50,571	53,838	74,822
	Value (USD)	5,862	8,620	16,588	36,939	51,654	52,989	77,779
Soybean Oil	Value (USD)	2,647	3,327	9,161	5,303	5,155	3,343	5,593
	Volume (MT)	4,135	4,529	11,129	6,014	5,616	3,087	3,130
Total	Volume (MT)	356,648	420,178	488,588	479,375	546,568	572,227	405,094
	Value (USD)	386,528	428,261	458,814	479,533	536,255	457,333	282,944

Source: Trade Data Monitor

Notes: Annual import figures based on Ethiopian fiscal year starting in July and ending in June.

Table 7 clearly shows that oil imports by country of origin for the year of 2019/20. Ethiopia imports palm oil mostly from Indonesia (48 percent) and Malaysia (36 percent). On the other hand, the largest suppliers of sunflower oil to the Ethiopian market are Turkey (58 percent) and Ukraine (21%) while the leading suppliers of Soybean oil are Ukraine and China (market shares of 33 and 26 percent, respectively).

Policy wise, Ethiopia subsidizes edible oil imports to make it affordable to the majority of the Ethiopian population. The edible oil sector is also highly regulated sectors where the country controls price and caps selling prices at local market. Recently, Ethiopia reduced import duties and taxes to minimize the economic effects of COVID-19 on consumers and to manage food price inflation, and a five percent tariff is currently in effect for edible oil imports. The country is encouraging investment in the edible oil-manufacturing sector to expand productions and substitute imports with local production. Since last year, Ethiopia has permitted local and foreign companies to import and supply food commodities, including edible oils, to the local market using the companies' hard currencies.

Table-8 indicates the export and import trend of Soybean processed products in the five consecutive years (2014 -2018). The average volume of Soybean flours and meals in the years is 812,591 kg and the country has earned 384,906 USD. The relatively recent three years (2016 -2018) average export value also indicates that there is a subtle decrease in the export value of flours and meals of Soybeans product with amount of 682,984 kg and equivalent value of 309,087 USD .The reason that the slight

decrease in the export volume of flour and meals of Soybean has perceived as the increment of domestic consumption.

Table 7: Ethiopia's Major Edible Oil Imports by Trading Partner July 2019- June 2020

Edible Oil	Partner	Market Share	
		Value (in Million USD)	Percentage
Palm oil	Indonesia	95	47.5%
	Malaysia	71	35.5%
	Djibouti	29	14.5%
	Others	5	2.5%
	Total	200	100.0%
Sunflower oil	Turkey	45	57.7%
	Ukraine	16	20.5%
	Egypt	7	9.0%
	Others	10	12.8%
	Total	78	100.0%
Soybeanoil	Ukraine	1	33.3%
	China	0.788	26.3%
	Egypt	0.616	20.5%
	Others	0.596	19.9%
	Total	3	100.0%

Source: Trade Data Monitor

On the other hand, Import of Soybean flours and meals has shown slight growth. The country has imported 760,748 kg of Soybean flours and meals on average in the years (2014-2018) and spent an average value of 354,578 USD. The relatively recent three-year average import has shown that there is a slight increase in import volume of Soybean flours and meals that was 769,389 kg and an equivalent value of 359,633 USD.

The major countries of origin for the Soybean import were Chain, Belgium and Turkey in the years considered.

Table 8: Soybean flours and meals of Soybeans

Year	Export			Import		
	Value (USD)	Volume (kg)	Major Country of Destination	Value (USD)	Volume (kg)	Major Country of source
2014	\$315,257	626,000	Viet Nam	\$384,906	812,591	China
2015	\$682,009	1,388,000	Sudan	\$309,087	682,984	China
2016	\$496,621	1,048,000	Sudan	\$384,906	812,591	China
2017	\$159,392	400,953	Sudan	\$309,087	682,984	Belgium
2018	\$271,249	600,000	China	\$384,906	812,591	Turkey
Average (2014-2018)	\$384,906	812,591	-	\$354,578	760,748	
Average (2016-2018)	\$309,087	682,984	-	\$359,633	769,389	

Source: Ethiopian customs commission Source: Ethiopian customs commission

6.7 Analysis of the Soybean Value Chain

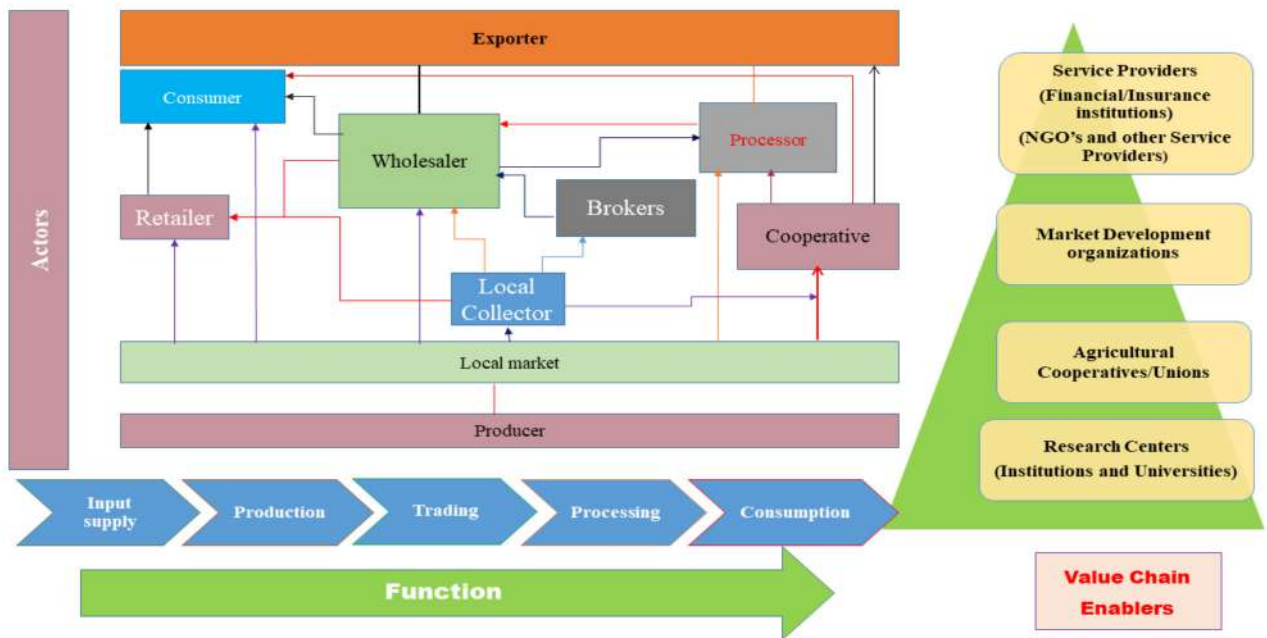
i. Value Chain Map

Mapping the value chain of the product or commodity used to analyze the value chain, understand the characteristics of the chain actors, their link to each other, and the flow of production through the chain. This information obtained by reviewing literature, conducting focus group discussion and interviews as well as by collecting secondary data from various sources.

The Soybean value chain extends from pre-production (supply of inputs) to processed products marketing and consumption while many actors embedded in it. The main functions of the Soybean value chain identified in this study, in their logical sequence, are input supply, production, commodity marketing, processing, and consumption (Figure 2). Under these core functions, actors broadly classified into four, namely inputs suppliers, processors, direct market actors and chain supporters. Major actors who involved in input supply functions are farmers, private dealers, NGOs, agricultural research centers, unions, primary cooperatives, woreda offices of agriculture. They mainly supply inputs like fertilizers, seed, and others (such as credit, insecticide, pesticides etc) whereas; processors along the value chain mainly operate the value addition. These actors are processing firms, which converts the agricultural Soybean commodity into variety of processed products while adding value.

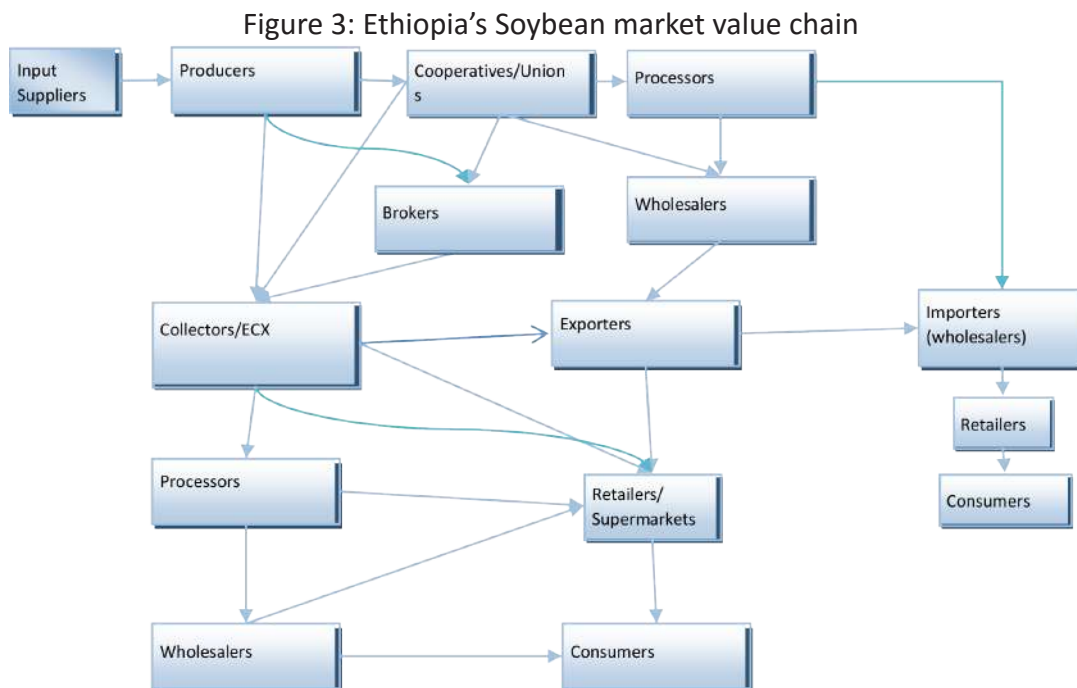
The direct market actors are, those involved in Soybean trade, who order the flow of Soybean in time and space. These include producers, local collectors, primary cooperatives, unions, wholesalers, processors and consumers. The chain supporters are involved in technical advice, service provision and policy formulation and implementation of the chain. The technical advice like extension services and marketing information along soybean value chain provided by development agents, bureau of agriculture, agricultural research center and NGOs. The map would tell us the major crop destination within the soybean value chain in Ethiopia representing key players' that are engaged in input delivery, technology supply, production, transporting, Trading, warehousing, value addition, export/import actors including soybean bean consumers. The value chain map clearly portrait each actor's contribution and roles towards the sub-sector.

Figure 2: Soybean Value Chain Mapping



ii. Market flow Map

Soybean traded as agricultural commodity and variety of processed Soybean products. The direct market Soybean traded as agricultural commodity and variety of processed Soybean products. The direct market in which farmers sell their produce directly to local collectors, processors, exporters, unions and ECX. These would be the major market for Soybean from the farmer’s hand. The collectors, unions and ECX participate in selling Soybean commodity to exporters and processors. The raw commodity can have exported while keeping international market requirements. The processors perhaps receive their input directly from the farmers’ collectors, ECX or unions and supply to local and export market as depicted in figure 3.



Sample respondents considered under this study have showed that diversified marketing channel for Soybean production and processing. Accordingly, 33.33% of the respondents answered that they follow Farmer→Broker→Wholesaler→Processor→Consumers Soybean marketing channel. The same percentage of the respondents replied that they follow Farmer→Rural Collector →Retailer →Consumer Soybean marketing channel.

a) Operational actors and their functions

As shown in Figure 2, the number of actors at each function of the value chain is large. These actors include public institutions, the private sector, NGO's, Farmers' Cooperatives or Unions, household farmers, commercial farmers and associations. Each actor plays a wide range of roles. An overview of the value chain and the roles of the different Soybean value chain actors are shown under figure 3 above.

Local Collectors: It is the first link between producers and other traders. According to Bezabih (2010), these are small trading individuals who collect the product in small quantity directly from producers and resell to brokers/wholesalers, oil millers and exporters in a more marketable quantity. They act as intermediaries who do not add value but merely snatch the benefit that could have accrued to the producers.

They use their financial resources and their local knowledge to bulk Soybean from the surrounding area. They play important role and they do know areas of surplus well. Collectors are the key actors in the Soybean value chain, responsible for the trading of Soybean from production areas to wholesale and retail markets.

Farmers: The initial value adding activities carried out by farmers who produce Soybean crop and supply to the next level in primary market. Individual householders and private commercial farmers participate in Soybean production. The Soybean farmers are largely located in Amhara, Benishangul Gumuz and Oromia regions.

Processors: Next to farmers, processors are the main value addition actors along the value chain. The Soybean processing companies convert the Soybean commodity into variety of industrial products such as edible oil, protein rich food items, and animal feed concentrates.

Wholesalers: They are larger suppliers who have better capacities in terms of finance and other facilities. They provide both price information and advance payments for selected reliable clients. They have better storage, transport and communication access than other farmers and other suppliers.

Retailers: Retailers are also important primary actors in the Soybean value chain in the study area. Either their duty is to buy the product from primary producers, or buy the product from wholesaler. Then, by sorting and packing, they sell raw Soybean to nearby consumers.

Union and Cooperatives: One sales outlet of the small-scale farmer is the cooperatives and unions. Unions collect Soybean from each farm household through their member cooperatives. The cooperatives in turn collect the Soybean mainly from their member farmers. The unions store and clean the Soybean and look for export sale outlets. The unions prefer to participate in the ECX marketing framework as buyers rather than as sellers. This is because they have developed the necessary financial

and organizational capacity to export. The government and/or concerned governmental organizations are doing their best to encourage unions to undertake high-value addition activities, including export and import of commodities and inputs.

Exporters: The major operator in the Soybean market is the exporter. These are the largest buyers of Soybean from the wholesalers. These large-scale exporters, mostly located in Addis Ababa, have their own buying branches. These buyers buy most of the exported Soybean using different instruments. They buy on the spot market, on cash from anyone willing to sell, competing merely on prices.

Supporting Actors: Such actors are those who provide supportive services including training and extension, information, financial and research services. Access to information or knowledge, technology and finance determines the state of success of value chain actors, micro finance, NGOs, Agricultural development offices and Trade and Market development office and others are main supporting actors who play a central role in the provision of such services.

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iii. Business Model Analysis

The term business model refers to a company's plan for making a profit. It identifies the products or services to sell, target market, and any anticipated expenses. Business models are important for both new and established businesses. They help new; developing companies attract investment, recruit talent, and motivate management and staff. Established businesses should regularly update their business plans or they will fail to anticipate trends and challenges ahead. Business plans help investors to evaluate companies that interest them.

a) Price Build Up in The Export market

Marketing of Soybean starts from production areas moving on to the end-users. Based on the direction of flow and volume of Soybean transacted and purpose of price build for both domestic and export market, producers, local collectors, wholesalers, retailers, and exporters identified as major value chain actors. The price builds up for a quintal of Soybean, starts with 3000 birr with price mark up for brokers and collectors at the primary and secondary market. It will become 3000-3500 birr per quintal (which is around 0- 500-birr price mark up from the producers) and this will end up with 2851.77, and 3800 birr/ quintal of Soybean export and Soybean cake export respectively, as illustrated on the Table 9. The estimation price at market places is done based on marketing survey (field and online) conducted by study team.

Table 9: Export Market Price Make Up for Soybean in ETB (2019/ 2021)

No	Value Chain Actors	Average Price marks (per quintals in Birr)
1	Producer/Farmers	3000
2	Local Collectors (small traders, cooperative and union)	3000 - 3500
3	Wholesalers (ECX)	3800 - 4000
4	Soybean Export	2851.77
5	Soybean cake Export	3800

Source: own survey

b) Price Build up in the Domestic Market

The prices make up and mode of bargaining on the domestic market along the value chain is through marketing survey conducted by study team.

Table 10: Domestic Market Price Make up for Soybean in ETB

No	Value Chain Actors	Average Price marks
1	Producer/Farmers	2500 - 2700 birr / Quintal
2	Local Collectors (small traders, cooperative and union)	2800 - 3000 birr / Quintal
3	Wholesalers	5800 – 6000 birr / Quintal
4	Retailers	7000 birr / Quintal
5	Soybeanoil oil Producer	110 birr / liter
6	Soybeanoil Distributor	126.5 birr / liter
7	Soybeanoil Retailer	130 birr / liter

Source: Own Survey

6.8 Opportunities and Challenges to Soybean

6.8.1 Opportunities

Based on study team’s literature review, survey, focus group discussion and key informant interview with different value chain actors, the following major opportunities for value chain actors in Soybean production and processing activities identified.

A. Production and processing

i. Availability of adequate land and biodiversity for cultivation

Strong government commitment and support: Plans for increasing production for processing and export market. Currently, the government is promoting self-contained plan to create modern marketing system (cooperatives)

Different value additions alternatives: Oil, protein concentrate, ground flour, soymilk and Cake or animal feeds. Processing Soybean has greater advantage over Soybean row commodity as the value addition process attributed with diversified products and by products and it creates job opportunity for citizens.

Organic output: Soybeans is one of the most important commodities traded worldwide. The same is true for their derivatives Soybean oil, meal and cake. Ethiopia GMO-

Free, which might provide it with a competitive advantage, as confirmed by interviews with European importers.

Availability of different input suppliers: Agricultural Input Supply Enterprise is the Sole importer of fertilizer. Distribution is through unions and cooperatives. Private companies supply Agro chemicals. Ambasel and Chemtex are the major importers and suppliers of chemicals.

- Availability of extension services
- Adequate labor force for Soybean production and processing activities
- Availability of research centers /institutes
- Availability of different NGOs that promote the production, processing and marketing.
- Available of cooperatives and Unions
- Availability of local processors
- Domestic consumption demand
- High internal demand for vegetable oils and animal feed
- A huge potential for household utilization and therefore food/nutrition self-sufficiency

Consumers become increasingly diet conscious, they are looking for healthier alternatives to palm oil. There is an increasing preference towards alternative edible oils containing non- saturated oils and fats. Most Ethiopian consumers prefer sunflower, Niger seed, and Soybean oils as healthier substitutes, and due to these changes in consumer preferences, consumption of sunflower oil has almost tripled over the last couple of years; palm oil has dropped considerably.

ii. High demand of Soybeans in Ethiopia by agro-processing industries engaged in human and animal feed

Expansion of integrated agro-processing industrial parks and the launch of new edible oil manufacturing plants will also expand Soybean demand. In addition to oil, Soybeans used to make a variety of local foods, as well as corn-soy blend for emergency food assistance programs

iii. Processing potential demand /Demand of products by processing

- High demand of Soybeans in Ethiopia by agro-processing industries engaged in oil, food and animal feed. In addition to oil, Soybeans used to make a variety of local foods, as well as corn-soy blend for emergency food assistance programs.
- Expansion of integrated agro-processing industrial parks and the launch of new edible oil manufacturing plants will also expand Soybean demand.
- Processors are allowed to buy Soybean from ECX with special privilege
- High demand for processed Soybean products on international markets
- Infrastructure development could facilitate Soybean marketing by create a link between buyers and farmers
- The existence of supportive government policies and strong government commitment which backings small scale businesses was another opportunity for farmers of the districts

6.8.2 Constraints in Soybean Value Chain

Different constraints influence the development of the Soybean value chain across the country. Based on document review, survey, focus group discussion and key interview with different value chain actors, some of the major constraints that influence the value chain actors identified and described as follows.

6.8.3 Challenges facing the supply market

Although Soybean breeding and production have been going on in Ethiopia since the 1950's, it was not easy to achieve wider dissemination and production of the crop. The main limitations were lack of knowledge of the local farmers on the utilization aspect of the crop, unavailability of attractive market for the produce, and lack of systematic approach in popularizing the crop, which emphasized training farmers on the production of Soybean, its utilization, and market potential. Consequently, the land allotted for growing Soybean in the country has been limited for several years.

Moreover, with respect to regulatory framework, respondents also evaluate the regulatory polices whether it is favoring or hindering the Soybean business sector. Accordingly, 10%, 60% and 30% of the respondents said that the existing regulatory policy is favorable, it but requires upgrading, and hindering respectively. For improving policy framework, they recommended that increase land for commercial Soybean production, policy improvement especially export; provide different support for soya processor in the country. In terms of administrative, they suggested that expanding large-scale farming in Soybean, uniform the regulation through regional, smoothening the bureaucracy. For provision of further incentives to encourage investments in the sub-sector, they suggested that encouraging large reliable agro-investment, improve incentives (introduce more incentive packages) to those engaged in processing activities. The following are also problems that are attributable to low level of Soybean production and supply in the country.

Input related constraints: Limited use of improved varieties. Though increased productivity cannot have associated with purely to research, the contribution of research outputs in terms of improved varieties and associated agronomic practices takes the lion share improvement. Specifically, the following are major constraints in input supply.

- Limited availability and use of improved seeds
- Limited use and access of chemical fertilizers
- Limited credit availability and access, and collateral problem for accessing loans

Production Constraints:

Limited knowledge in use of Soybean in cropping system

Low productivity: productivity is below potential due to limited use of improved inputs, small fragmented plots, marginal soils, limited use of improved varieties, limited availability of seed and limited familiarity with the variety of existing pulse types, and limited usage of modern agronomic practices such as inadequate farm management practices.

Land fragmentation and lack of good practices lead to high production prices. The primary producers are smallholders with small and dispersed plots under rain fed conditions.

Weak linkage among value chain actors: Weak market linkage among producers, processors, exporters and consumers. The link between the producers and the export markets is weak, due to the large number of ineffective intermediaries operating in the value chain. The intermediaries have failed to acquire scale and operate in limited geographic areas. The fragmentation of intermediaries between the producer and consumer markets creates a lack of transparency in markets.

Supply /Marketing Constraints

Poor infrastructure: poor market linkage and road; feeder roads are impassable and do not link farms to markets

Poor marketing infrastructure such as poor storage facilities

- Low consumption
- Poor linkage with other value chain actors: Complex marketing chain results in lower quality and weaker demand signals
- Inefficient marketing system: Limited effectiveness of marketing due to involvement of many actors, leading to excessive handling and weak demand signals, and inadequate financing and transport
- Import of palm oil may be one challenge for domestic oil production such as Soybean oil
- Low access to credit for Soybean marketing
- Inefficient marketing system: Limited effectiveness of marketing due to involvement of many actors, leading to excessive handling and weak demand signals, and inadequate financing and transport
- Import of palm oil may be one challenge for domestic oil production such as Soybean oil
- Low access to credit for Soybean marketing

Challenge to enter in to the export market

While there has been substantial growth in recent years, the current export market in Soybean is underdeveloped. The less developed, fragmented exporters operating at smaller scale in the market results in inconsistent export flows and thus, inconsistent demand for exports. The Major causes of limited export development are:

- Inadequate market intelligence
- Inability to leverage scale efficiencies due to smaller size
- Non-conducive of business environment due to missing credit and insurance;
- Inconsistent export supply: Limited relationship between exporters and importing countries, unstable and erratic demand from importing countries leading to limited number of contracts between exporters and producers
- Inconsistent implementation of policy interventions.

6.8.4 Challenges of processing Business

- Limited raw material supply: poor quality and low supply considered the major constraints in processing Soybean. This might be due to low productivity and unable to meet
- The demand of rising number of processors.
- Low extraction rate
- Weak linkage among value chain actors: Due to the weak vertical linkage, there is an information gap between lead-firms and producers on Soybean quality supply with enough amounts.
- Poor value addition activities: limited processing activities
- Limited number of processors though rising recently
- Limited use and availability of modern processing technology
- Limited finance access across the value chain actors
- Shortage of foreign currency for imported inputs
- Electric power shortage
- Marketing inefficiency
- Limitation related to quality standards
- There is no system developed on standards
- No traceability System practiced
- Lack of knowledge on standards by farmers and other value chain actors
- Most farmers use traditional value adding for Soybean consumption purpose

- Lack of packing materials
- Low seed Quality Problem

6.8.5 Recommended Interventions

The holistic approach to addressing the entire value chain problem requires the interaction of a broader group of stakeholders. This coordination and integration approach helps to ensure that all stakeholders support the intervention plan and all those involved in the Soybean value chain take some responsibility for achieving success. Additionally, this provides a chance to coordinate efforts by numerous actors and aiming for similar objectives – establishment of multi stakeholders’ platform for the sub-sector enhance interaction key actors and able to influence policies. Three major interventions suggested emphasizing development of the Soybean value chain by focusing on creating both a demand-pull and a supply push:

- Increasing productivity through improved input usage
- Linking the export market to producers to stimulate quality and supply
- Strengthening the Export Sector

Taken as a whole, these interventions represent a cohesive set of actions that pursued to strengthen the Ethiopian Soybean value chain. Improving production is key to stabilizing and growing the Soybean value chain, while commercialization provides a demand pull, with the

Middle of the value chain an enabling mechanism to improve production. Proposed specific interventions in the identified areas well described below.

Proposals to strengthening business linkages along the value chain

Input packages: leverage existing input supply system (e.g., Agricultural Input Supply Corporation or new entities as necessary, regional seed agencies, research centers etc.) to assemble inputs for production in packages for distribution to smallholder farmers (Appropriate quantities of seed, fertilizer, and other technologies). Packages should be easily usable by farmers in various regions addressing the challenge of developing consistent, sufficient input access for producers. This effort should build upon existing research in each region, and link with international research bodies to understand up-to-date technologies in other countries to leverage this knowledge.

- Source phosphate and other fertilizers and train smallholders on their use
- Increase breeding of Soybean varieties
- Increase seed multiplication in order to meet needs of export and domestic demand
- Incorporate Soybean into the extension curriculum

Leverage cooperatives and traders as links to farmers to provide inputs and consistent off take and market information. Co-operatives should play the simple role of providing appropriate Soybean inputs, and act as intermediary for exporters, end-users, potentially signing contracts for delivery of exports. The Ethiopian Commodity Exchange (ECX) could also work with/ link with these cooperatives to move Soybean through the system and to increase transparency/ price discovery.

Market information – much done to improve market information systems in Ethiopia, particularly through efforts of regional governments and the ECX. Existing best practice mechanisms (e.g., ECX, regional marketing information systems) should be identified and used as channels to disseminate not only price data, but also other market intelligence data needed to improve linkages in the value chain. Key steps include:

collecting and triangulating market information data, available from different sources; developing a simple, standard display of regional price, supply, and demand forecasts so farmers and aggregators can make informed buy and sell decisions, identifying current best practice information delivery channels, and disseminating market information data, while simultaneously using the government network periodically, for example, posting data in kebele offices.

Contract farming - link smallholders with agribusiness enterprises through the development of best practice models of contract farming. Put mechanisms in place for quality control, largely through the private sector.

Improve market access through the development of road networks and storage facilities

Proposals to strengthening backward linkages with suppliers

Increase Inputs to Improve Productivity

Adequately supply fertilizers – these sourced steadily and supplied to farmers with knowledge on how to use them effectively in different regions and for different agrology.

Expand Soybean breeding - the agricultural research centers and institutes should expand their Soybean breeding programs starting with benchmarking current Soybean varieties in Ethiopia vis-à-vis other countries. This will allow them to leverage existing global technology and ensure the Soybean germplasm in Ethiopia is the best available. Following benchmarking, agricultural research centers and institutes should adapt and adopt these top varieties for the agro-ecological conditions in Ethiopia focused on the varieties appropriate for export, and suitable for the focus regions.

Increase seed multiplication significantly to adequately supply the needs of exporters and other domestic demand. Seed enterprises (such as ESE, RSEs, and private seed growers) can begin growing Soybean seeds with a guarantee to buy from input suppliers. Priority should be placed on producing viable Soybean varieties currently “on the shelf” in research centers (e.g., EIAR) but not in the hands of farmers.

Incorporate Soybean into extension - the extension system should incorporate Soybean into their curriculum, including module development for farmers that explain best practice

Soybean production makes the case for fertilizer, and improved seed usage. Strong links are needed between EIAR and extension in terms of varieties, soil fertility and crop management practices.

Raw material access and sustainability: Developing own Soybean farming land will be an expansion of investment and thereby it will enable the processor’s sustainability of raw material source. Moreover, it will serve as backward linkage between agriculture and the processing sector. It will also help the processors to reduce cost of raw materials. Furthermore, to secure raw materials in desired amount and time, it will be better to follow the principle of contract farming system in raw material purchase.

Improve on-farm storage management practices and structures - reduce post-harvest losses from poor storage facilities and management.

- Encourage commercialization of Soybean products: - promoting smallholder and commercial Soybean production.
- Proposals to strengthening forward linkages with buyers
- Improve the Marketing System
- Market Development and Expansion
- Develop physical and marketing infrastructure: Devote on promotions works; quality labeling and packaging materials across the value chain must be sufficient.
- Marketing study and product diversification: Invest more on market and product development resource (in collaboration with different research institutions)
- Looking for and networking with better price market destination countries
- Strengthening of raw Soybean supply through improving Soybean collection centers, marketing cooperative, provision of feed, logistics and breed improvement. In the processing chain quality improvement, business linkages, training, and technology transfer are important activities considered.
- Proposals to strengthening horizontal linkages with logistics & other services providers

Improve the linkage and coordination in the value chains: links among input suppliers, service providers, producers, and actors in the marketing channel. This may improve adequacy of supply of Soybean for domestic, export and processors (in required quality, quantity and time). Improve market access through the development of road networks and storage facilities with respect to regulatory framework, respondents also evaluate the regulatory policies whether it is favoring or hindering the Soybean business sector. Accordingly, 10%, 60% and 30% of the respondents said that the existing regulatory policy is favorable, favorable but requires improvement, and hindering respectively.

For improving policy frameworks, they recommended that increase land for commercial Soybean production, policy improvement especially export; provide different support for soya processor in the country. In terms of administrative, they suggested that expanding large scale farming in soya, uniform the regulation through regional, smoothing the bureaucracy. For provision of further incentives to encourage investments in the sector, they suggested that encouraging large reliable agro-investment, improve incentives (introduce more incentive packages) to those engaged in processing activities.

Proposals related to ISO and other quality & standard certification to enter developed and emerging markets

International accreditation: In order to address branding and accreditation issue, the government, concerned development partners and private sectors have to work aggressively to establish and functionalize standard laboratories at national level and at potential regions.

- Awareness creation on importance and impact of producing quality and safety Soybean

- Proposals related to export product development & skilled human resource aspects

Strengthening the Export Sector

- Develop incentives for exporters to invest resources to link with input supply bodies
- Build export trader association to build markets, regulate quality and help achieve scale
- Develop a business environment conducive to investment, and policies to scale exporters
- Strengthen export promotion, local and international market intelligence, and the branding of Ethiopian products potentially through exporter association.
- Supply smallholders with input supply
- Improve access to markets
- Link smallholders with agribusiness enterprises through contract farming; put mechanisms in place for quality control
- Improve on-farm storage management practices and structures

Incentivize exporters to link with input supply bodies to provide stronger vertical integration in the sector.

Strengthen and build a dynamic export traders association to build markets, regulate quality and help achieve scale.

Improve business environment to support exporters, making focusing on an environment more conducive to investment (e.g., contract enforcement) and policies aimed at bolstering exporters' scale (e.g., financing for expansion, export promotion/ focus on Soybean, development of risk management tools including potential insurance products). Develop a business environment conducive to investment, and policies aimed at bolstering exporters' scale

Securing skillful human Resources

For capacity building, work with the surrounding technical and academic institutions. Furthermore, the value chain should create conducive working condition, attract workers through various incentive packages.

6.9 Conclusions and Recommendations

The findings in this value chain study demonstrate the importance of Soybeans a significant contributor to the economic and social development of Ethiopia. Soybeans have the potential to be a significant driver for smallholder livelihood improvement and food security in Ethiopia. The consistent growth in the demand for exports and the relative proximity of Ethiopia to these growing markets is an opportunity to boost earnings.

Diversification by small-scale producers, rotating staple cereal production with cropping Soybean, as an important income opportunity. Increasing Soybean production can enhance the protein consumption

of the rural poor, thus ensures food security. Finally, from a macroeconomic perspective, Soybean can boost exports to improve foreign exchange earnings and allow for continued import substitutions.

It is thus important to realize the full potential of the crop as a component of Ethiopia's long-term food security and growth relies on clear direction and execution capacity from GOE and a wide number of stakeholders. To achieve the latent potential in the sub-sector, several constraints must address. A common vision among all stakeholders and the roadmap to undertake the respective roles of different actors across the value chain is critical. The Soybean sub-sector

could strengthened by enhanced on-farm productivity and developing a more efficient chain of inputs and off-take, driven by a strong, stable export sector with strong export players to ensure consistent international demand. The following points are , therefore, recommended for improving the performance of the Soybean value chain .

- Enhancing the use of improved technologies, such as improved seed, fertilizers, pesticides etc...
- Increase adoption of modern agronomic practices (e.g., weeding, depth of planting full crop rotation to ensure healthy soils, etc...)
- Expand and develop market through the application of different Soybean marketing strategies
- Encourage commercialization of Soybean production.
- - Strengthen the linkage and vertical integration among the actors along the value chain
- Enhance promotion for local and international market,
- Reduce bureaucracy and ensure transparency and value chain governance in delivering services by government offices
- Enhance strong linkage between a broad range of well-developed exporters to the international commodity markets and.
- Awareness creation on importance and impact of producing quality and safety Soybean.

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