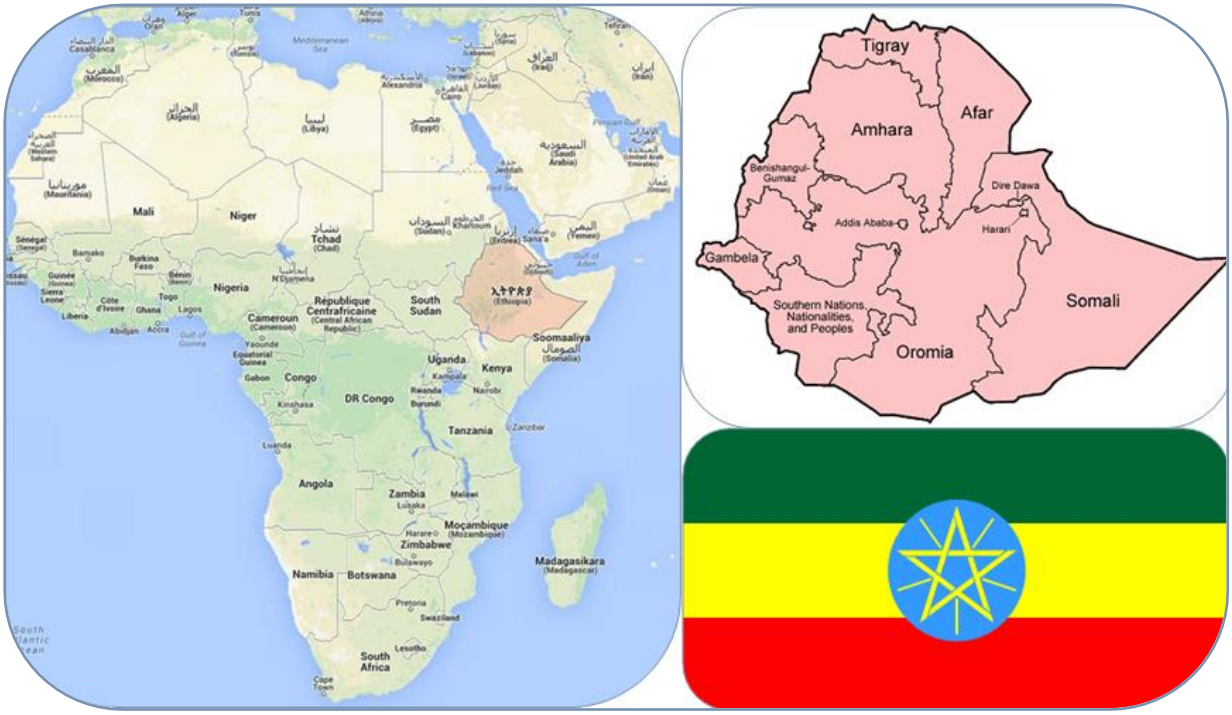
Factsheet
Spices, Herbs and Aromatics in Ethiopia



Contact information

Netherlands-African Business Council
Hilde Duns
Program Manager
T: +31 (0)70 304 3618
C: +31 (0)65 287 4197
E: hilde.duns@nabc.nl

Daphne Willems
Project Coordinator
T: +31 (0)70 304 3618
C: +31 (0)62 225 0768
E: daphne.willems@nabc.nl

Prinses Beatrixlaan 614
2595 BM The Hague
P.O. Box 93082
2509 AB The Hague
The Netherlands

Contents

General information Ethiopia

Ethiopia is the second most populous country in Sub-Saharan Africa. The table below shows a high population growth rate. The actual population (2013) is higher than projected. Rapidly increasing population size with a growing urban population is resulting in a growing demand for dairy products. Dairy development can lead to income generating activities in the rural areas increasing farm incomes and employment opportunities (SNV, 2008).

Ethiopian population	
Population (2012)	91.73 million
GDP	$ 43,133,073,099
GDP growth	8.4 %
Inflation	22,7 %
Per capita income	$ 410
Economic growth (2004-05/2011-2013)	10,6 %
Ethiopians living in extreme poverty* (2011/2013)	29,6%
Ethiopians living from subsistence agriculture	87 %

*Source: World Bank, 2013. *meaning an income below $1.25 a day*

Population and estimated prognoses Ethiopia 2010 – 2020

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pop.	82950	84734	86539	88356	90179	92000	93815	95627	97436	99242	101046

Source: FAOSTAT 2011

Land use and Export	
Area	Total: 1,104,300 sq km Land: 1,000,000 sq km Water: 104,300 sq km
Land use	Arable land: 10,01 % Permanent crops: 0,65 % Other: 89,34 %
Irrigated land	2,900 sq km
Export commodities	Coffee, qat, gold, leather products, live animals, oilseeds
Import commodities	Food and live animals, petroleum an products, machinery, motor vehicles, cereals, textiles

Source: World Bank 2013

Spices in Ethiopia

The history of spices in Ethiopia is an ancient one and spices remain as basic food items of the Ethiopian people. Ethiopia is the homeland for many spices, for example Korarima, long pepper, black cumin, Bishops weed and coriander. The average land covering by spices is approximately 222,700 ha and the production 244,000 ton/annum. At the moment, there are two spice extraction plants in Ethiopia, one public and the other under private ownership. The public spice extraction plant, the Ethiopian Spice Extraction Factory, has a processing capacity of 180 tons per year. The plant is capable of processing ginger from locally grown ginger root, capsium oleoresin from red pepper, and turmeric. Over 85% of its business is for paprika. The privately owned spice extraction plant in Ethiopia is Kassk Spices and Herbs Extraction PLc. This factory was built in Addis Ababa in 1997 and has a processing capacity of 120 tons per annum. All of the extracted spice is exported overseas for food coloring, flavoring, etc. to Europe mainly Germany, Spain and Italy.

Definition of spices

Spices are essential oils that give foods and beverages flavor, aroma and sometimes color. The term spice refers to any dried plant product used primarily for seasoning, be it the seed, leaves, bark or flowers. They can be marketed whole, ground to a powder or in the form of essential oils and oleoresins. Many spices are also used for other purposes. Plants such as turmeric (Curcuma longa) are increasingly in demand for natural therapies, while others such as peppers (Capsicum spp.) serve as substitutes for chemical dyes or pesticides.

Another definition indicates: A spice is a dried seed, fruit, root, bark or vegetative substance used in nutritionally insignificant quantities as a food additive for the purpose of flavoring, and sometimes as a preservative by killing or preventing the growth of harmful bacteria. Many of these substances are also used for other purposes, such as medicine, religious rituals, cosmetics, perfumery or eating as vegetables. For example, turmeric is also used as a preservative; licorice as a medicine; garlic as a vegetable and nutmeg as a recreational drug (Spice Sector Strategy Coordinating Committee, 2010).

Production Process

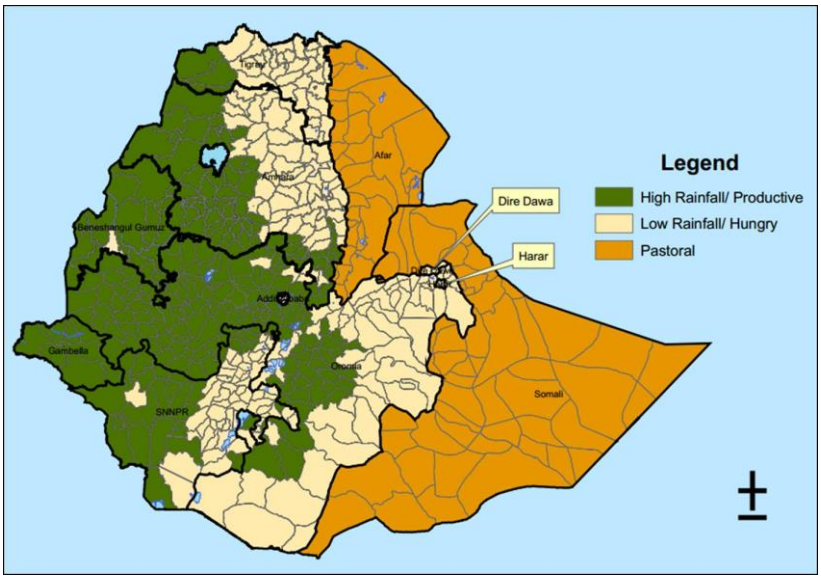
The spices supply process in Ethiopia involves a number of activities that include: input supply, seed/ variety selection, seed bed and transfer plot preparations, seed multiplication, land preparation, sowing/planting production, farm crop protection, weed and pest protection, harvesting, thrashing, semi/full drying and use of appropriate methods of drying, cleaning from foreign matters/ admixture, proper packing and use of appropriate type of packing material, collection/bulking of the harvested spices, supplying, wholesaling, grinding/processing at milling facilities and also factories (including oleoresin preparations), retailing, and domestic consumption, and exporting to overseas markets (UNCTAD, Yimer).

Elements	Items	2008	2009	2010	2011	2012
Area Harvested (Ha)	Pulses	64,709.00	54,243.00	46,216.00	42,354.00	44,000.00
Area Harvested (Ha)	Spices	38,310.00	21,183.00	14,670.00	39,965.00	32,910.00
Production (tonnes)	Pulses	45,906.00	68,798.00	65,912.00	68,727.00	69,000.00
Production (tonnes)	Spices	29,352.00	27,122.00	17,905.00	46,294.00	29,334.00
Seed (tonnes)	Pulses	3,254.58	2,772.96	2,541.24	2,640.00	2,640.00
Yield (Hg/Ha)	Pulses	7,094.22	12,683.30	14,261.73	16,226.80	15,681.82
Yield (Hg/Ha)	Spices	7,661.71	12,803.66	12,205.18	11,583.64	8,913.40

The value chain of spices

Farmers and Collectors in origin: grow, harvest, collect, dry, clean and select. Pack the spice usually in gunny bags. Many now have installed sterilization equipment (mostly steam) and sell HT-spices even in big bags.
Input providers: seeds, fertilizer, packaging, transport.
Agent/Brokers: act as an intermediate between collectors and European clients.
Traders: operate as principal, taking possession of the product.
Grinders: In the Netherlands there are Intertaste, Euroma and Handelsveem still actively grinding.

Ethiopia can be divided into three regions based on agricultural and ecological conditions:



Source: USAID, 2014

Green area: High rainfall, fertile soil, predictable climate, larger landholdings, crop, vegetable, and dairy production

Yellow area: Low rainfall, irregular climate, small landholdings, degraded soil, labor, sheep and goat production

Brown area: Large grazing areas, irregular climate, cattle and camel production

Spices grown in Ethiopia

Due to the varied topography and climate, Ethiopia is home to different plants species that grow on its highlands and rift valley. Out of the 6,000 species of vascular plants that grow in Ethiopia, 12 percent are endemic (Spice Sector Strategy Cooridnating Committee, 2010).

Selection of spices produced in Ethiopia:

1. Korerima: grows naturally at altitude ranging from 1000-2000 meters. Accordingly, its growing places in the country are shown in the following table:

Korerima Growing Places of Ethiopia

Zones	Specific areas
Jima	All Weredas
Wellega	Gimbi, Nekemet, Horo Guduru, Arjo
Sidamo	Sidama, Arero
Bale	Wabe, Genale, Dolo
South and North Omo	Kulo, Gamo, Galeb and Hamer Bako, Gofa
Illubabour	All Weredas
East and West Gojam	Deber Markos, Kola Dega Damot, Metekel, Agew mider

Source: Edossa Etissa, Spices, Research Achievements and experiences, Research Report No.33, Institute of Agricultural Research, Addis Ababa, 1998.

2. Ginger: cultivated in many places of the country than any other spices. The following table shows ginger growing areas of Ethiopia.

Ginger Growing Places of Ethiopia

Zone	Specific areas
East and West Gojam	Bahir Dar, Dejen, Debere Markos, Kola Dega Damot, Metekel and Agew Mider,
Ilubabuor	All
Jima	All
North and South Omo	Gamo, Galeb and Hamer Bako, Gofa and Kulo Konta,
Bale	Wabe, Dolo and Genale,
Sidamo	Sidama and Arero
Wellega	Gimbi, Nekemte, Horo Guduru and Arjo

Source: ibid, p.6

3. Turmeric 'Ird': used as a ground spice and in curry powder, mainly as a food-coloring agent as well as a coloring material in the textile industry. Before 1972, Ethiopia is one of turmeric importing countries. In 1972, two varieties of turmeric were introduced from abroad for adaptability study from India and China and planted at Jima, Metu, Bebeka, Tepi, Wenago, Awasa, Magi and Bako. At all locations turmeric performs well. Turmeric can be grown up to an altitude of 2000m in areas with high rainfall. At present, because of the suitability of Southern humid regions, turmeric is widely grown.

4. Cardamom 'Yeshaikimam': a perennial herb, belonging to the ginger family. It is an expensive spice known as 'Queen of spices'. It is the highest priced spice in the world markets. It is introduced to Ethiopia in 1972. After its introduction to Ethiopia, multiplication of the plant was done at Jima, Bebeka, and Tepi, while adaptability and evaluation studies were done at Jima, Metu, Maji, Wonago, Tepi and Bebeka. Results show that Tepi and Bebeka are ideal for cultivation. Cardamom plant needs a rainfall of 2000 to 5000 mm per annum with a uniform distribution and no distinct dry season.

5. Black pepper 'kundo-berbere': was introduced to Ethiopia from abroad from 1979 to 1980. This cultivar was planted to test its adaptability at Bebeka, Jima, and Tepi adaptations. At Bebeka and Tepi the cultivar grew with excellent performance. Therefore, in Ethiopia it is possible to cultivate black pepper successfully in wider range, from 1250m to extremely lowlands of Southern Ethiopia, where there is high rainfall throughout the year.

The diverse climatic conditions of Ethiopia are suitable for the production of different type of red peppers in different areas of the Country. Red Peppers are widely cultivated in Mareko (SNNPR), Alaba (SNNPR), Ziway (East Shewa), Dembi Dollo (West Wellega), Todalle (Jima Route), Gojam-Gonder Agricultural Development, etc. In 2001/02 the production and yield of red peppers was estimated at 779.6 thousand qt and 13.87 qt/ha respectively (CSA, 2003).

6. Sweet paprika pepper: has been cultivated in the past for supply to the extraction factory. There is no local market for sweet paprika pepper. But the climate and soil conditions are suitable. Today some large agricultural operations have started to grow paprika as an intercrop.

7. Cinnamon 'kerfa': an evergreen tree. It can grow well in almost all soil types under a wide variety of tropical conditions ranging from semi-dry to wet zone. It requires a warm and wet climate with average temperature of 200c to 300c and high rainfall. The cinnamon variety was introduced in Ethiopia in 1975. In Ethiopia it grows at wider agro-ecology than black pepper and cardamom.

As a point of reference, the table shows the production status the southern National and Nationalities Peoples Regional States, which is the major producer of spices in the country.

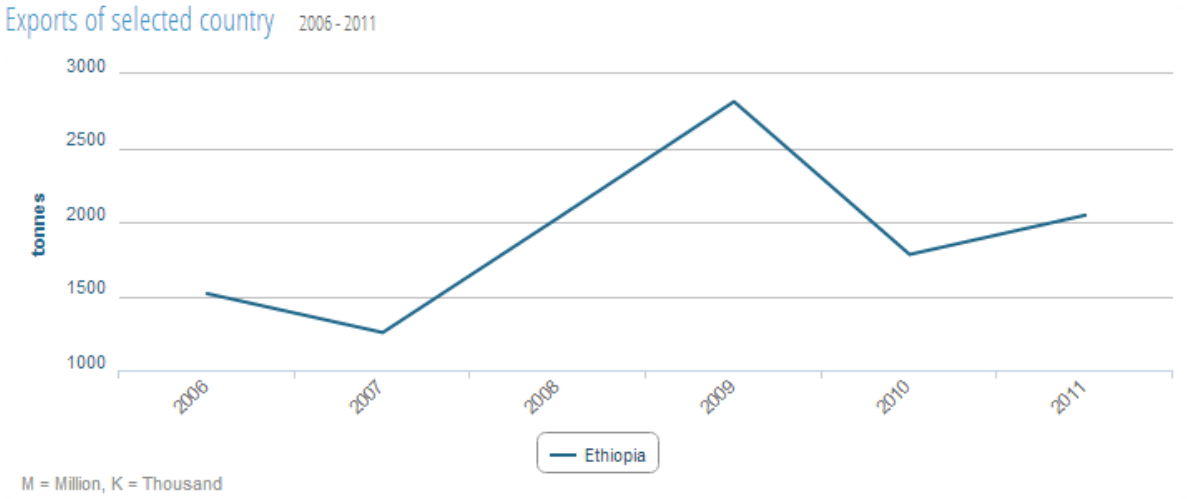
	Production Year			
Type	2009/10	20010/11	2011/2012	2012/13
Ginger	231000	232159	224720	300000
Turmeric	36460	19627	64155	25000
Black Cardamom	55930	67800	29750	10000
Pepper	110000	51200	29100	150000
Others	1410	9430	7242	15000

Spices market in Ethiopia

Spices cultivation is scattered throughout Ethiopia and is carried out by smallholder farmers. In most cases, traders act as middlemen between farmers and spice extraction factories hiring trucks to collect spices from farm gate or intermediate markets.

Spice is an important additive to Ethiopian meals. Therefore, the domestic demand for spices is large. The current estimate of world imports of spices is 5.25 million tones valued at US $ 1,500million, with an annual growth rate of 4 percent. This is against a world production of 8.5 million tones valued at US $ 25 billion. The difference between world production and import is domestic consumption of producing countries. As far as the product mix is concerned, the bulk of spices are exported in "whole" or "un ground" form, while only 15-20 percent of spices are sold in ground form, as mixtures of ground spices and as essential oils and oleoresins.

The substantive shift towards natural products in the West has stimulated the demand for spices in recent times. Added to this is the new demand wave for organic spices in Europe, USA and Japan. Though the size of this market is small (around 1 percent of the total market), the annual growth rate is to the tune of 25-30 percent. Hence, there is a large and growing world demand for unprocessed and ground spices as well as spice extracts such as essential oils and oleoresins (EIA, 2010).



			2007	2008	2009	2010	2011
Export Quantity (tonnes)							
	Ethiopia	Spices, nes	1,254.00	2,029.00	2,813.00	1,781.00	2,046.00
Export Value (1000 US$)							
	Ethiopia	Spices, nes	1,109.00	1,487.00	2,217.00	2,456.00	3,183.00

FAOSTAT, 2011

Opportunities and challenges in the sector

Opportunities
The government of Ethiopia is promoting agro-industrial projects and has declared spices as focus area for development.
As plant species spices have a wide possibility of being cultivated in different agro ecological zones of the country.
Financial services by banks and micro-credit institutions and transportation and related logistic infrastructure are necessary.
The spice subsector is amongst the important crops that fit within the strategy of commercialization of agriculture.
Spice crops already widely traded internationally have a high potential for expansion and diversification of export earnings of Ethiopia.
Support of policy incentives that enable exporters to implement modern processing techniques and machinery starting from Pre Harvesting to Post Harvest processing.
An increasing number of buyers/Traders/Oleoresin Extraction Companies, Pharmaceutical Manufacturers, choose to buy spices directly from Ethiopia.
The Ethiopian Institute of Agriculture Research (EIAR) is conducting research pertinent to the spices subsector in some of its specialized and semi specialized research centers suchas: Tepi (which is major spices research centre), Araca (primarily concerned with ginger), Jimma (primarily concerned in coffee but also some spices) & Bako (in essential oils).

Challenges
The cultivation practice and technique are highly based on knowledge that passed from generation to generation, and the production level is low.
In need of an efficient spice value chain service delivery mechanism.
Innovate technologies (farm management, drying, storage) and spice agricultural research needed.
Post-harvest handling of the product is inadequate: poor and re-used packaging, storage in unclean sheds and next to e.g. chemicals, much up- and offloading, bumpy transport.
Irregular supply and variable quality of spices produced from forest and agricultural landscape
Weak role of private commercial investors in spices production
Weak business linkage among stakeholders in the chain including farmers, traders, processors and meso-level support institutions and macro level regulatory and enforcement institutions.
Increasing role and importance of unlicensed brokers in the trading of spices in the market
Weak marketing system not stimulating production and marketing based on enforceable quality standards
Lack of value addition in terms of major agro processing activities in spices
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
Challenges to channel the spices products to the international market through market promotion and creation of market links.

The two spice extraction plants in Ethiopia are presently not operating at full capacity due to machinery obsolescence and shortage of raw materials. However, since there is vast area of suitable land for the production of spices in the country it is possible to increase spice production, even by designing an out growers scheme and the rehabilitation of existing plants (Tea production 2010, EIA).

Herbs in Ethiopia

Ethiopia has a long history of spice and herb production for the domestic market and has a unique, indigenous product, Korarima cardamom (Aframomum korarima). Modest quantities of several spices have been exported for centuries to countries in the Middle East and exports to Europe have developed over the past twenty years (Wikipedia).

Definition of herbs

In general use, herbs are any plants used for flavoring, food, medicine, or perfume. Culinary use typically distinguishes herbs as referring to the leafy green parts of a plant (either fresh or dried), from a "spice", a product from another part of the plant (usually dried), including seeds, berries, bark, roots and fruits. In Ethiopia several culinary herbs are produced: chervil, chives, coriander, dill, green basil, lovage, mint, oregano, rocolla, thyme, vernonia, etc. Next to that, the medical herbs produced in Ethiopia are decribed below.

Medicinal herbs in Ethiopia

1. Artemisia abyssinica

Artemisia abyssinica or Chikugn (Amharic) is a species of wormwood that is traditionally used for intestinal problems, for infectious diseases, and is anti-leishmanial (acts against Leishmania parasites). The whole herb can be used to address tonsillitis, and an infusion is traditionally drunk as a remedy for colds, and sickness in children.

2. Demakese

Ocimum lamifolium

Used to treat coughs and colds, the fresh leaves are squeezed and the juice sniffed. The juice can also be used as an eye rinse for eye infection. Also used for *mich*, an infection of fever with headache and mouth blisters.

3. Aloe vera

Aloe vera, or Eret in Amharic, is known for its cooling and cathartic properties. It is used in Ethiopia for fever, spleen and liver troubles, as well as 'knee troubles in old age' and 'eye treatment'. The juice of the plant would be used on the breast of nursing mothers to assist with weaning as its bitter taste would discourage the baby from suckling. The juice of the leaf is also known to be given to a mother in childbirth to ease labour. In western medicine, the fresh juice of the Aloe vera plant is used as a topical application to cool burns, and the juice is taken orally for digestive disturbance.

4. Zingibil (Amhar) or Dendabil (Tig.)

The rhizome (root) of ginger is popularly used in Ethiopia for stomachache and respiratory problems. It is chewed or masticated with 'feto' (Lepidium sativum) for stomach disorders. It is also popularly used for its carminative (relieves gas) and anti-nausea activities.

5. Gisewa (Amhar) or Withania somnifera

Known to be used for coughs and asthma, as a narcotic and an anti-epileptic in Ethiopia. Research notes other traditional uses for headache (as a dressing), paludism (malaria), ague, fever, stomachache and as a diuretic. The smoke of the burning root is commonly inhaled for 'Satan beshita' or 'devil disease' (Asres 2001).

6. Kebercho

Endemic to Ethiopia, Echinops kebericho, is used for fever and as a taenicidal herb (to expell tapeworm). The smoke from burning the plant is inhaled to relieve headache and also as a cure for "evil eye" (possession by evil spirits in Ethiopian folk religion).

Production

The number of small scale producers involved in horticulture is estimated at 5.7 million farmers. Few smallholder farmers are engaged in out growers or rangements and some farmers association unions have been established.

Small scale farmers produce 2.1 million tonnes of vegetables from 260 thousand ha while the State Farms produce 18 thousand tonnes from 880ha. The supply of vegetables for the European market comprises predominantly green 'bobby' beans. There are two private exporters cultivating around 225ha of green beans each with outgrowing arrangements with a limited number of farmers in their vicinity. The production of green beans relies on surface or furrow irrigation, which is a cheap but very labour intensive and water inefficient method. Moreover, it requires machinery for proper levelling of the fields. A joint venture near Koka was the first to make the considerable investment in drip irrigation. Van Oers Import and Ethio Flora have been granted PSOM contribution in 2004 to set up the production, processing and packing of green beans for export to the Netherlands. The state farms have reduced their produce range significantly over the past years and big chunks of its land near Ziway have been leased out for floriculture or are for sale. Increasing number of investments and experiments are undertaken by private companies to produce peas, mangetouts, cherry tomatoes and asparagus for export to the EU market. Growers in Southern Ethiopia have also successfully started herb production, partly in green house (Wiersinga and De Jager, LEI WUR, 2009).

Opportunities and challenges in herbs sector

The Government of Ethiopia is giving priority to the horticultural sector and other export products like leather, oilseeds and coffee, and as a result the investment package offered is attractive. It includes amongst others a tax holiday and favourable financing possibilities and active assistance for obtaining land. Land can be leased on long term at very favourable conditions, labour is cheap and loans can be obtained at advantageous terms. Other important ad vantages of Ethiopia are the personal safety and the fact that government of fices work according to procedures. This results in a relatively low level of corruption compared to other African countries. Export of fruit and vegetables has been limited but is now growing strongly with new investors coming in. Both in Europe and the Middle East there is a growing interest for products from Ethiopia. Presently, the main export

products are fresh beans, strawberries, tomatoes, courgettes, peppers and fresh herbs (Wiersinga and De Jager, LEI WUR, 2009).

The Government of Ethiopia increasingly considers the private sector as the engine of economic growth and the catalyst for employment creation and export expansion. As a result private companies were allowed and facilitated with an array of incentives to engage in the sector (Wiersinga and De Jager, LEI WUR, 2009).

Aromatics in Ethiopia

Ethiopia is located in the African Gum Belt and is one of the few countries with large frankincense and myrrh resources. The country has a potential annual production of 70,661 tons from the 2.9 million ha of land total area covered of oleo-gum resin bearing species. In terms of the market for gums and resins other than gum Arabic (aromatic gums), Ethiopia has 1 percent of the world market and 28 percent of the Africa's export trade (Sisay and Samuel, 2011). Trade volumes of gums and resins in Ethiopia have been increasing since the 1990s. Between 1997 and 2011, Ethiopia exported about 45,323 tons of natural gums and resins to the world market.

The variety of incense, perfumes and other aromatic materials are important in international trade since ancient times. The importance of incense in those days is documented by the fact that the first great trade route in history is called the 'incense road' (Goettsch, 1991). The world markets for incense and myrrh are dominated today by South-Yemen, Ethiopia and Somalia.

Definition of aromatics

The amazing variety of incense, perfumes and other aromatic materials gained our interest and attention when we collected spices in the marketplaces of Addis Ababa and its surroundings.

Aside from incense and myrrh very little is generally found in research literature about the use of plants as perfumes and aromatics in Ethiopia. In this paper those plants and plant products will be treated, which were found in markets in central Shewa, the administrative region around Addis Ababa and in the capital itself. Some plant products have also been reported from the Bale administrative region.

The subject will be treated in three sections: the first will deal with incense and myrrh and will consider their importance in international trade since ancient times. The other two sections will cover aromatic plant materials of different uses and perfume plants, respectively.

Incense and myrrh

From time immemorial the fragrant smoke of burning resins and the aromatic odours of ointments and balms have been used by Man in religious rituals.

In the ancient Mediterranean civilizations incense (or frankincense, as it is also called) and myrrh were considered, at times to be more precious than gold (Gauckler, 1970). The importance of incense in those days is documented by the fact that the first great trade route in history is called the 'incense road', covering a distance of about 5000 km from the kingdoms of southern Arabia ('Arabia Felix') to the cultural centres to the east of the Mediterranean Sea.

Aromatics grown in Ethiopia

Selection of aromatics produced in Ethiopia:

1. Lavender:

I s a genus of 39 species of flowering plants in the mint family, Lamiaceae. The genus includes annual or short-lived herbaceous perennial plants, and suffrutescent perennials, subshrubs or small shrubs. Leaf shape is diverse across the genus. They are simple in some commonly cultivated species; in

others they are pinnately toothed, or pinnate, sometimes multiple pinnate and dissected. In most species the leaves are covered in fine hairs or indumentum, which normally contain the essential oils.

2. (Frank)Incense: Frankincense and myrrh are phytotoxically safe raw materials in industries like pharmaceuticals and food industries. They are used in folk medicines, flavoring, beverages and liqueurs, cosmetics, detergents, creams and perfumery, paints, adhesives and dyes manufacturing (Tilahun, 1997; Getachew and Wubalem, 2004). Both myrrh and frankincense are highly valued for their aromatic fragrances and are common ingredients in incense, perfume and potpourris, soaps, detergents, creams and lotions, and are often included in meditation blends, as it strengthens the psyche and aids in deepening the meditative state (FAO, 1995). Three types of frankincense products are recognized in Ethiopia: Tigray, Ogaden and Borena.

Incense is aromatic biotic material which releases fragrant smoke when burned.

3. Myrrh:
Myrrh is the aromatic resin of a number of small, thorny tree species of the genus Commiphora, which is an essential oil termed an oleoresin. Myrrh resin is a natural gum. It has been used throughout history as a perfume, incense and medicine. It can also be ingested by mixing it with wine. In pharmacy, myrrh is used as an antiseptic in mouthwashes, gargles, and toothpastes.

4. Gum Arabic:
Gum Arabic is used as thickening, stabilizing, emulsifying and suspending agent in food and drink industries; as tablet-binding agent and cream- and lotions- suspending and emulsifying agents in pharmaceuticals, as film forming and sizing agent in printing and textile industries (Getachew and Wubalem, 2004). It is also used in ceramics, paints, inks, textiles and adhesives (Chikamai, 1996). In cosmetics, gum arabic functions as a stabilizer in lotions and protective creams, where it increases viscosity, imparts spreading properties, and provides a protective coating and a smooth feel. It is used as an adhesive agent in blusher and as a foam stabilizer in liquid soaps (Whistler, 1993).

5. Opoponax
Opoponax or sweet myrrh is a cousin of the healing Myrrh Commiphora Myrrha with a warm-balsamic and sweet, honey-like aroma. It is a natural oleo-gum-resin like myrrh and frankincense. The color of its resin is brown; however, good quality crude botanical resin is dark red. Opoponax has been a component of incense and perfumes since Biblical times. Talking of perfumery in particular, Opoponax qualities from several Commiphora are widely used, especially in oriental fragrances, to impart sweet balsamic notes.

Aromatics market in Ethiopia

The industrial demand for essential oils and extracts in the country is met through imports. Exact data on the imports of essential oils extracted from natural gums is not available. The import volume of various types of essential oils and extracts has increases almost four fold within the last fifteen years (Ethiopian Revenue and customs Authority). Such huge increase is a result of expansion of the industrial sector that makes use of essential oil.

For instance, in 2011 the country paid out nearly 30 million USD to import 1,596 tons of various types of essential oils and mixtures of odoriferous substances from countries such as Ireland, South Africa, the Netherlands, Spain, United Kingdom, etc.

This suggests the existence of huge demand for essential oils in the country. Introducing value-added processing of the resources would produce greater benefits and offers viable investment opportunities.

Comparison of actual and potential gum and resin production in Ethiopia, Based on figures for 2003/04

Regional state	Estimated actual production (in tons)	Share of total annual production (%)	Estimated potential production (in tons)	Share of actual production to potential (%)
Tigray	4,993	62	30,433	16
Amhara	2,396	30	16,545	14
Benishangul	316	4	2,500	13
Oromia	130	2	4,031	3
Somalia	185	2	4,106	5
Others	–	–	13,042	–
Total	8,020	100	70,661	14

Source: a MOARD for 2003/04 adopted from Mulugeta Lemenih (2011)

Opportunities and challenges in aromatics sector

Despite its huge potential, Ethiopia has not fully benefited from the sector. It exports raw gum and resin materials without further industrial processing. Essential oils that can be extracted from gum have wide applications as odorants, flavorants and pharmaceutical ingredients in the manufacturing sector. The price for these essential oils is 5-10 times higher than the price of the dry extract resins on a weight basis (CBI Market Survey, 2011).

Sources

Asres, K., Bucar, F., Kartnig, T., Witvrouw, M., Pannecouque, C. and De Clercq, E., 2001. Antiviral activity against human immunodeficiency virus type 1 (HIV-1) and type 2 (HIV-2) of ethnobotanically selected ethiopian medicinal plants. Phytotherapy research 15, 62-69.

Botanic Ethiopia, herbs: <http://botanicaethiopia.com/herbs/>

Ethiopian Investment Agency, 2010, *Investment Opportunity Profile for Spice Processing In Ethiopia.*

FAOSTAT, 2011, *Country report on the state of plant genetic resources for food and agriculture,* <http://www.fao.org/docrep/013/i1500e/Ethiopia.pdf>.

Goettsch, E., 1991, *Traditional aromatic and perfume plants in central Ethiopia (a botanical and ethno-historical survey),* pp. 114-122.

Spice Sector Strategy Cooridnating Committee, 2010, *Spice Sub-Sector a strategy for Ethiopia*, <http://www.intracen.org/uploadedFiles/intracenorg/Content/Exporters/Sectoral_Information/Agricultural_Products/Spices/Ethiopia-strategy.pdf>.

Tadesse,W., *Natural gum and resin bearing species of Ethiopia and their potential applications*, 2007.

Tariku, Y., Hymete, A., Hailu, A., Rohloff, J., 2010. Essential-Oil Composition, Antileishmanial, and Toxicity Study of Artemisia abyssinica and Satureja punctata ssp. punctata from Ethiopia. Chemistry and Biodiversity 7.

Yimer, M., 2010, *Market profile on spices*, UNCTAD ITC, <http://www.intracen.org/uploadedFiles/intracenorg/Content/Exporters/Sectoral_Information/Agricultural_Products/Spices/Market%20Profile%20on%20Spices-%20Ethiopia.pdf>.

Wiersinga, R., De Jager, A., Business opportunities in the Ethiopian fruit and vegetable sector, LEI WUR, 2009).