Food, Beverage and
Pharmaceutical Industry
Development Institute of Ethiopia

gain
Global Alliance for
Improved Nutrition

Ethiopia Edible Oil Industry Mapping

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Acknowledgements

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Thank you to all the edible oil processors who provided their time and information to support this effort

About FBPIDI

The Ethiopian Food, Beverage and Pharmaceutical Industry Development Institute (FBPIDI) was established by the council of Ministers under the regulation number 287/2013 with the aim of providing support to the food, beverage, and pharmaceutical institutes through technology transfer and enhancing the competitiveness of the sector at international level. To understand the status of the food processing sector, the institute engages in regular data collection, studies, and research to generate evidence that can help to boost the planning, implementation, and decision-making process in the sector.

About GAIN

The Global Alliance for Improved Nutrition (GAIN) was launched at the United Nations in 2002 to tackle the human suffering caused by malnutrition. GAIN is a global, Swiss based foundation that mobilizes public-private partnerships and provides financial and technical support to deliver safe and nutritious foods to those people most at risk of malnutrition.

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Contents

1. Introduction

The word oil is derived from the Latin word *oleum*, originally used for *olive oil*, but nowadays it means any of numerous combustible and unctuous substances that are liquid at room temperature (this distinguishes them from fats) and soluble in many organic solvents but not in water. Edible oils are derived from plants and chemically composed of triglycerides and several other minor components. They are major components of the human diet, along with carbohydrates and proteins. Lipids in general, and edible vegetable oils in particular, are very important in the cooking and palatability foods. Sources of edible oils are many and varied, and their quality attributes such as nutritional properties, health benefits, lipid composition, odor, and color are important for consumers [1]

Ethiopia has favorable agro-climatic conditions for the cultivation of oil seeds and is one of the centers of origins in the world for several oil crop plants like rape seed, Niger/noug seed, and castor beans. Other oilseeds like linseed, soybeans, groundnuts, sunflower, and safflower seeds are produced in different parts of the country [2]. Production and export of sesame seed has increased dramatically in the last ten years and thus Ethiopia. Ethiopia is fourth largest producer of sesame seed in the world behind India, China and Sudan. Niger seed, which is also known as noug, is the second most widely-produced oilseed crop in Ethiopia, accounting for a little more than a quarter of total oilseed production and accounting for 28 percent of area planted to oilseeds. All other oilseed crops (soybeans, linseed, groundnuts, cottonseed etc.) grown in Ethiopia are almost entirely used domestically.

Edible oil for consumption in Ethiopia is mainly imported from different countries. In calendar year (CY) 15, Ethiopia imported 479,000 metric tons of cooking oil, valued at nearly $474 million dollars. Of this imported oil, more than 90 percent by volume was palm oil, most of which comes from Indonesia and Malaysia. The remainder of imported oil is made up of sunflower, soybean and olive oils. See tables 1 and 1A for breakdown of oil imports volume and value

Table 1 Edible Oil Import Volume (MT)

Imports	2010	2011	2012	2013	2014	2015
Palm Oil	212,686	228,209	292,797	139,899	373,763	442,536
Sunflower Oil	1,135	2,228	1,453	2,198	2,450	9,704
Soy Oil	713	6,755	654	2,001	656	6,746
Vegetable Fats & Oils	11,912	11,263	17,041	13,487	11,316	16,954
Olive Oil	86	166	174	253	308	758
Sesame Oil	5	390	14	5	16	13
Other Edible Oils	780	3,548	85	194	577	1,877
Total	**227,316**	**252,559**	**312,217**	**158,038**	**389,086**	**478,588**

Source: ERCA

Table 1A: Edible Oil Import Value ('000 USD)

Imports	2010	2011	2012	2013	2014	2015
Palm Oil	216,763	322,786	382,278	145,832	403,198	419,636
Sunflower Oil	1,458	3,909	2,438	4,055	4,309	15,692
Soy Oil	1,009	11,956	1,203	3,109	1,083	8,787
Vegetable Fats & Oils	18,099	19,564	28,453	16,935	18,355	25,220
Olive Oil	209	529	510	660	1,066	1,840
Sesame Oil	7	430	30	26	47	71
Other Edible Oils	1,013	5,779	196	312	973	2,582
Total	**238,557**	**364,952**	**415,109**	**170,929**	**429,031**	**473,806**

Source: ERCA

Moving back to local types of edible oils and oilseeds and reducing the import burden for edible oils will require engagement with edible oil processing facilities and importers to better understand the context, local capacity, challenges, and opportunities for growth.

1.1 The Processing of Edible Oils

Edible oils are processed from oil seeds of various types, as shown in the Process Flow Diagram (Figure 1). First, oil seeds must be procured and approved based on their quality characteristics. Oil seeds should be cleaned and sifted to remove extraneous matter and conditioned or pre-treated. Depending on the type of oil seed, this may include soaking, cooking, removing hulls, and/or flaking or crushing.

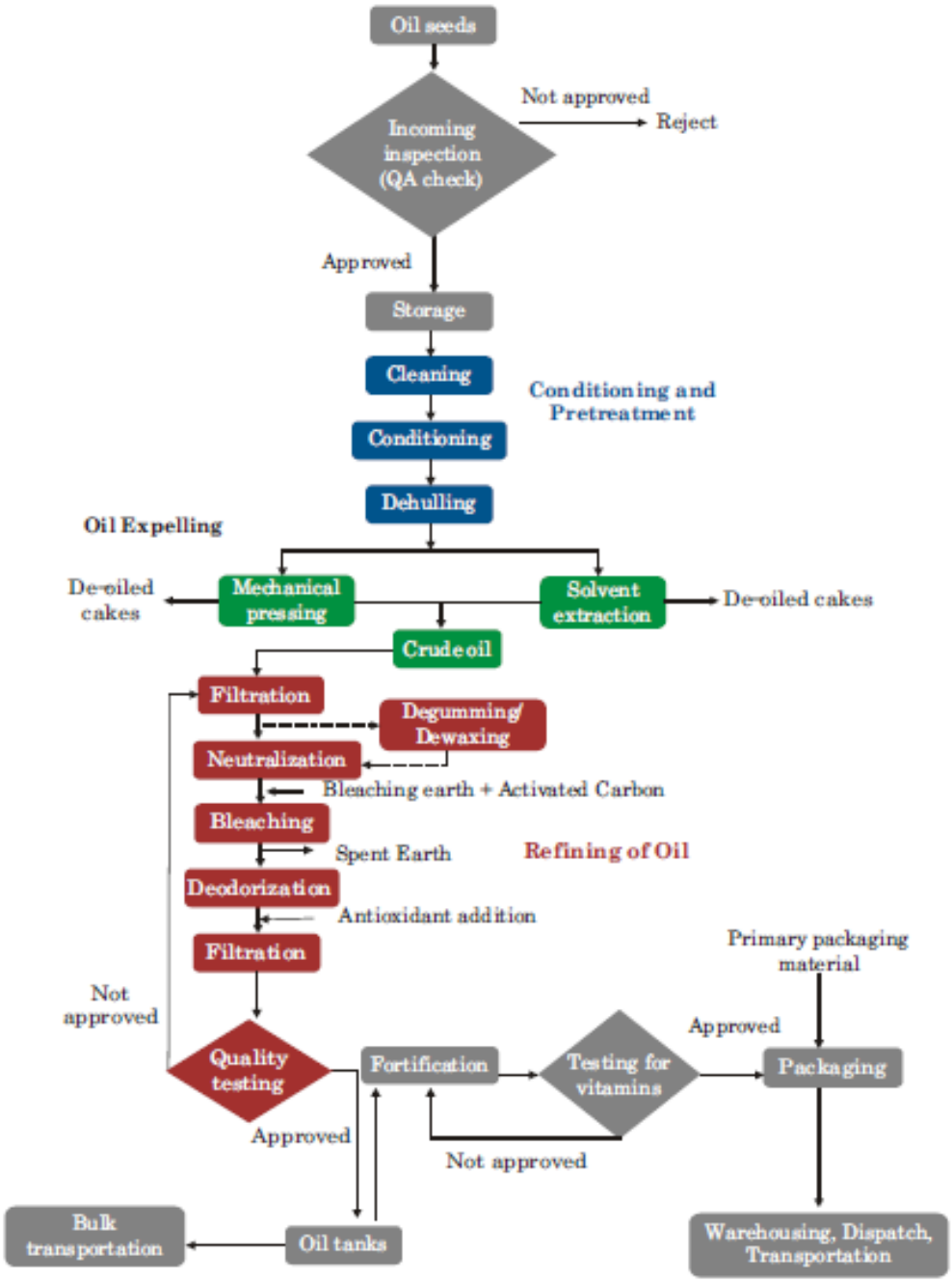
Oil must then be extracted from oil seeds. This can be done via mechanical or chemical means. Mechanically, oil seeds can be pressed or centrifuged to physically extract oil. This method has relatively low yield or oil recovery, but avoids some potential damage to the quality and stability of the oil. Chemically, oil can be extracted using a solvent (e.g. n-hexane),

which is a faster process, achieves higher yields, and avoids degradation due to heat which can occur during mechanical processes. Using a combination of both methods, oil processors can recover about 99% of the oil contained within the seeds.

Next, the crude oil that has been extracted must be refined and filtered. This process removes undesirable compounds, such as foreign matter, gums, free fatty acids, wax, color pigments, and odorous compounds to obtain oil of edible quality. Operations such as distillation, winterizing, bleaching, and deodorizing eliminate residual solvents, peroxides, triglycerides, and other compounds that contribute to rancidity. Hydrogenation can also occur to produce cooking oils.

Packaging is an important component to oil processing and must be chosen to reduce exposure to light, oxygen, temperature, enzymes, and other environmental factors which can limit shelf life. The addition of antioxidant tocopherols (vitamin E) is often used to stabilize some oils and improve shelf life. Many different types of packaging are used for edible oils, including tin cans, glass bottles, PET or HDPE plastic bottles, and paper-based cartons, the latter of which is most common. The selection of packaging is generally done on the basis of marketing and economic criteria. However, the type of packaging materials, packaging geometry, and techniques of filling and closing the containers may significantly affect oil quality during their shelf life [3].

Figure 1: Process Flow Diagram for Edible Oil Processing

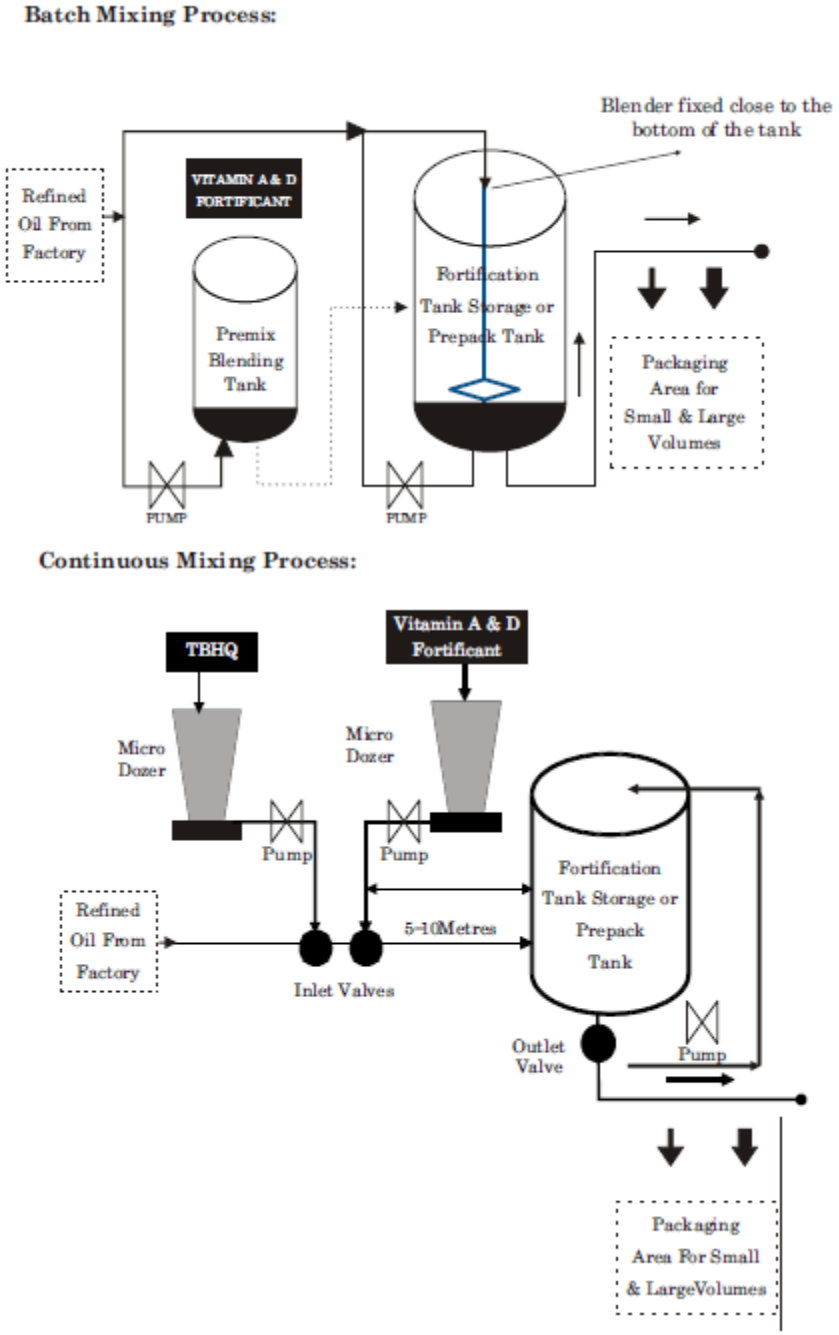


1.2 The Fortification of Edible Oils

Fortification is the process of adding vitamins to edible oil in a controlled manner to deliberately increase the content of these vitamins in the diet and improve the nutritional quality of food. Fortification can provide a public health benefit with minimal risk to health. Globally, edible oils are often fortified with vitamin A and vitamin D. Ethiopian Edible Vegetable fats and Oils standard (ES 6133:2018 specifies also fortification with Vitamin A and Vitamin D.

Vitamin A deficiency can negatively affect vision, immunity, bone growth, and cellular processes and has both health and economic impacts on populations. Improvement of vitamin A status in children can lead to a reduction of 23% of all-cause child mortality (deaths); prevent around 1.3-2.5 million deaths among children under 5 years old, and reduce mortality during pregnancy [4, 5]. Vitamin D is critical for bone strength and mineralization and decreases the risk of many chronic illnesses, including cancers, autoimmune diseases, infectious diseases, diabetes, and cardiovascular disease.

Figure 2: Batch and Continuous Mixing Processes for Fortification



Both vitamins A and D are fat-soluble and thus require consumption alongside a source of fat, such as edible oil, to be absorbed and processed by the body. Fortification of edible oils is thus a well-established and cost-effective method for reducing and preventing deficiencies of these vitamins in populations who consume edible oils and especially among those who do not consume much meat or dairy products.

Fortification can occur in a continuous or batch mixing process (Figure 2). A pre-blend of nutrients is prepared, then mixed with refined oil prior to packaging. Routine internal and external monitoring of the food safety and fortification of edible oils is critical to ensure consumers benefit from the vitamins as intended while reducing risk of excessive intakes.

1.3 Study Objectives and Scope

The objective of the mapping and assessment exercise was to gather available information on the edible oil processing sector in Ethiopia to:

- Understand the locations, capacity, processing type and methods, technology, and quality of edible oil products produced domestically;
- Document the current performance of edible oil processing factories and identify major challenges faced by the industry and opportunities for growth; and
- Assess the potential of the edible oil processing facilities to engage in edible oil fortification under the new fortification standard.

This mapping study focused in the administrative regions of Ethiopia where oil production takes place to provide prioritization of efforts for further planning, technical assistance, monitoring, and research throughout the forthcoming edible oil fortification program. This mapping serves as a baseline to that effect.

1.4 Study Methodology

Primary data was gathering during field work from April-May 2017. This included in-depth interviews and site assessments of 245 edible oil factories. The processors were asked about their production capacity, types of products and processing methods and technology, number of employees, fortification knowledge, quality assurance/quality control protocols, and challenges they face. Data regarding raw materials used for production of edible oils were also collected. GPS information was also collected to develop maps of the distribution of edible oil processors.

Secondary data were drawn from various public sources of data, including literature searches and unpublished reports from GAIN, FBPIDI, and other partners.

A stakeholder workshop was held on 28 June 2017 to validate the findings and discuss implications among edible oil processors, government agencies, and research institutes.

2. Study Results

The study team assessed 244 edible oil processing factories. Of these, 17 were not included in the study because they were either in a project/pilot phase of operations, reported having no employees, or reported having no production volume. Thus, the denominator for all following results is 227 edible oil processing factories, except where otherwise noted.

2.1 Geographic Location and Establishment

The distribution of the 227 edible oil processing factories assessed is shown in Table 1. The mapping was conducted Amhara, Oromia, Benishangul -Gumz, Harari and SNNP regions and Addis Ababa administrative city. Most of the oil processing factories (64%) are found in Oromia Region, 18% in Amhara Region, and 16% in Addis Ababa City

Table 1: Distribution of Edible Oil Processing Factories

Region	# of Factories	% of Total Factories
Harari	1	<1%
Benishangul	1	<1%
SNNP	2	<1%
Amhara	33	15%
Addis Ababa City	38	17%
Oromia	152	67%
Total	**227**	**100%**

Most of the edible oil processing factories (78%) are considered Public Limited Companies (PLCs). Cooperatives make up 3% of the factories; 6 out of the 7 cooperatives are in Oromia. The rest of the factories did not specify a type of company.

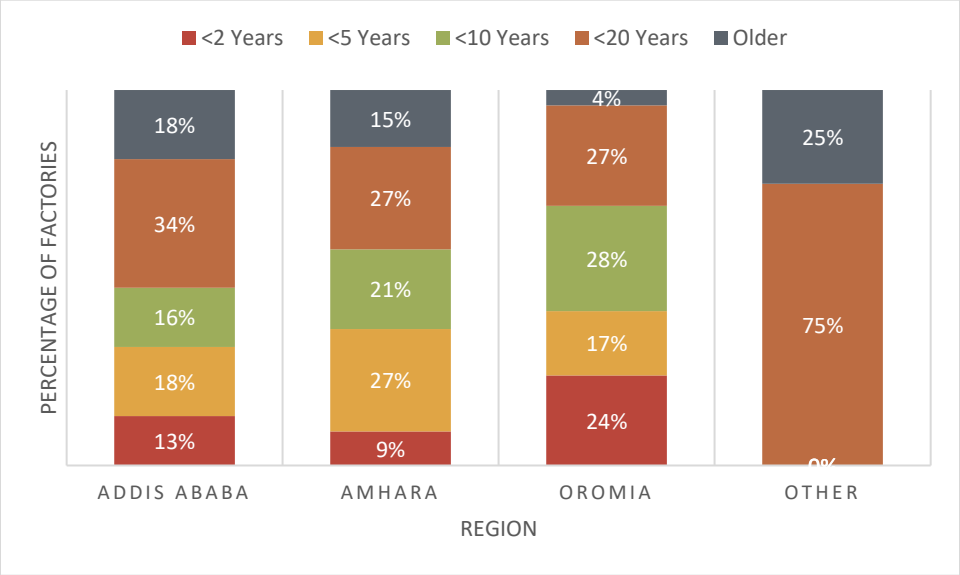
The edible oil factories assessed were established between 1978 and 2017[1]. These are categorized by age in Table 2 below and by region in Figure 3. Note that the "Other" Region encompasses Benishangul, Harari, and SNNP

Table 2: Age of Edible Oil Factories

Establishment Date	# of Factories	% of Total Factories
Past 2 Years (2015-2017)	43	19%
Past 5 Years (2012 – 2015)	41	19%
Past 10 Years (2007 – 2012)	54	24%
Past 20 Years (1997 – 2007)	64	29%
Older (Before 1997)	19	9%
Total	**221**	**100%**

[1] Six factories did not provide a date of establishment.

Figure 3: Percentage of Factories in Each Region Established within Each Date Range

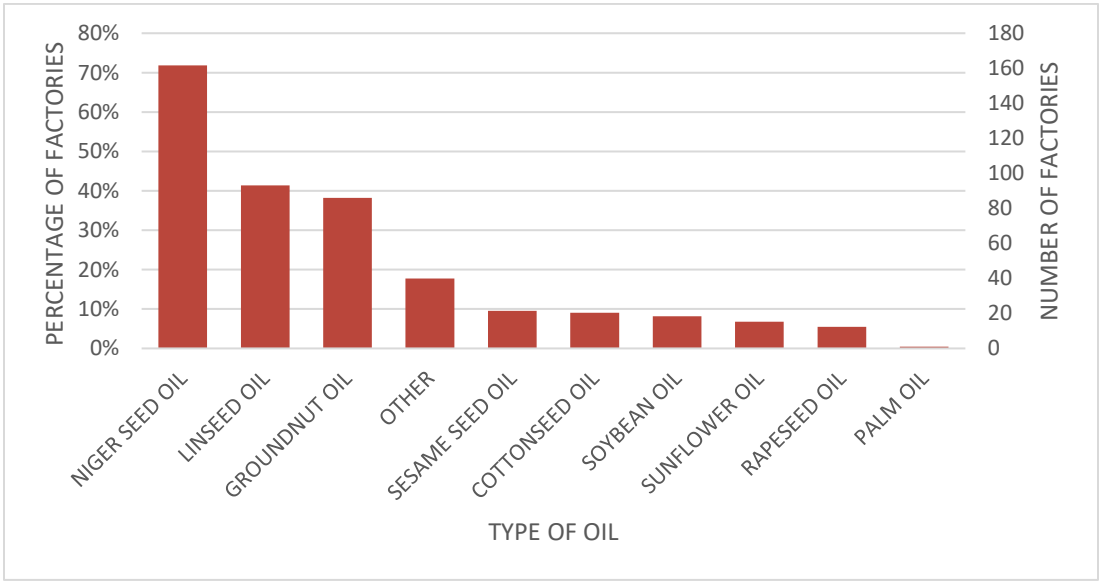


2.2 Production and Processing Capacity

2.2.1 Oil Type

Nine types of edible oils were reported to be processed by the assessed factories[2]. These are shown in Figure 4 below along with the number and percentage of factories producing that oil type. On average, each factory produced two different types of edible oils with a range of 1-5 different oil types.

Figure 4: Types of Edible Oil Produced in Ethiopia



[2] Seven factories did not provide information on the type of oil they produce.

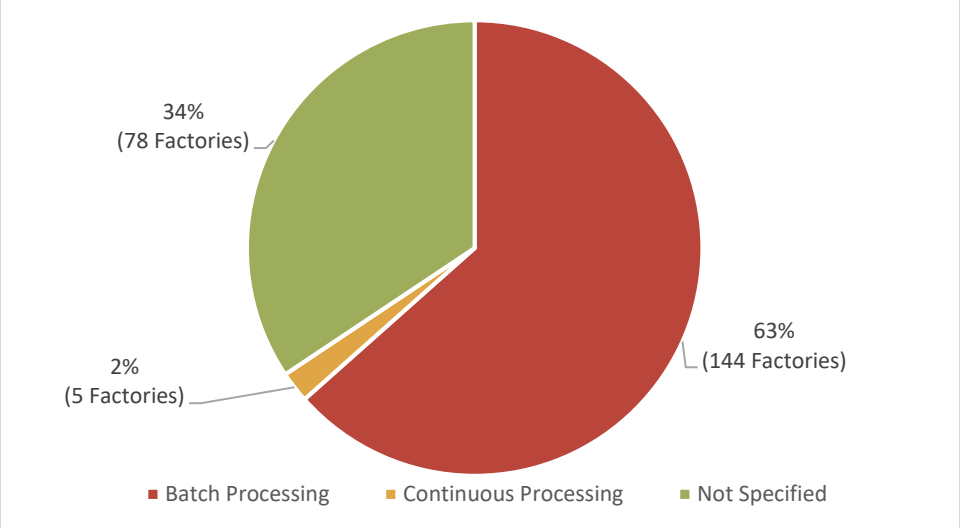
2.2.2 Processing Technology

Depending on the type of edible oil being processed, different types of processing technologies and methods should be used. For example, rapeseed, maize, cottonseed, sesame seed, and linseed oils must pass through a full refining process (including degumming, neutralizing, washing, drying, bleaching, and deodorization). On the other hand, Niger seed, groundnut, and sunflower seed oils need only to pass through a semi-refinery system (neutralizing, washing, and drying only). Of the 122 factories reporting that they produce oils that should pass through a full refining process, only 3 of them report having such refining processes.

Edible oil can be refined through mechanical pressing or solvent extraction, or a combination of both. In the 227 assessed Ethiopian oil producers, 220 of them (97%) use a mechanical pressing method, one producer uses solvent extraction, and 5 of them use both methods[3].

Edible oil can also be produced either as a batch or continuously. Batch processing involves processing a specific quantity of edible oil through each step of the process, then cleaning the container and starting again with a new batch. Continuous processing involves oilseeds continuously being fed into a machine for processing. The distribution between batch and continuous processing types found in assessed edible oil factories is shown in Figure 5.

Figure 5: Distribution of Processing Methods Used by Edible Oil Processing Factories



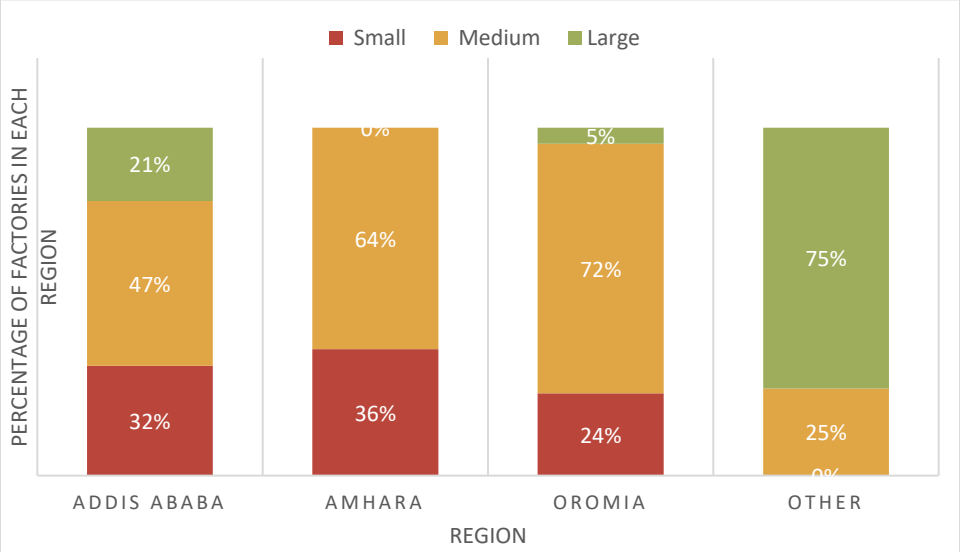
2.2.3 Processing Capacity

The size and capacity of the factory is reflective of the total volumes (and potential volumes) of edible oil which can be produced. Edible oil producers can be categorized into small (up to 500 Liters/day), medium (500-5,000 Liters/day), and large (5,000 Liters/day or more)[4], based on their reported design capacity. Two-thirds of producers (149 of 225 responding

[3] One edible oil factory did not specify which oil extraction method used.
[4] Those producing 500 Liters/day are classified as medium and 5,000 Liters/day are classified as large.

factories) fall under the medium category, with 27% (60 factories) categorized as small and 8% (18 factories) categorized as large[5]. The median factory size was designed for 800 Liters/day with most factories reporting a design of 1,000 Liters/day. The size distribution by region is shown in Figure 6.

Figure 6: Size Distribution of Edible Oil Factories by Region



Edible oil factory capacity utilization is constrained with 87% of assessed factories reporting operating at 50% capacity or less and over 30% of factories reporting operating at 25% capacity or less. The average and median capacity of all assessed factories is 38%. The number of factories across the range of capacity utilization is shown in Figure 7 with these results disaggregated by factory size in Figure 8. These gaps in capacity utilization were attributed to short supplies of raw materials (oilseeds) and electrical power fluctuations. See Section 2.4 for more details on challenges edible oil producers face.

[5] Two edible oil producers did not specify their actual or design capacity.

Figure 7: Percent Capacity Utilization by Edible Oil Processing Factories

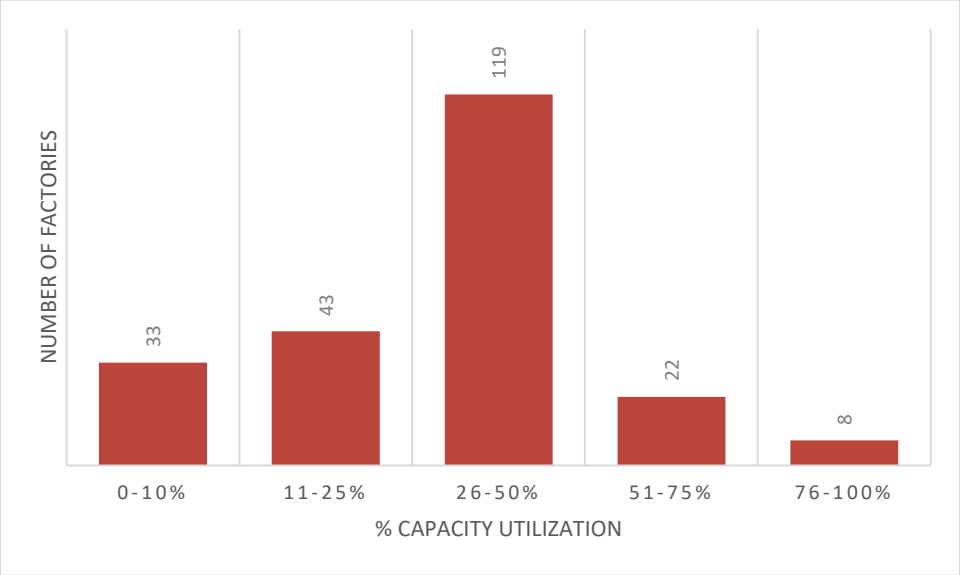
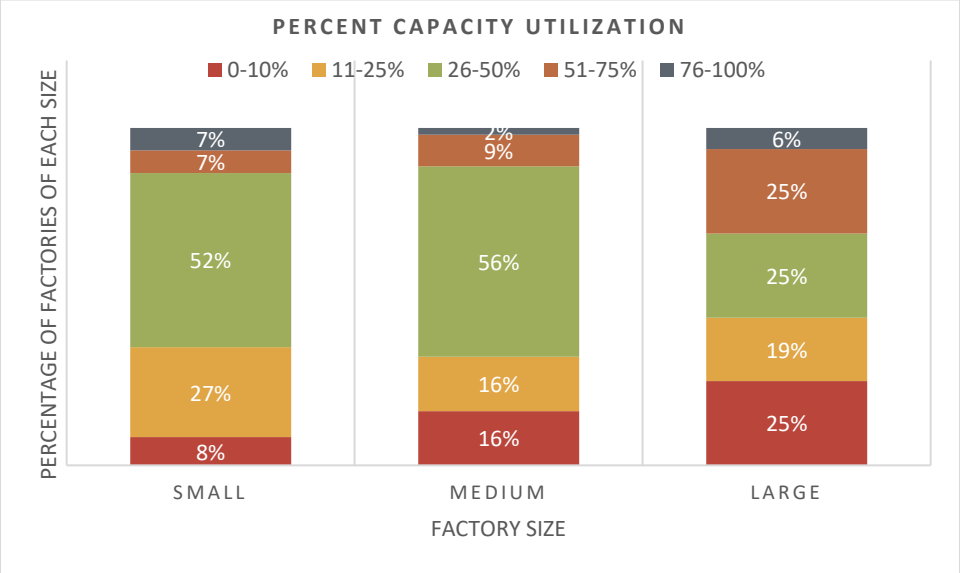


Figure 8: Percent Capacity Utilization of Each Size of Edible Oil Processing Factories



2.2.4 Quality and Safety

Fortified food must meet the quality and safety requirements set forth in established standards; it is therefore critical that edible oil producers have the technical knowledge and equipment to ensure the quality and safety of their products. Production of fortified products require additional Quality Assurance /Quality Control (QA/QC) measures over what processors are accustomed to with non-fortified products.

Assessed edible oil factories were asked whether they have Good Manufacturing Practices (GMP) in place. Seven out of the 18 assessed large scale factories (39%) and 4 out of 149 medium scale factories (1%) reported following the principles and protocols of GMP.

To test for the quality and safety of foods, edible oil producers must have access to a laboratory. Only 15 edible oil factories reported having an internal laboratory (8 large scale factories and 7 medium scale factories). Of the 5 factories[6] that specify the types of laboratory equipment they have, 3 have the capacity to test for acidity and 4 can test various quality factors (slip melting point and / or spectrophotometry).

2.2.5 Employment

The edible oil industry employs over 3,000 individuals nationally, 77% of them male and 23% female. The sector is fairly split between hiring permanent (56%) versus temporary (44%) employees. This is likely due to the seasonal nature of oilseeds production and thus edible oil refining and processing.

Edible oil factories in Addis Ababa, Benishangul-Gumuz, Harari, and SNNP Regions have the greatest proportion of large scale to total factories and thus employ more people on average per factory, as shown in Table 3.

Table 3: Employment in the Edible Oil Industry

Region	# of Employees	Average Employees per Factory	# Small Scale Factories	# Medium Scale Factories	# Large Scale Factories
Addis Ababa	1,059	28	12	18	8
Amhara	411	12	12	21	0
Oromia	1,422	9	36	109	7
Other	293	73	0	1	3
Total	**3,185**	**14**	**60**	**149**	**18**

2.3 Packaging and Distribution

Understanding the types of packaging and distribution channels can provide some insights into the population that has access to and may be consuming the various types of edible oils. This will be important for prioritizing support for fortification within the industry to maximize the reach and impact among vulnerable populations.

2.3.1 Packaging Sizes Available

Many kinds of packaging are used for edible oils, including tin cans, glass bottles, PET or HDPE plastic bottles, and paper cartons. Of the 227 assessed edible oil factories, 21 reported the packaging sizes they use. Most factories sell their edible oil in a variety of packaging sizes. Over 70% of factories package their oil in ½ and 1 Liter containers. Around half package in 3 or 5 Liter containers. Fewer than 15% package in 10, 20, and 25 Liter containers or package in barrels. No small-scale factories package in sizes greater than 5 Liters, except for one reporting packaging in barrels.

[6] These are from 3 large scale and 2 medium scale factories.

2.3.2 Geographic Distribution of Products

Nearly all edible oil factories distribute their products in local markets or to Addis Ababa. Only one of the 102 factories reporting their geographic distribution sell their products nationally, and this factory is based in Addis Ababa. All reporting factories located in Amhara Region distribute only locally. Half of reporting factories located in Oromia Region distribute locally and half distribute in Addis Ababa.

2.3.3 Distribution Method

Of the 219 edible oil factories reporting the method of distribution, 67% sell their products directly to consumers through markets or retail outlets and 43% sell wholesale. One edible oil factory located in Addis Ababa reported selling directly to an NGO for distribution. The distribution method. Over 90% of all factories reporting selling wholesale are located in Oromia Region.

2.4 Challenges Faced by Factories

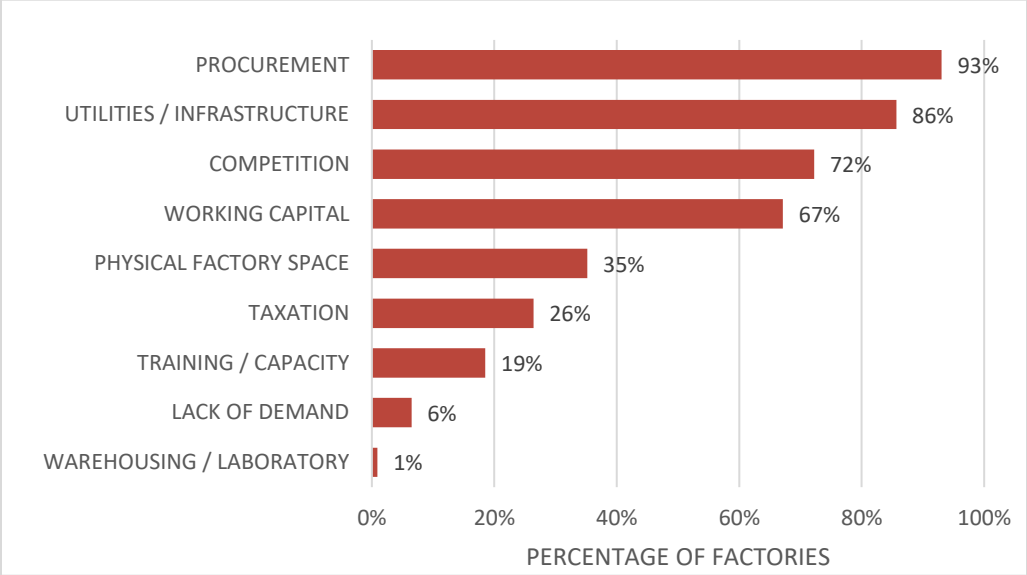
Edible oil processing factories report facing many challenges to their operations. These are shown below in Figure 9. The top four challenges faced by over half of factories include:

1. Procurement, including raw materials, equipment and spare parts, and packaging materials;
2. Utilities and infrastructure, including consistent electric and water supply and availability of roads for shipping and distribution;
3. Competition, mainly from palm oil, which is government subsidized, and from illegal imports; and
4. Availability of working capital and foreign currency to purchase inputs and invest in factory improvements.

Fewer than half of factories also reported the following challenges:

1. Lack of physical factory space as many of the factories were operating out of rented houses and could not expand their operations;
2. Unfair taxation practices, where some types of oil must pay VAT and others don't; lack of government support to the oil industry;
3. Lack of appropriately trained and capacitated staff;
4. Lack of consumer demand for products; and
5. Lack of warehousing and laboratory space.

Figure 9: Challenges Faced by Edible Oil Factories



2.5 Fortification Knowledge

Fats and oils are widely used as a delivery vehicle for micronutrients. Edible oils are a major component in a population's diet and provide a suitable matrix, especially for fat soluble vitamins (A, D, and E), which can be easily distributed in the oil. The Ethiopian national food consumption survey reported that 56.6% of women at child bearing age and 41.3% young children consumed fortifiable edible oil

Among assessed edible oil processing factories, 90% had no knowledge or awareness about food fortification. Nine factories (4%) had detailed knowledge of fortification, while 14 factories (6%) had average knowledge. This is shown in Figure 10. Table 4 displays fortification knowledge disaggregated by factory size. Only medium and large-scale factories have any fortification knowledge.

Currently it is known that two edible oil refineries are fortifying edible oil on demand with retinol palmitate (vitamin A). According to an officer in charge of edible oils within the Food, Beverages, and Pharmaceutical Industry Development Institute, there are some initiatives already that spark optimism for large scale fortification of edible oils. In Adama and Bahir Dar, small millers or crushers[7] are organized in clusters or cooperatives already to refine edible oils. In addition, several large edible oil processing factories are under construction or in a pilot phase (located in Bahir Dar, Debre Markos, Burie, Wolkitie, Sebeta, and Dire Dawa). These large-scale factories have a designed production capacity greater than the annual edible oil demand within Ethiopia.

[7] Crushers produce crude vegetable oil, which is supplied to other edible oil factories to refine.

Figure 10: Fortification Knowledge Among Edible Oil Factories

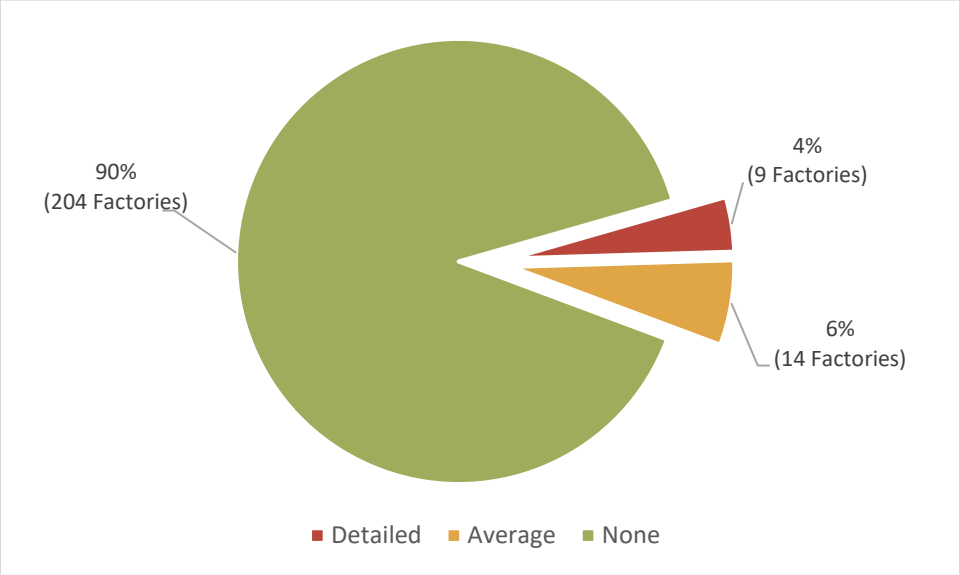


Table 4: Fortification Knowledge Among Each Size of Edible Oil Factories

Size	Detailed Knowledge	Average Knowledge	No Knowledge
Small	0	0	60
Medium	3	12	134
Large	6	2	10
Total	**9**	**14**	**204**

Appendix 3 provides selected data from large-scale edible oil factories.

3. Recommendations

Although edible oil refining is not a new sector in Ethiopia, there are currently very few edible oil factories with the knowledge, technical and equipment capacity, human resources, and supply chain required to expect fortification of edible oils to flourish. Most edible oil factories, regardless of size are being underutilized and not operating at full capacity. In addition, the dominance of imported palm oil, hinders local production of edible oils.

Based on the results of this edible oil industry mapping, the following are recommendations for next steps in the development of the local edible oil industry. These recommendations are to ensure industry readiness and justification for such support on the basis on the potential impact of edible oil fortification. Voluntary standards for edible oil fortification have been approved as of April 2018 and thus is it critical to develop an implementation strategy with stakeholders in industry, government, civil society, and development partners.

Recommendations for Strengthening the Edible Oil Industry and Moving towards Edible Oil Fortification

1. Focus on activities to benefit large-scale and larger medium-scale producers with the potential to produce, distribute, and market significant volumes of fortified edible oils to benefit local communities.
2. Engage in activities that complement and support cooperatives or other clusters of smaller-scale producers who could refine and fortify oils centrally.
3. Conduct training and skill building among edible oil factory employees, especially in basic fortification knowledge, food safety, and QA/QC, following internationally recognized food safety and quality management systems.
4. Focus along the oilseed value chain to support access to quality inputs and linkages between oilseed farmers and producers with edible oil processors and refiners.
5. Engage with edible oil importers and customs/import control authorities to request and ensure that imported oils destined for human consumption are being fortified according to Ethiopian standards.

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Appendices

Appendix 1: OIL PROCESSORS MAPPING TEAM

This study has been conducted by the Ethiopian Food, Beverage and Pharmaceutical Industry Development Institute (FBPIDI) in partnership with the Global Alliance for Improved Nutrition (GAIN), based on the 5-year plan of action for fortification of edible oil.

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Eyoel Legesse, Team Leader Seble Daniel, Team Member Shemels Tilahun, Team Member ShelemeBermechu, Team Member Tesfay Tafesse, Chauffeur	Tamrat Tessma, Team Leader Eleni Asnake, Team Member Keder Keberu, Team Member Feysel Jemal, Team Member Fikru Abebe, Team Member Abi Ayela, Chauffeur	Dibaba Natea, Team Leader Berhanu Rgassa, Team Member Girma Abebe, Team Member Asrat Ayalew, Team Member Alemu Hylemariam, Team Member Moges Agidew, Chauffeur

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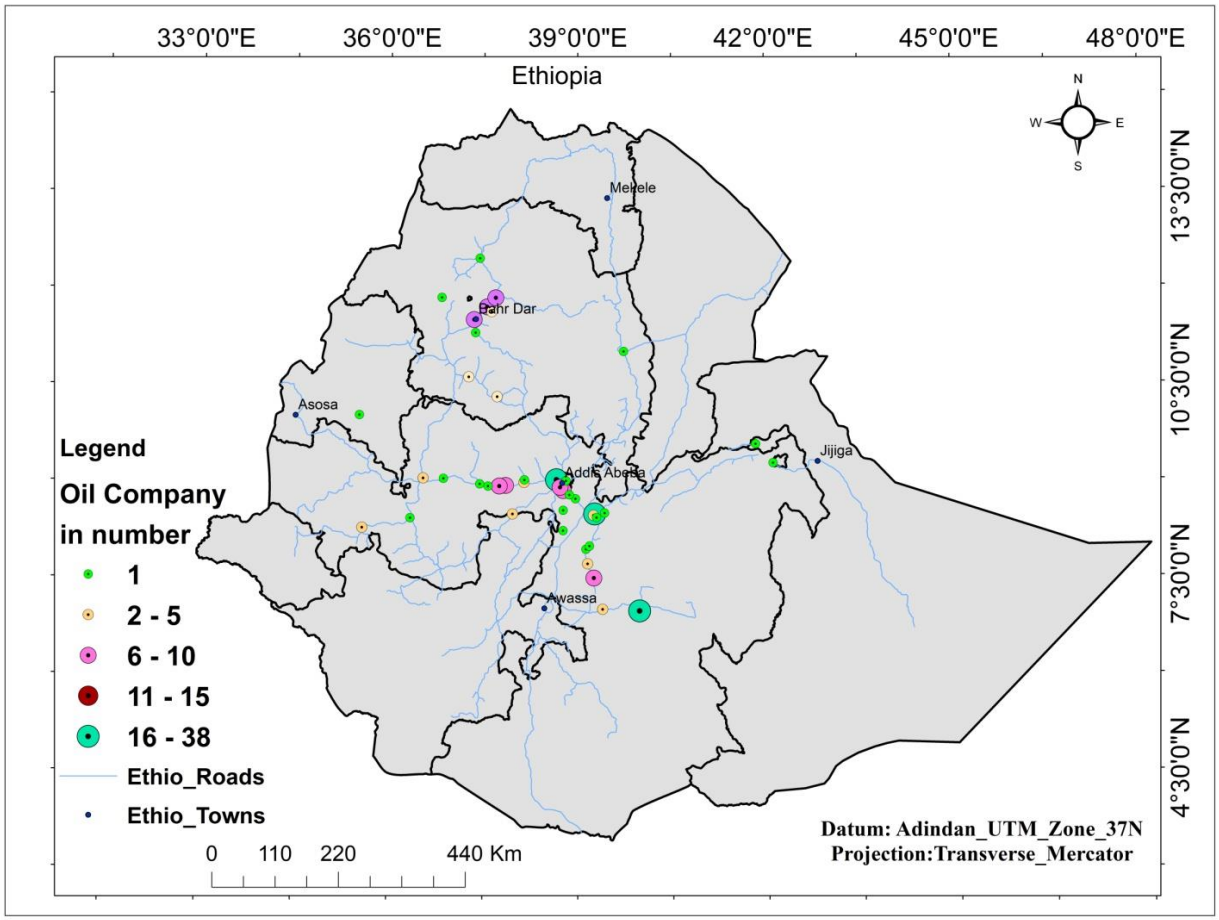
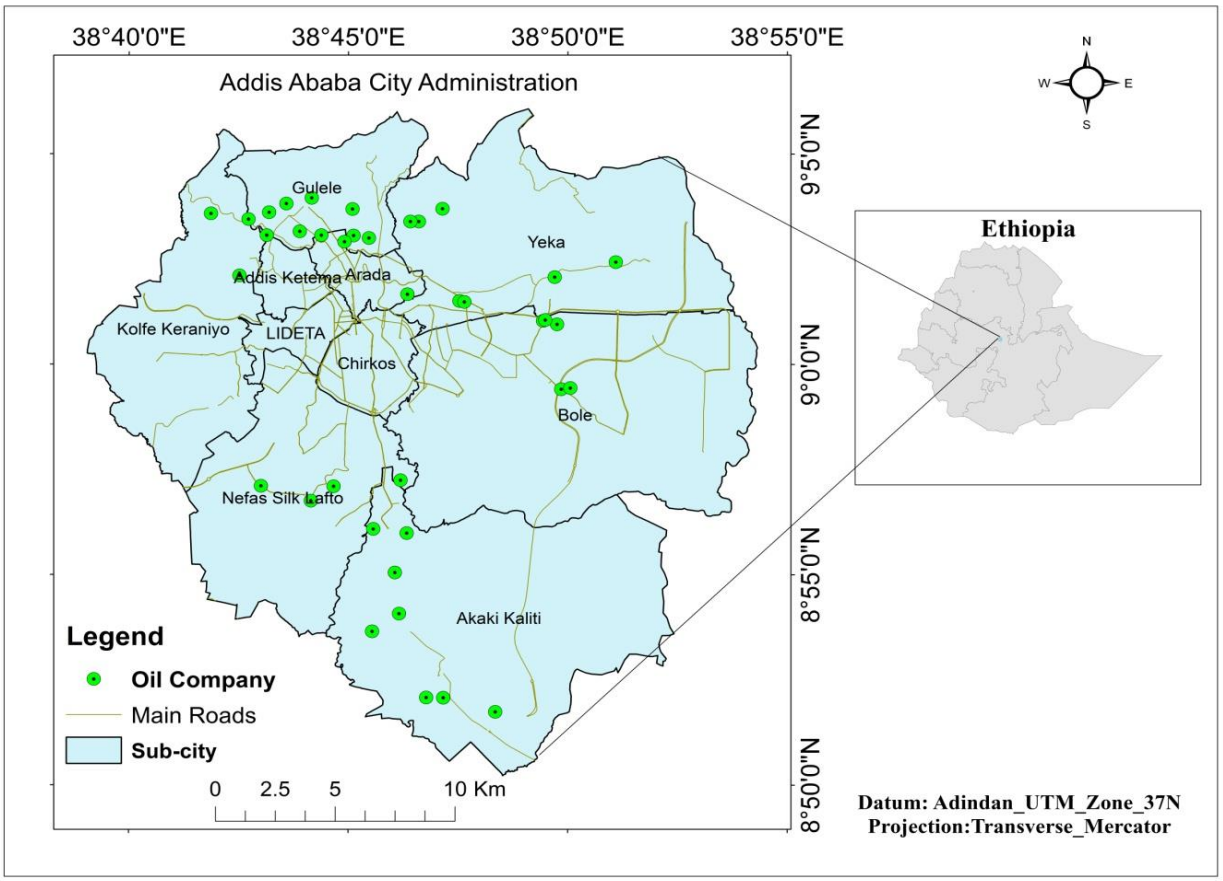
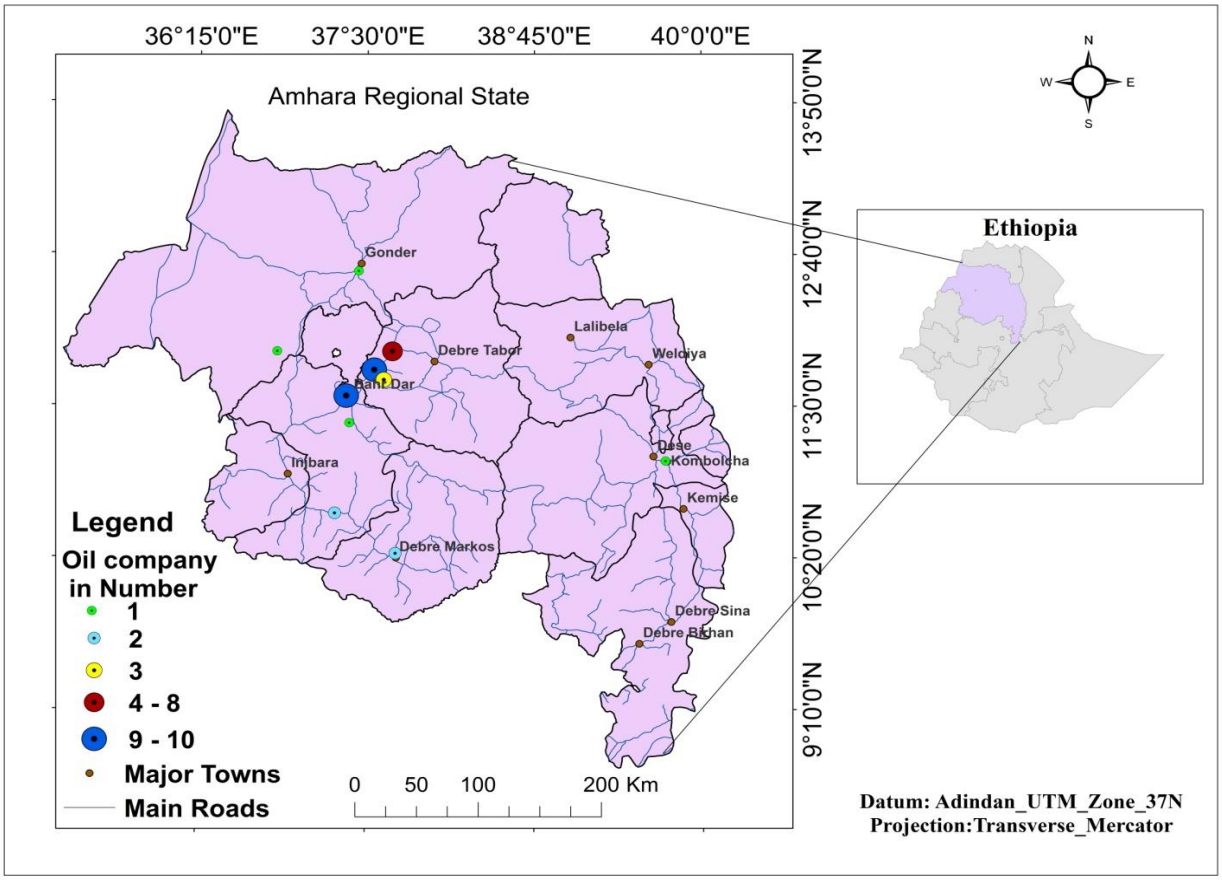
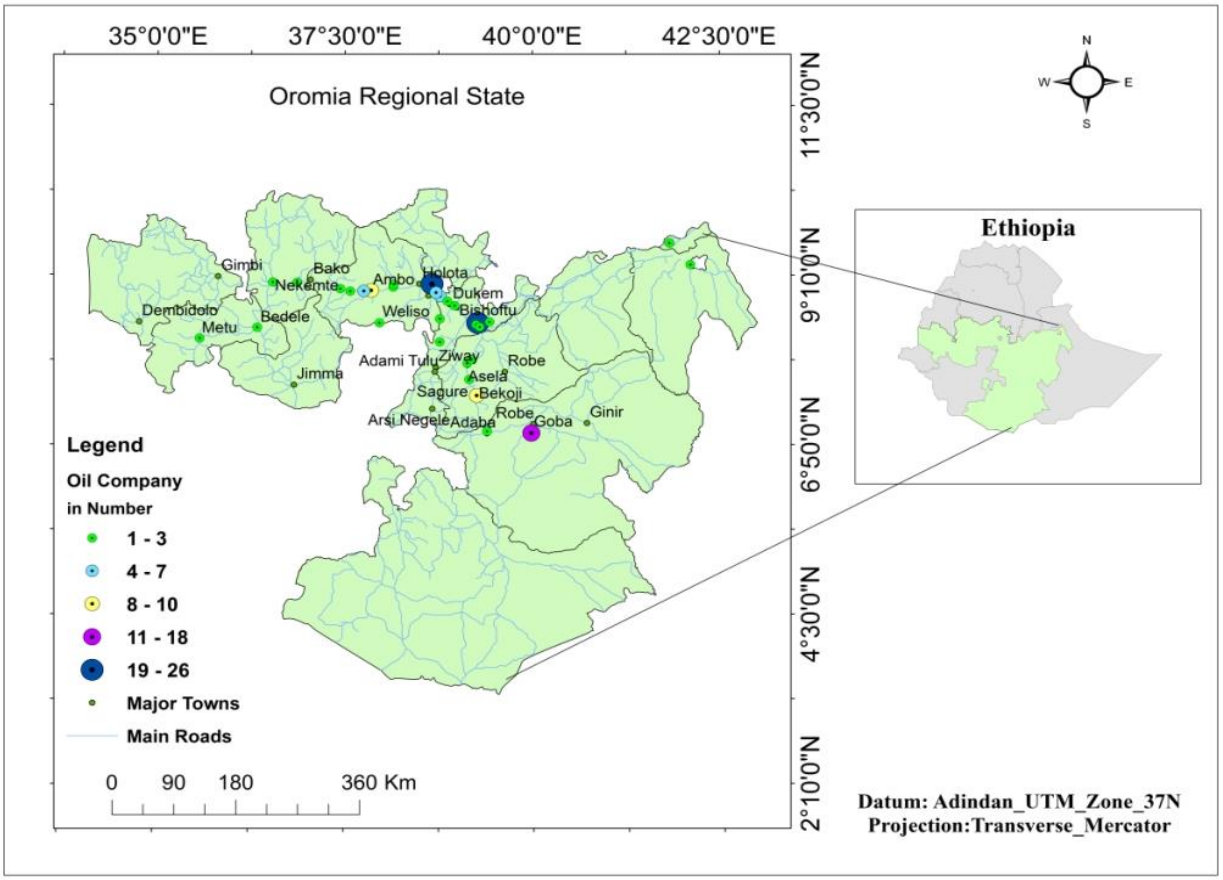
Appendix 2: Geographic Locations of Edible Oil Factories

The following maps show the geographic locations of edible oil processing factories in the country with details for the various high-density regions (Addis Ababa City, Amhara Region, and Oromia Region).




38°40'0"E
38°45'0"E
38°50'0"E
38°55'0"E
Addis Ababa City Administration
Gulele
Yeka
Addis Ketema
Arada
Kolfe Keraniyo
LIDETA
Chirkos
Bole
Nefas Silk Lafto
Akaki Kaliti
9°5'0"N
9°0'0"N
8°55'0"N
8°50'0"N
N
W
E
S
Ethiopia
Legend
Oil Company
Main Roads
Sub-city
0 2.5 5 10 Km
Datum: Adindan_UTM_Zone_37N
Projection:Transverse_Mercator


36°15'0"E
37°30'0"E
38°45'0"E
40°0'0"E
Amhara Regional State
Gonder
Lalibela
Debre Tabor
Weldiya
Bahir Dar
Dese
Kombolcha
Injibara
Kemise
Debre Markos
Debre Sina
Debre Birhan
13°50'0"N
12°40'0"N
11°30'0"N
10°20'0"N
9°10'0"N
N
W
E
S
Ethiopia
Legend
Oil company in Number
1
2
3
4 - 8
9 - 10
Major Towns
Main Roads
0 50 100 200 Km
Datum: Adindan_UTM_Zone_37N
Projection:Transverse_Mercator


35°0'0"E
37°30'0"E
40°0'0"E
42°30'0"E
11°30'0"N
9°10'0"N
6°50'0"N
4°30'0"N
2°10'0"N
Oromia Regional State
N
W
E
S
Ethiopia
Gimbi
Bako
Nekemte
Ambo
Holota
Dukem
Bishoftu
Weliso
Dembidolo
Metu
Bedele
Jimma
Adami Tulu
Ziway
Robe
Asela
Sagure
Bekoji
Arsi Negele
Adaba
Robe
Goba
Ginir
Legend
Oil Company
in Number
1 - 3
4 - 7
8 - 10
11 - 18
19 - 26
Major Towns
Main Roads
0 90 180 360 Km
Datum: Adindan_UTM_Zone_37N
Projection:Transverse_Mercator