Cocoa sector development in Ethiopia: Potential for impact and provisional road map

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SWRE-RAISE-FS-working paper # 015

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Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE FS)
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The working paper explores the potential for cocoa sector development in Ethiopia, leveraging its agro-ecological suitability across various regions. Ethiopia's cocoa sector strategy includes research capacity building, demonstration sites, scaling innovations, value chain development, attracting international investment, and enhancing governance. Lessons from West African countries and global market requirements must guide sustainable production and ecosystem preservation.

Keywords: cocoa, development, suitability, Ethiopia

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Contents

List of abbreviations and acronyms

CAGR	Compound Annual Growth Rate
MT	Metric Ton/Tonne
NGO	Non-Governmental Organization
RAISE-FS	Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems
CER	Central Ethiopia-CER
SER	Southern Ethiopia
SNNPR	South Nations, Nationalities and Peoples Region
QDS	Quality Declared Seed
QT	Quintal (which equals 100kg)
PICS	Purdue Improved Crop Storage
PLC	Private Limited Company
ToC	Theory of Change
SWR	Stichting Wageningen Research
WCDI	Wageningen Centre for Development Innovation, Wageningen University & Research
WUR	Wageningen University & Research
USD	United States Dollars

Summary

This working paper presents the trends in the international cocoa markets along with the potential for cocoa sector development in Ethiopia considering the agro-ecological suitability, available existing research results, trends in the domestic production and imports while taking into account the challenges emanating from climate change and its mitigation, adaptation, and preserving the ecosystem. It also presents strategies for domestic cocoa sector development covering how to boost domestic production, value addition, and governance structure.

The trend in the global cocoa market indicates (i) the ever-increasing global demand with volatile prices, (ii) the concentration of production where the major suppliers of cocoa beans, with around half of the world's production, are Côte d'Ivoire and Ghana, (iii) the main importers of cocoa beans are those countries with advanced processing industry and these are the Netherlands, Malaysia, Germany and the United States, (iv) the key value chain actors are producers with a share of margin ranging from 6 – 7%, traders and grinders with a share of margin ranging from 7- 8%, and manufacturers and retailers with a share of margin ranging from 80 – 90%, (v) existence of three global market segments, namely commodity or bulk, bulk certified, and premium that serve different market needs and consumer preferences, (vi) emerging trend of the global cocoa market experiencing significant shifts driven by evolving consumer preferences, sustainability concerns, and the rise of ethical consumption. These trends require due attention in the design and promotion of the cocoa sector in Ethiopia as they impact the cocoa sector directly or indirectly.
The suitability analysis for cocoa production indicated considerable potential for its production estimated at 4.74 million ha of highly suitable and about 20 million ha when combined with moderately suitable areas covering Oromia, Benishangul Gumz, Amhara, South-West Ethiopia, Gambela, and Southern Regions (Central Ethiopia and Southern Ethiopia).

The Ethiopian Institute of Agricultural Research (EIAR) through its Tepi National Spices Research Centre has introduced a Forastero-type cocoa variety, which has been tested for adaptation, performance, and quality of the beans in the south-western part of Ethiopia. The results indicated the dry bean yield of the variety ranged between 0.4 to 0.78 t ha-1 with an average of 0.58 t ha-1. Compared to the global average of 0.4 t ha-1, the registered variety has a yield advantage of 45%.

Currently, cocoa production in Ethiopia is not practiced except for the experimental production with the Tepi Agricultural Research Centre. However, in the past decade, several domestic chocolate producers have started operations in the Ethiopian market. Most chocolate manufacturers produce compound chocolate, which is made using imported cocoa powder and locally produced vegetable oil. Because of the lower cost of these ingredients, compound chocolate products have a lower price and can serve a larger market. Linked with the stated domestic production potential, it is expected that its production will be promoted both under small-scale and commercial conditions. In this regard, the promotion of domestic production needs to consider the experiences of other countries mainly West African countries to give due attention to the sustainability of production and addressing global market requirements including the EUDR provisions.
In order to fully exploit the potential along with the presented experiences in other countries, Ethiopia needs to follow a strategic approach and sequenced interventions to ensure the cocoa sector development in the country does not have a negative impact on the diverse aspects of the prevailing production systems as well as forest cover and biodiversity. These strategic interventions are (i) capacitating and/or establishing a centre of excellence for cocoa research and extension promotion, (ii) establishing cocoa demonstration sites in the most suitable target woredas, (iii) scaling of cocoa innovations, (iv) cocoa value chain development, (v) promotion of international investment for cocoa production and processing and (vi) enhancing the governance and enabling environment of the sector.

1 Introduction

Although Ethiopia is situated in the tropical zone, its wide range of altitude, from below sea level to over 3000m above sea level, gives it a wide range of climates from humid tropics to alpine climates, where most types of typical temperate and tropic crops could be successfully grown (Alemu & Dagnew, 2008). This diversity has contributed to the introduction of new crops into the country that are playing a crucial role not only in ensuring food security but also in generating foreign currency earnings through export and import substitution. The most important recent introductions are rice, which has become one of the most important cereal crops contributing to food security and import substitution (Alemu et al., 2018); and floriculture, which is contributing significantly to Ethiopia's economic growth as a major export earner, generating foreign currency revenue estimated to generate about 80% of Ethiopia's earnings from horticultural crops, in addition to job creation (Martin, 2023).

In addition, the national agricultural research system has been together with CGIAR centres, actively engaged in introducing, testing, validating, and release of better-performing varieties of the different crops from all over the world that played crucial roles in enhancing agricultural production and productivity. Considering the availability of suitable agro-ecology, the Tepi National Spices Research Centre of the Ethiopian Institute for Agricultural Research introduced the Forastero cocoa variety and tested it for its adaptation, performance, and quality in the Southwestern part of Ethiopia. This resulted in the official registration of the first cocoa variety by the name of Forasterio-1 in 2020 for production in Ethiopia.
Cocoa (Theobroma cacao) is widely grown in humid and high-rainfall environments. The crop originated in northern America and became a dominant crop in Western Africa. It is a high-value crop being used in the processing industries for making chocolate bars, confectionery, beverages, and other industrial uses. Cocoa is mainly produced by smallholder farmers, which account for more than 80% of the global supply and requires improved technologies suitable for the end-use products and adapted to the local environmental conditions. Genetically it is an outcrossing crop, and the production is challenged by self-incompatibility and pollination inefficiency (Bekele & Phillips-Mora, 2019). The quality of the bean, specifically the flavour quality for the end-use product, depends on the genetic factors, soil type, and age of the tree as well as the postharvest handling of the beans such as pulp pre-conditioning, fermentation, and drying, as well as roasting (Kongor et al., 2016). This implies the usefulness of appropriate improved technologies, capacity to support the value chain, and work with the different actors for sustainable return for investment.
The global market report indicates that cocoa is a major raw material for the chocolate industry, which reached a retail value of USD 100 billion in 2021 by engaging an estimated 5 million to 6 million cocoa farmers and supporting the livelihoods of 40 million to 50 million people who work for industries reliant on cocoa to produce their end products (Bermudez et al., 2022). Though cocoa's importance as an export commodity has been well recognized globally, the association of cocoa production with deforestation, land degradation, and loss of biodiversity has become a serious challenge for the promotion of cocoa production (Amiel & Laurans, 2019; Sassen et al., 2022).

This working paper explores the potential of promoting cocoa production and processing in the country building on the key lessons from experiences of other countries with developed cocoa industries with due emphasis on (i) the extent of availability of suitable agro-ecology through suitability mapping approach, the on-going efforts in research, the market potential and associated livelihood improvement, and (ii) what needs to be done to exploit the potential by providing key strategic measures that ensure sustainability without impact of deforestation, land degradation, and loss of biodiversity.

2 Trends in International Cocoa Markets

Cocoa production: Global cocoa production in 2022 was nearly 7 million metric tonnes. Cocoa is mainly grown in West Africa, with around half of the world's production that comes from Côte d'Ivoire and Ghana. This makes these two countries the most influential players in global cocoa markets and changes in supply have significant effects on worldwide cocoa prices. After those two, Nigeria and Cameroon are Africa's next-largest cocoa producers. As indicated in Figure 1, about 40% of global cocoa production originates outside of Africa, mostly in Asia (Indonesia), Oceania (Papua New Guinea), Central America (Mexico) and South America (Ecuador and Brazil).

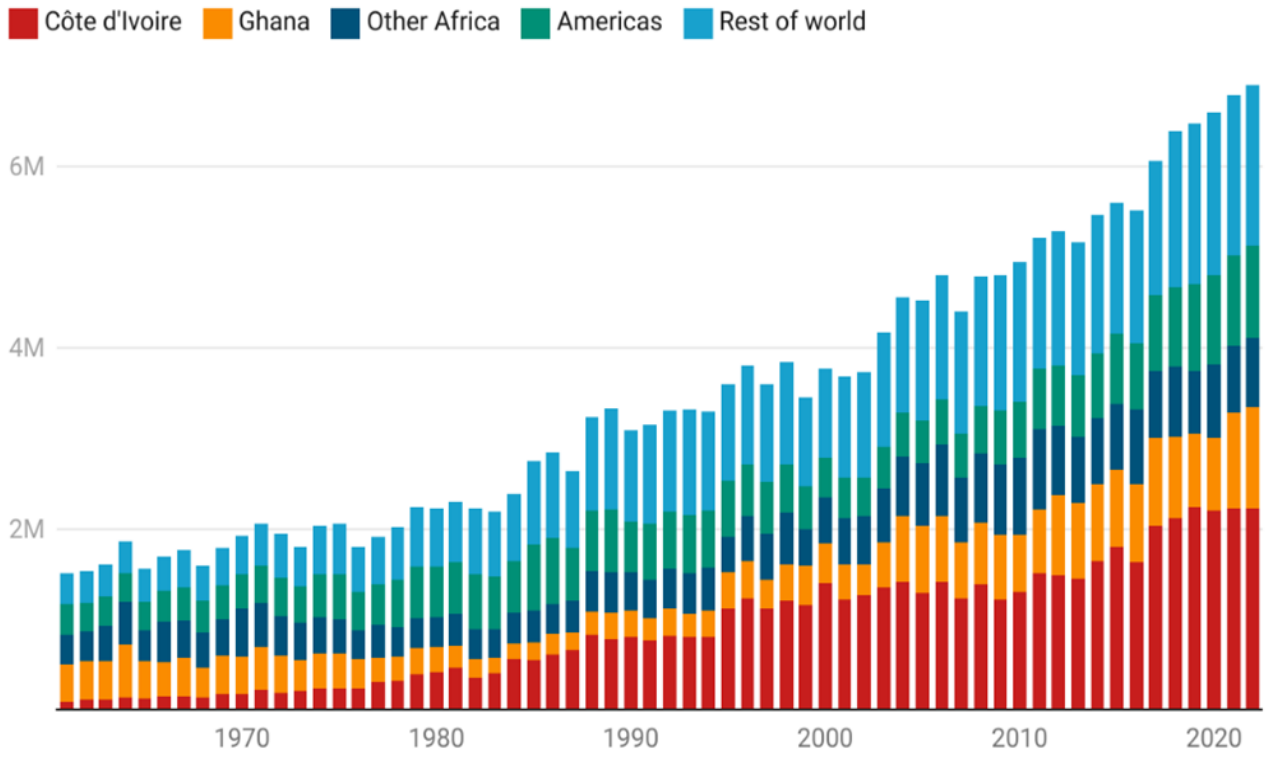

Figure 1 Trends in global cocoa bean production by country (t)
Source: FAOSTAT (https://www.fao.org/faostat/en/#data/QCL)

The main varieties of cocoa (*Theobroma cacao*) in the world are (i) Forastero from the Amazonas region, grown mainly in West Africa as bulk cocoa, (ii) Criollo, which is rarely grown because of disease susceptibility, (iii) Trinitario, which is a hybrid of Forastero and Criollo, and (iv) Nacional with fine flavour, grown in Ecuador. Forastero varieties contribute to most of the global cocoa production and marketing with major producers being Côte d'Ivoire, Ghana, Indonesia, Brazil, Nigeria, Cameroon, and Ecuador, of which 60% of the global production is produced in Côte d'Ivoire and Ghana (Afoakwa, 2014).

Six shade canopy typologies can be distinguished in the major cocoa-producing regions. These are 1) cocoa without shade; 2) cocoa with a mono-specific 'service' shade, that is, with a legume tree species of the genera Erythrina, Gliricidia, Inga or Albizia, 3) cocoa with one or a few productive shade tree species such as fruit trees e.g banana, timber trees, rubber (*Hevea brasiliensis*) or taro 4) cocoa with mixed shade, 5) rustic cocoa, also known as 'cabrucas' in Brazil, and 6) successional agroforests (Fujimoto, 2009; Somarriba et al., 2018).

Cocoa Trade: The market for cocoa and chocolate is growing globally. The global cocoa beans market was valued at USD 16 billion in 2023 and is expected to grow by almost 7% per year to over USD 22 billion by

2028. The global industrial chocolate market is expected to grow at an average annual rate of 4.4% in 2022-2030. The European chocolate market was valued at €42 billion in 2022 and is expected to grow at an average annual rate of around 4.8% in 2022-2027 (CBI, 2024).

Traders source cocoa beans (and sometimes derivatives) from cocoa-producing countries, operating across various origins and serving a diverse client base. Their services in the cocoa value chain include logistics, customs clearance, documentation, risk management (related to sourcing, pricing, and exchange rates), and quality control. Some traders specialize in particular market segments, such as organic, organic plus fair trade, or specialty cocoa, while others focus on importing from specific origins. Occasionally, importers also own cocoa farms or subsidiaries in certain regions (ibid).

As indicated in Figure 2, the Netherlands stands as the largest cocoa importer worldwide, importing about 2.18 Billion USD followed by Malaysia with a value of about 1.5 Billion USD, Germany with 877 million USD and the United States with about 804 million USD in 2023 (Statistica, 2024).

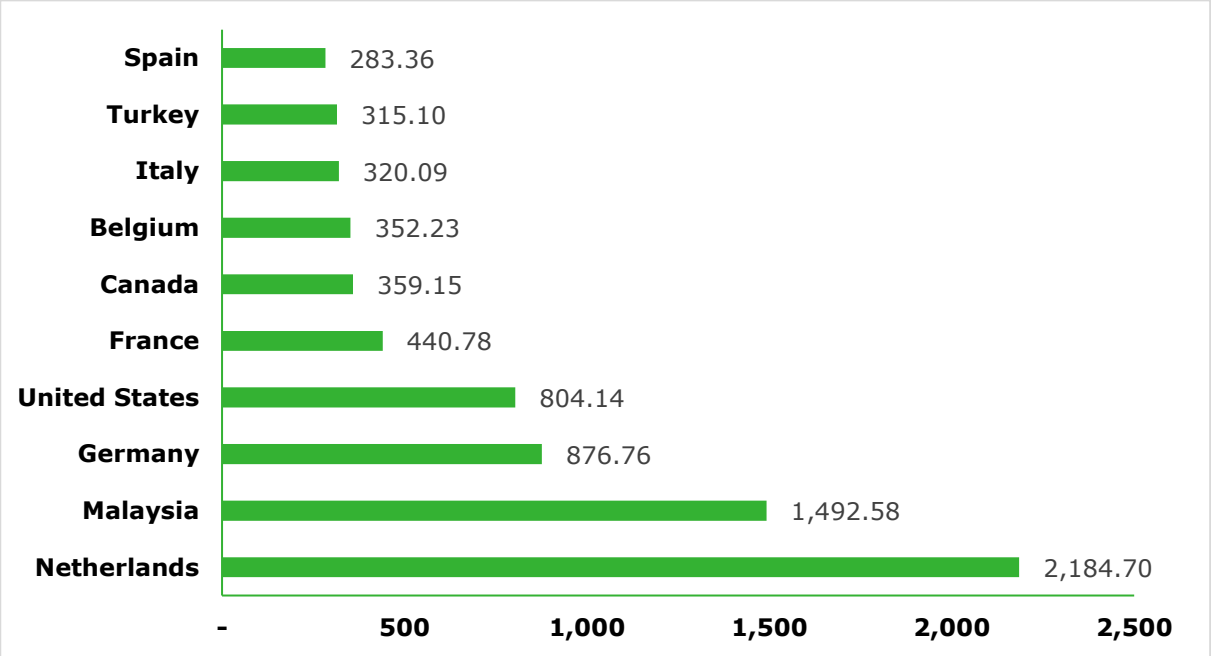

Figure 2 Value of import of cocoa beans in Million USD, 2023
Source: Statista (https://www.statista.com/statistics/1112363/global-leading-importers-of-cocoa-beans/)

The cocoa trade involves numerous companies, making it difficult to estimate their exact number; however, the major producing countries, Côte d'Ivoire and Ghana, have strong cocoa boards that determine price and volume. Cocoa beans are traded multiple times before they reach the point where they will be processed. However, the number of traders in the premium segment is generally lower than those in the bulk and bulk-certified segments, due to the smaller volumes and specialized nature of the business (Glauber and Mamun, 2024).

Major players in bulk and bulk-certified cocoa trading include Albrecht & Dill, Cocoanect, Dietz Cacao Trading, Facta International, Huyser Moeller, Kemofina, Theobroma, and Walter Matter. Key players in premium cocoa trading are Bohnkaf Kolonial, Crafting Markets, Daarnhouwer, Le Cercle du Cacao, Meridian Cacao, Silva Cacao, and Uncommon Cacao (Gaia Cacao, 2021).

Global cocoa prices: For the past 10 years cocoa prices have stayed roughly between $2000-3000 per metric tonne (Figure 3). In 2023/2024 cocoa prices have surged to new heights. In April 2024, the price of a tonne of cocoa was about USD 10,000 (IMF, 2024). The sharp price increase follows a drop in supply from Côte d'Ivoire and Ghana, which have suffered large losses due to excessive rainfall and black pod disease, caused by a fungus that attacks pods and trees (Glauber and Mamun, 2024).

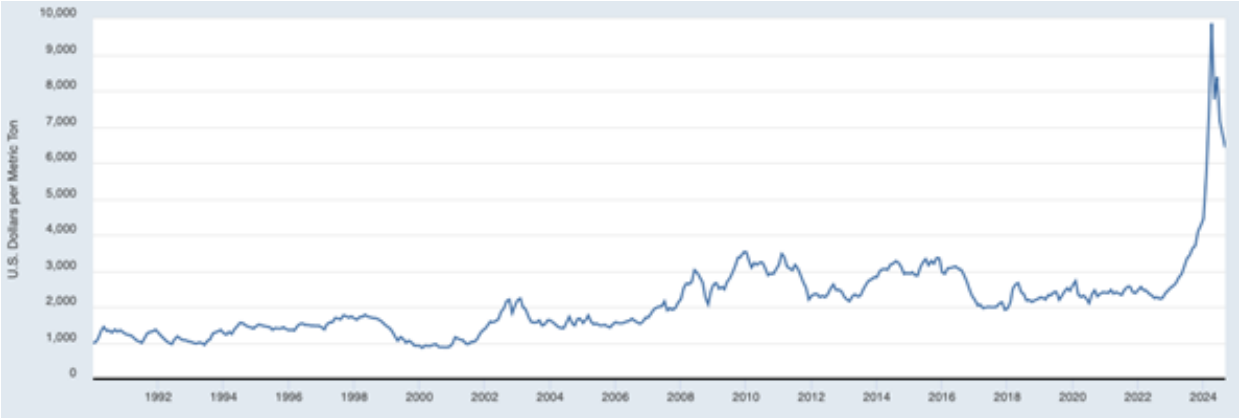

Figure 3 Trends in cocoa bean price, Jan 2019 – Sept 2024 (USD/MT)

Source: International Monetary Fund, Global price of Cocoa [PCOCOUSDM], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PCOCOUSDM, November 14, 2024.

While cocoa prices are expected to come down again if normal weather patterns return, there are structural issues that impact global cocoa supply. Climate change is making weather patterns more volatile, increasing the likelihood of more supply crunches. In the long term, climate change will cause large parts of the West African growing regions to gradually become unsuitable for growing today's cocoa varieties (Fountain and Hütz-Adams, 2022). Furthermore, West Africa's smallholder cocoa farms are often old, aging trees lead to lower yields and gold mining activities take over in the traditional cocoa-producing areas (Kuworno et al., 2018). Smallholder farmers often lack the financial means to invest in the rehabilitation of plantations (Wessel and Quist-Wessel, 2015).

Cocoa processing: The cocoa processing industry plays a crucial role in transforming cocoa beans into various derivatives such as cocoa paste, cocoa butter, and cocoa powder. These products are distributed to several industries, including confectionery, food, cosmetics, and pharmaceuticals, on a global scale.

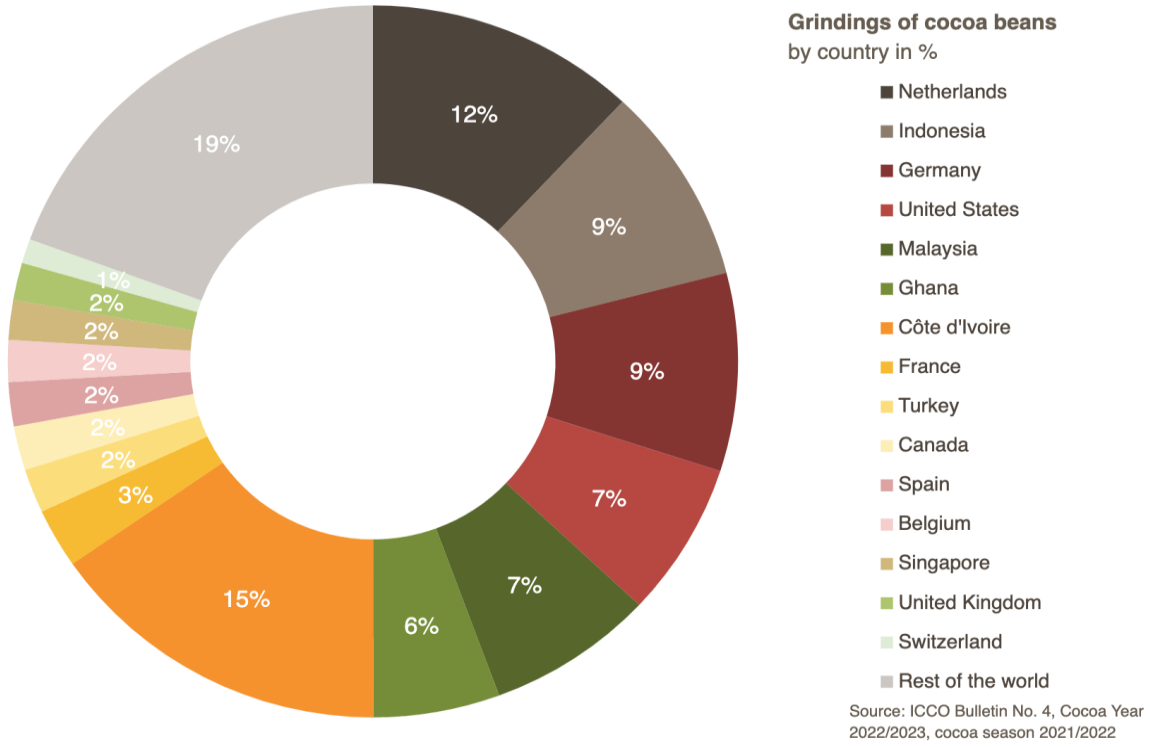

Figure 4 Figure 4 Share of countries in cocoa bean processing (2022)

Source: ICCO Bulletin No 4, 2022/2023

Grinders, also known as integrated processors, manage the entire supply chain from exporting and importing cocoa beans to the initial and secondary processing stages. The first processing stage involves converting cocoa beans into intermediate products like cocoa paste, butter, and powder, which are then sold to companies in consumer markets. These companies use the derivatives in manufacturing their final products. Some grinders extend their operations to the second stage of processing, producing chocolate couverture. Due to high capital costs for setting up factories, grinders generally operate at large scales, processing high volumes of cocoa beans into different derivatives. While smaller grinders handle approximately 10,000 to 20,000 metric tons annually, larger multinationals can process up to one million metric tons (Gaia Cacao, 2021).

Three major players dominate the grinding industry: Olam, Barry Callebaut, and Cargill. Olam is a bean-to-cocoa product company, Barry Callebaut is a bean-to-chocolate company, and Cargill is between these two models. These large-scale companies have strategically located factories in primary cocoa-producing countries, as well as in Europe and the United States (ibid).

As shown in Figure 4, Côte d'Ivoire and the Netherlands are the two biggest processors of cocoa beans worldwide. In 2022/23, Ivory Coast processed around 793,000 tons of cocoa beans which equals around 15% of worldwide grinding. Nearly 1.4 million tons of cocoa beans were processed in Europe, with the Netherlands accounting for the largest share.

Manufacturing: In terms of chocolate production, Germany, Belgium, Italy, and Poland lead the global market, collectively accounting for over 40% of global chocolate exports. The top six chocolate manufacturers – Mondēlez International, Nestlé, Mars, Hershey's, Ferrero, and Lindt & Sprüngli – produce 40% of the world's chocolate products (Gaia Cacoa, 2021)

Beyond these multinationals, the chocolate manufacturing market is highly fragmented, with a significant number of small-scale chocolate makers. In 2017, there were approximately 450 small-sized chocolate makers globally, with production volumes ranging from less than one ton to a maximum of 200 metric tons per year. Recent data suggests this number has more than doubled, with over 1,000 craft chocolate makers now in existence, primarily concentrated in the United States and Europe. These small chocolate makers collectively absorb between 8,000 to 10,000 metric tons of cocoa (ibid).

Ghana is an increasingly active participant in the cocoa value chain, with nearly 25% of its cocoa beans processed locally during the 2009/10 season by both state-owned and private companies. While Ghana does produce chocolate bars at the Cocoa Processing Company factory in Portem, local chocolate production remains limited compared to the extent of cocoa grinding. The Ghanaian government aimed to increase the share of origin grinding to 40% by 2012, with a long-term goal of reaching 60%. Meanwhile, Côte d'Ivoire is rapidly becoming the world's largest cocoa grinder. In October 2010, the country opened the world's largest cocoa processing facility, and private sector companies like ADM, Cargill, and Barry Callebaut are leading the expansion of grinding capacity, with more than 300,000 tons processed annually (ibid).

Cocoa butter is not just used for making chocolate, but also as an input for the cosmetics and pharmaceutical industry. Renowned for its moisturising properties, cocoa butter is a vital ingredient in numerous cosmetic formulations.

Value addition and marketing margins: Manufacturers and retailers earn the most from selling chocolate, while farmers earn by far the least (Figure 5). In some European value chains, retailers capture, on average, 70% of the total value of a dark chocolate bar and 90% of the overall margins. Meanwhile, farmers receive only about 11% of the final price and less than 7% of the margins for the same product. Profit margins for traders and grinders are reportedly low, ranging between 7% and 8%, but they are offset by the large volumes of cocoa they handle.

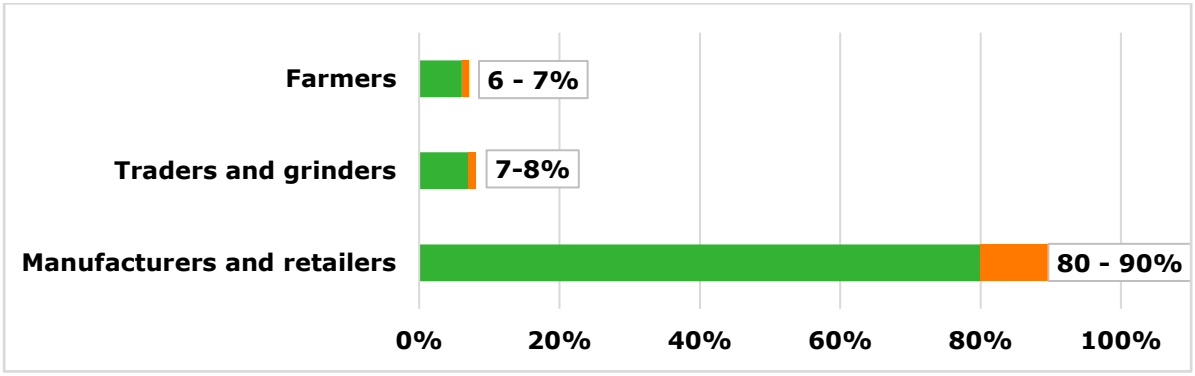

Figure 5 Share of margins generated by a tablet of dark chocolate in 2018, by value chain actor.

Source: Gaia Cacao, 2021

The higher value generated further down the supply chain is largely due to intangible assets such as brand reputation, marketing, product development, and differentiation. These elements tend to outweigh the significance of cocoa origin, the efforts of farmers, and the value of sustainable agricultural practices that benefit natural resource conservation and community well-being.

Farmers who sell specialty or fine-flavour cocoa through direct trade – establishing direct relationships with grinders or importers and avoiding intermediaries – typically earn higher farm gate prices. Additionally, buyers involved in direct trade tend to be more transparent, often sharing their pricing data for each transaction along the value chain (Bermudez et al., 2022).

Global cocoa demand: The global cocoa market is experiencing significant growth, driven by rising demand for cocoa and its derivative products. The market size for cocoa beans is estimated at USD 17.24 billion in 2024 and is projected to reach USD 23.97 billion by 2029, growing at a compound annual growth rate of 6.81% during the forecast period (2024-2029).

The global demand for cocoa derivative products, which includes cocoa paste, cocoa butter, and cocoa powder, was valued at USD 24 billion in 2019. This demand is forecasted to grow at an annual rate of 0.5 percent to 1.5 percent in the coming years. In 2019, the consumption of cocoa derivatives was approximately 3.5 million metric tons. By 2025, the demand for cocoa powder is expected to surpass 1,100 thousand metric tons, and that for cocoa liquor and paste is forecasted to exceed 1,200 thousand metric tons (Gaia Cacao, 2021).

The growing demand for cocoa is also driven by its expanding applications across various industries, including confectionery, food and beverages, cosmetics, and pharmaceuticals. As the global population increases and disposable incomes rise, particularly in emerging markets, such as South Korea, Japan, India, and China, the appetite for luxury items such as premium chocolate is expected to increase (Beg et al., 2017).

Market Segments According to the Global Cocoa Market Study (Bermudez et al., 2022), the chocolate market can be divided into three main segments: commodity or bulk, bulk certified, and premium. Each segment serves different market needs and consumer preferences.

The commodity or bulk segment is the largest worldwide. In Europe, it makes up over 90% of the total chocolate market. This segment is characterized by high volume and low-cost production. The market is highly price-oriented, closely following international commodity prices, and offers limited possibilities for value addition. This segment is suitable for exporters who can supply large volumes of cocoa beans at standard qualities.

The bulk certified segment also falls under the broader bulk market but emphasizes certification. This market follows the same price-oriented dynamics as the commodity segment but increasingly requires certifications such as Rainforest Alliance, Fair Trade, and Organic for market entry. The demand for certified cocoa is driven by the stricter sustainability protocols of manufacturers and retailers in Europe, who seek to ensure that their products meet ethical and environmental standards.

The premium segment is characterised by superior quality and/or value compared to bulk cocoa. Price premiums are paid above the world market price based on characteristics such as quality and flavour, unique origin, the story behind the way it is produced, and (certified) environmental and socio-economic sustainability of the product. The premium market is much smaller than the bulk segments, but it is the fastest growing. The global premium chocolate market was valued at USD 30.40 billion in 2022 and is expected to reach USD 67.96 billion by 2031, with a compound annual growth rate (CAGR) of 9.35% over the forecast period (2023-2031) (Straits Research, 2024).

Emerging trends in international markets: The global cocoa market is experiencing significant shifts driven by evolving consumer preferences, sustainability concerns, and the rise of ethical consumption. Several key trends are shaping the market (especially in Europe and North America), including the demand for organic cocoa, the rise of single-origin chocolates, the growth of bean-to-bar production, the adoption of direct trade practices, and the continued expansion of Fair-Trade cocoa (CBI, 2024).
The demand and supply of sustainably sourced cocoa is rising globally. Major certification schemes include Rainforest Alliance (including UTZ), FairTrade, and Organic certification (Bermudez et al., 2022; Voora et al., 2019).

Especially the demand for organic cocoa has been growing rapidly, particularly in Europe, where supermarkets are expanding their range of organic products, often under private-label brands. Organic cocoa production must comply with stringent certification guidelines that prioritize the health of people, soils, and ecosystems.

Cocoa-producing countries in Africa are gradually shifting to developing international chocolate brands by promoting domestic processing and branding. Examples include Midunu Chocolates, '57 Chocolates, and MIA (Made in Africa) in Ghana, Le Chocolatier Ivoirien in Ivory Coast, Latitude Craft Chocolate in Uganda, and Savanna Chocolates in Zambia.

3 Potential for cocoa sector development in Ethiopia

Ethiopia holds significant potential for cocoa cultivation due to its agro-ecology, its extensive experience with similar commodities, and the availability of suitable agro-ecological zones, especially coffee production, processing, and export. For the production of cocoa, there is already a variety of cocoa, Forestero, registered for commercial use which if introduced sensibly in the western and south-western parts of the country. Cocoa can be cultivated in a climate-smart way with consideration for the environment especially its potential that does not negatively impact biodiversity. There is also a productive variety tested and verified for its yield potential and commercial quality standards.

In addition to these, cocoa production can help diversify rural livelihoods. The potential for import substitution and local value addition through domestic processing and chocolate manufacturing can supply the domestic market and generate jobs for unemployed youth and women. The export revenue and has the potential to create jobs and diversify rural livelihood opportunities from cocoa can also be exploited.
The potential of cocoa sector development in Ethiopia is presented here considering (i) the availability of suitable agro-ecology and accessibility to services, (ii) the availability of cocoa technologies and on-going research efforts, (iii) the potential for local processing, and (iv) expected positive impact on rural livelihoods and income.

3.1 Agro-ecological suitability and existing potential

To identify the existing potential for cocoa production in Ethiopia, an agroecological suitability mapping was done for the Forastero cocoa variety. This was complemented by mapping accessibility to key agricultural services as a proxy for socioeconomic factors.

The key factors used to define the criteria for land suitability analysis considered climate, soil, topography, and land use and cover. These criteria were prepared as layers using a weighted overlay analysis to generate the overall suitability map for rain-fed Cocoa production. This resulted in four categories of suitability classes: not suitable (N), marginally suitable (S3), moderately suitable (S2), and highly suitable (S1). The overall land suitability map represents the combined results of the altitude, slope, soil properties, and climate data layers.

Much of the suitable land for cocoa is found in the northwest, western, and south-western parts of the country (Figure 6a). The land suitability analysis revealed that the combined area of highly and moderately suitable land for cocoa in the country is 20.1 million hectares (ha), representing 17.7 % of the total area of the country. Benishangul Gumz, South-West Ethiopia, Gambela, Oromia, SNNP, and Amhara regions possess the largest area of highly suitable land (Table 1). Potential woredas have also been identified (see Annex 1).

Table 1 Performance, adaptation, and recommended agronomic practices for Forasterio-1

Region	High suitability		Combined high and moderate suitability	
	Million ha	%	million ha	%
Oromia	1.6	30.7	5.5	17.2
Benishangul Gumz (BGR)	1.4	35.9	4.8	94.6
Amhara	1.2	37.2	2.6	16.6
South-West Ethiopia	0.3	60.8	2.5	64.6
Gambela	0.2	3.1	2.3	72.0
Southern regions (Southern Ethiopia and Central Ethiopia regions)	0.04	0.3	2.2	35.3
Total	4.74		19.9	

Note: Southern regions refer to Southern Ethiopia and Central Ethiopia regions

However, to assess the extent of suitability accurately, the total area of each region needs to be considered. BSG has a large proportion (94.6 %) of its land being high to moderately suitable for cocoa, followed by SWEP (71.99 %), Gambela (64.62 %), and SNNP (35.29 %). The actual land available for cocoa production could be lower, as some areas might be in the production of other commodities or equally be suitable for other land uses. In addition, considering the forest coverage including the production of high-value crops like coffee and tea, the highly suitable area may be lower than estimated.

The travel time from suitable areas to the nearest road and settlement centres was mapped and considered as a proxy indicator for understanding the current accessibility conditions in areas that are found to be suitable for cocoa production. Long distances and long travel time associated with poor road networks potentially lead to damage, both to planting material as well as the harvest produce, during transportation, delay the input and produce delivery and induce higher transportation cost that reduces production efficiency. The cocoa sector development based on the identified suitable land could follow two broad production pathways. The first is production from private investors in commercial farms that could involve the use of relatively high inputs use and a structured value chain. The second pathway is the production of cocoa with smallholder farmers that usually are located dispersed. The product marketing in this approach involves collection from smallholder farmers across collection nodes and transporting to central facilities for processing for which road networks play an important role. In both cases, understanding the existing accessibility condition or the need to improve road access is an important component of the investment decision.

Comparing the two maps, agro-ecological suitability (Figure 6a) and access to roads (Figure 6b), it is evident while Benishangul Gumz appears to have the most favourable agro-ecological conditions for the establishment of cocoa, access to services is potentially one of the limiting factors. The same holds true for some of the other areas.

In practice, however, some areas represented as suitable may not be feasible to produce cocoa due to several reasons such as (i) the terrain might not be suitable for instance mountainous areas, (ii) competing claims of other crops for the land use driven by benefit or the push through extension system to meet food security objectives, (iii) suitable locations may be so isolated that they are difficult to reach for input supply and product collection, (iv) producer's preference due to socio-cultural issues on cocoa or competing crops, (v) technical challenges particularly for smallholder farmers.

Existing literature indicates that cocoa production is a major global driver of deforestation. For instance, the cocoa in Cote d'Ivoire, the world's largest cocoa producer, is reported to contribute to 2.4 million ha of cocoa deforestation and degradation over 2000–2019, i.e. 125 000 ha y^{-1}, representing 45% of the total deforestation and forest degradation over that period (Renier et al., 2023; Wainaina et al., 2021). This implies that the promotion of cocoa production only based on suitability may end up enhancing deforestation and degradation. Some countries like Ghana have been exploring different approaches including agroforestry cocoa systems are increasingly promoted as a possible solution to deforestation (Wainaina et al., 2021). Thus, it will be important to give due attention to how cocoa production can be promoted sustainably without being the driver of deforestation.

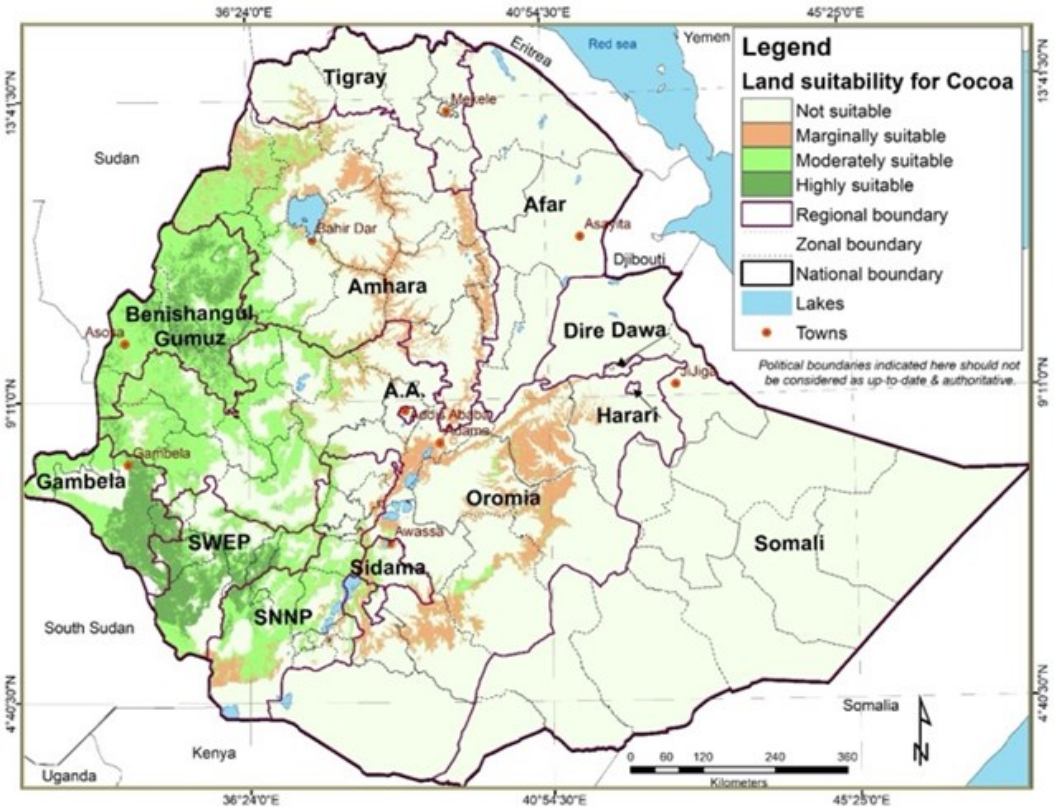

Figure 6.a Land Suitability Map for Cocoa Production

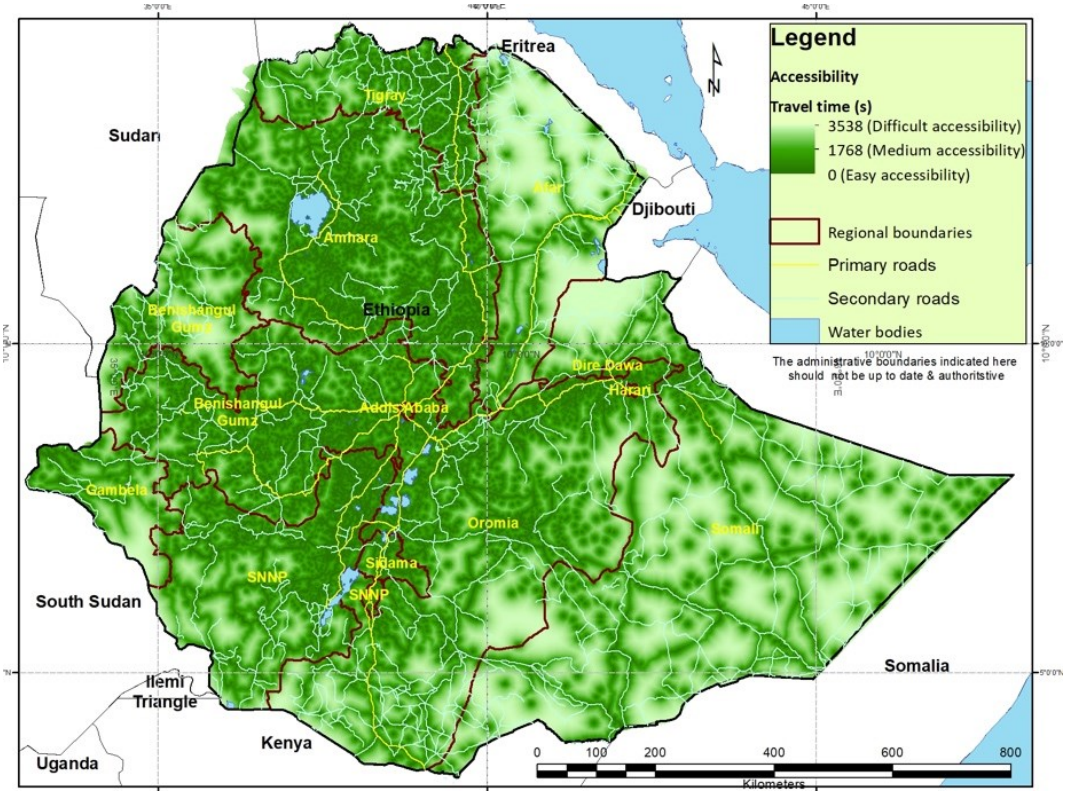

Figure 6.b Accessibility to Roads in Travel Time

3.2 Research and achievements

The Ethiopian Institute of Agricultural Research (EIAR) through its Tepi National Spices Research Centre has led the introduction and adoption of cocoa varieties. Accordingly, Forastero-type cocoa variety was introduced and tested for adaptation, performance, and quality of the beans in the south-western part of Ethiopia. The variety adapted and performed well at Tepi, Bebekka, and Gemadro. Based on the performance and other desirable agronomic traits the first cocoa variety was registered by the name of Forasterio-1 in 2021 for production in Ethiopia (EAA, 2021).

Based on the average data obtained from multiple locations covering Tepi, Bebeka, and Gemadro areas and years from 2017 to 2019, the registered variety has the attributes indicated in Table 2. The dry bean yield of the variety ranged between 0.4 to 0.78 t ha^{-1}, with an average of 0.58 t ha^{-1}. Compared to the global average of 0.4 t ha^{-1}, the registered variety has a yield advantage of 45%. The adaptability of the variety in terms of altitude, rainfall, and soil type, and the recommended agronomic practices in terms of spacing, number of seedlings (plants/ha), and planting date are presented in Table 2.

Table 2 Performance, adaptation, and recommended agronomic practices for Forasterio-1

Performance/ Adaptation	Trait/Indicators	Unit	Range	Mean
Performance	Plant height	cm	135 - 208	167
	Leaf length	cm	25 - 30	27
	Number of branches $plant^{-1}$	#	5 -19	10
	Number of pods $plant^{-1}$	#	12 - 27	22
	Pod weight plant-1	Kg	10 -16	13
	Hundred bean weight	gm	141 - 143	142
	Fresh bean weight plant-1	gm	570 - 1030	820
	Dry bean weight plant-1	gm	260 -490	372
	Dry Bean weight ha^{-1}	t/ha	0.4 – 0.78	0.58
Adaptation	Altitude (m.a.s.l)		1200 -1500	
	Rainfall (mm)		1678 – 1900	
	Soil Type		Cambisols	
Recommended agronomic practice	Spacing (m):	• 2.5 between plants; • 2 between rows		
	Seedling (Plant/ha)	1600 seedlings		
	Planting Dates	June to July depending on the onset of rainfall		

Source: EAA (2021)

3.3 Imports, emerging domestic production, and cocoa processing

During the past five years, Ethiopia on average imported between USD 4 -5 million or the equivalent of 625 tonnes of chocolate and cocoa-derived products (Trading Economics, 2024). Cocoa product imports peaked at $5.8M in 2019. In 2022, the primary countries cocoa products were imported from included Turkey ($1.3M), Netherlands ($1.16M), Germany ($0.5M), United Arab Emirates ($0.3M), and Switzerland ($0.3M) (OEC, 2024), indicating Ethiopia's reliance on a diverse set of international suppliers to meet its domestic needs.

Cocoa in Ethiopia is currently only produced on an experimental scale. As mentioned in the previous section, the Tepi National Spices Research Centre, has registered a Forastero cocoa variety which is now available for commercial cultivation. The research centre has multiplied over 10,000 cocoa tree seedlings for distribution to commercial growers. At the time of writing, a number of Ethiopian agribusinesses are assessing the suitability of their land to start large-scale commercial cocoa cultivation pilots.

In the past decade, several domestic chocolate producers have started operations in the Ethiopian market. Most chocolate manufacturers produce compound chocolate, which is made using imported cocoa powder and locally produced vegetable oil. Because of the lower cost of these ingredients, compound chocolate products have a lower price and can serve a larger market. Well-known brands include NIB Candy, Pronto

Chocolate, and Katakit, all with factories in or just outside of Addis Ababa. They produce products such as chocolate bars, dragées, and spreads, as well as large chocolate blocks used by bakeries and small-sized chocolatiers.

Recently, new companies have emerged that produce real chocolate. Real chocolate is manufactured using cocoa liquor and cocoa butter. These ingredients are more expensive but result in a higher-quality aroma, flavour, and texture. In 2017, Haredo LLC Chocolate established a factory at the Tatek Special Industrial Zone, just outside Addis Ababa. With a USD 5 million investment, machinery was imported to produce real chocolate using imported cocoa liquor and shea butter, mainly sourced from Tanzania (The Reporter, 2017). The company recently introduced chocolate bars and chocolate spread under a new brand called YENE, sold in several supermarkets, bakeries, and hotels. Several chocolatiers have also set up in Addis Ababa, such as Muhany Chocos & Sweets, producing artisanal chocolates on a small scale.

In August 2024, NIB Candy presented the world's first Ethiopian-grown chocolate bar (Figure 6). Using newly acquired bean-to-bar equipment, the company processed cocoa beans harvested from TARC's trial sites and created a pure chocolate bar with around 60% cocoa content.

Figure 6 The first chocolate bar produced from Ethiopian-grown cocoa by NIB Candy Factory

3.4 The South-West of Ethiopia as a starting point for introducing Cocoa

Ethiopia's South-West region is one of the most suitable regions for cocoa cultivation, not only due to its favourable climate but also due to its political stability and the presence of the Tepi National Spices Research Centre, which is conducting research, training, and awareness-raising activities around Mizan and Tepi.

The potential impact considering only the South-West region of the country is estimated based on the assumptions: (i) the estimated size of suitable land in the region based on the suitability mapping (see section 3.1), (ii) yield data from cocoa trials in Ethiopia, and (iii) published data sources (Table 3).

Table 3 Variables and estimated values considered

Variable	Units	Estimated Value	Source
Cocoa yield in Ethiopia	Dry cocoa bean weight in tons per hectare	0.56	Based on cocoa trials conducted in South-West region
World market price for bulk cocoa	USD per Metric ton	7,290	ICCO, 2024
Average cocoa labour requirement	Person-days per hectare per year	125	Fair Trade
Number of available work days at full-time employment	Days per year	230	Cocoa Barometer (Fountain, & Hütz-Adams, 2022)

According to the suitability map, the South-West region has over 1.4 million hectares of suitable land. Assuming only 1% of suitable land is cultivated (14,049 ha), this would yield approximately 7,868 tons of dry cocoa beans annually and generate around $57 million USD in revenue if sold at the current international market price as cocoa beans. In terms of labour and employment, cultivating cocoa on just 1% of the South-West region's suitable land would require about 2.95 million person-days of labour per year and could create 7,635 jobs (Table 4).

This back-of-the-envelope calculation demonstrates that even small-scale cocoa cultivation in the South-West region could gain substantial economic benefits. If expanded, the sector could play a critical role in regional economic growth, offering a promising avenue for job creation and income generation.

Table 4 Estimated economic contribution of cocoa

Indicator	Units	Ethiopia (x1000)	1% SW region
Total suitable land*	Hectares	20,080	14,049
Dry cocoa beans produced	Tons	11,244	7,868
Revenue generated	USD	81,974,592	57,354,291
Average labor	Person-days per year	2,510,000	1,756,145
Number of cocoa jobs	Persons per year	10,913	7,635

** Minus forested areas*

There are several limitations to the quantification of the economic contribution that cocoa can have for Ethiopia:

The current yield estimates for cocoa in Ethiopia are largely based on trials that have not incorporated the use of agricultural inputs or best practices but also do not reflect the agro-ecological differences across Ethiopia. As a result, these estimates may not accurately reflect the potential yields in different areas or yields that could be achieved under optimized conditions with proper input use, such as fertilizers and pest management.

To be environmentally sustainable, cocoa is often integrated into agroforestry systems (Pulleman et al., 2022), which can provide ecological benefits such as biodiversity conservation and soil health improvement. However, yields per hectare might be lower compared to monoculture systems, depending on the specific design and practices employed. Factors such as tree density, shade levels, and the compatibility of cocoa with other crops or trees in the system can influence productivity. Therefore, yields per hectare may turn out lower than is reported in conducted cocoa trials in Ethiopia.

There is often a significant gap between international cocoa prices and the prices that farmers actually receive at the farm gate. This disparity can be due to several factors, including transportation costs, intermediaries in the supply chain, and market inefficiencies. The revenue reported in the above calculation does therefore not reflect what farmers will earn from selling their cocoa.

As cocoa production in Ethiopia is still in its early stages, the potential for earning premiums from certification or unique characteristics has not yet been explored. Depending on certifications and premiums, the estimated revenue gained from cocoa sales could therefore turn out higher than reported.

3.5 Climate mitigation, adaptation, and biodiversity

Global experience indicates that the promotion of cocoa production needs to give due attention to climate mitigation, adaptation, and biodiversity issues. Agroforestry systems are increasingly recognized as a key strategy for climate mitigation and adaptation, particularly in regions facing significant climate challenges. By integrating shade trees into cocoa farming, these systems help buffer cocoa plants against extreme temperature fluctuations and droughts, which is critical in areas experiencing increased evapotranspiration and decreasing rainfall due to climate change. However, to fully realize the potential of cocoa agroforestry as a climate adaptation strategy, a more tailored approach is necessary. This includes selecting shade tree species that are best suited to the specific climatic conditions of each region, especially in dry areas where water competition between shade trees and cocoa plants can undermine the benefits of agroforestry (Agbenyo et al., 2022; Supriadi et al., 2022). International projects by development organizations like PUR and Solidaridad already promote cocoa agroforestry as a climate mitigation solution.

Cocoa agroforestry systems also offer substantial carbon storage potential, with cocoa biomass alone capable of storing around 30 tons of carbon per hectare. When integrated with shade trees, this carbon storage can increase significantly, reaching up to 136 tons per hectare. In some regions, such as Cameroon, older cocoa agroforestry systems can store as much as 196.9 tons of carbon per hectare. The roots of cocoa trees also contribute to carbon sequestration, with an average storage of around 7 tons of carbon per hectare. These variations in carbon storage are influenced by factors like tree density, plantation age, and the presence of shade trees. The inclusion of shade trees and the preservation of older cocoa trees in agroforestry systems not only enhance carbon sequestration but also make cocoa agroforestry a valuable strategy for mitigating climate change (Vervuurt et al., 2022).

Ethiopia has significant potential to leverage this carbon storage capability through cocoa agroforestry systems, particularly by integrating sustainable land management practices and aligning with global climate goals. By capitalizing on carbon finance mechanisms, Ethiopian farmers can receive financial incentives for adopting and maintaining these systems, which contribute to both climate resilience and diversified income sources. However, for Ethiopia to fully harness this opportunity, there is a need for capacity building in carbon measurement, reporting, and verification (MRV), as well as the establishment of strong market linkages.

Production of cocoa has been advised and implemented as a mechanism for sustainable biodiversity conservation in several cocoa-producing countries and plays valuable ecological roles in human-dominated landscapes and agro-ecosystems. Cocoa cultivation that maintains higher proportions of shade trees in a diverse structure (cocoa agroforestry) is progressively being viewed as a sustainable land-use practice that complements the conservation of biodiversity. However, it must be noted that cocoa agroforests do not equate with primary forests (WorldBank, 2022).

3.1. Livelihood diversification

In general, there are three determinants of household income for cocoa producers, which are cocoa producer price, cocoa yields, and other sources of income (diversification on or off the farm). The cocoa sector's strategy to boost farmers' income primarily revolves around increasing productivity. A second major approach is to diversify farm income, which is crucial for strengthening the resilience of farmers' earnings against potential risks like price collapses, crop diseases, and adverse weather conditions. While diversification is an important element of building this resilience, it is not a complete solution for significantly raising incomes on its own (van Vliet et al., 2021).

Cocoa agroforestry systems offer additional income opportunities for farmers, serving as an incentive for them to invest in and maintain these systems in cocoa-producing regions. By incorporating other crops e.g, fruit or timber trees, which are of economic importance, farmers can enhance their overall income potential.

A study conducted in Ghana demonstrated that farmers who diversified their activities into both farm and non-farm sectors achieved higher cocoa productivity (over fourteen bags) and a higher average income compared to those who did not diversify or only diversified into one area. The study concluded that farmers who diversified were generally better off, with non-farm diversification proving to be more lucrative than farm diversification alone (Owusu-Amankwah et al., 2017).

Various methods of diversification can be implemented to enhance farm and income security, such as processing cocoa farm produce (e.g., cocoa juice), improving production and yields of other crops, expanding into food production, livestock, and agroforestry, and participating in Payments for Environmental Services (PES), including carbon credits. These strategies collectively contribute to more stable and potentially increased income streams for cocoa farmers.

On-farm diversification in Ethiopia's cocoa sector offers multiple opportunities for farmers to enhance income and resilience. By adopting agroforestry systems, farmers can intercrop cocoa with shade trees, fruits, spices, and nuts, providing additional sources of revenue while improving soil health and biodiversity. Additionally, raising small livestock like poultry, goats, or bees on the farm can offer supplementary income through the sale of meat, eggs, honey, and manure, further enhancing the sustainability and profitability of cocoa farming.

4 Strategies for Cocoa Sector Development

The experiences in other countries, mainly in West Africa, indicate that there are two major cocoa production systems. These are (i) agroforestry-based cocoa production and (ii) full-sun cocoa production systems. Linked with the expansion of cocoa production with deforestation, land degradation, and loss of biodiversity, the recommended cocoa production approach is through an agroforestry approach considering the emerging experiences from West African countries mainly Ghana and Ivory Coast and elsewhere in the world. This is important in Ethiopia given the association of identified land suitability for cocoa with areas that have a forest cover (Figure 6) and the potential implications of the European Union Deforestation Directive (EUDR) that will become effective in the near future (EU, 2023).

In addition, global experiences related to success factors for the development of the cocoa industry that have relevance to the Ethiopian condition are identified to be (i) the provision of a well-tailored package of incentives to encourage investment, (ii) the promotion of effective and pro-active knowledge and skill transfer, (iii) promoting local ownership, and (iv) pool of management skilled in industrial processing especially in agro-processing (ACET, 2014).

The stated challenges and success factors demand the need for a strategic approach and sequencing of interventions to ensure the cocoa sector development in the country does not have a negative impact on the diverse aspects of the prevailing production systems (coffee) and also forest cover and biodiversity.

The key suggested strategic interventions are (i) capacitating and/or establishing a centre of excellence for cocoa production promotion, (ii) establishing demonstration sites in the most suitable target woredas, (iii) scaling of cocoa innovations, (iv) cocoa value chain development, (v) promotion of international investment for cocoa production and processing and (vi) enhancing the governance and enabling environment of the sector.

4.1 Capacitating research centres for the promotion of cocoa production

As a national agricultural research institute, EIAR through the Tepi Agricultural Research Centre has been leading the introduction, testing, validation, and release of improved cocoa technologies at the national level. Accordingly, it will be its mandate to ensure (i) the introduction, testing and release of improved varieties, i.e. resistant to swollen root virus, and technologies at national level by engaging all relevant members of the National Agricultural Research System (NARS), (ii) the development of required human capacity that can promote cocoa production in the target areas in a sustainable manner, and (iii) facilitate the demonstration and popularization of released technologies together with the suggested research excellence for cocoa promotion (Table 6) together with the federal MoA, Ethiopian Coffee and Tea Authority, the Agricultural Transformation Institute, the private sector and regional bureaus of agriculture.

Table 5 Suggested centres for cocoa promotion in Ethiopia

Suggested research centres	Institute	Region	Coverage (zones)
Tepi RC	EIAR	National	Coordination at the national level
		Oromia	Jimma, Buno Bedeno, Ilu Ababora
		SWER	Konta Special, Bench Sheko, Mirab Omo, Kefa, Sheka,Dawuro
Abobo RC	EIAR	Gambella	Majang, Agnewak
Pawi RC	EIAR	BG	Metekel, Kamashi, Assosa, Mao Komo Sp.
		Amhara	Awi, West Gojam
Haro Sebu RC	OARI	Oromia	Kelem Wellega, West Wellega, East Wellega
Jinka RC	SERARI	South Ethiopia	Basketo, Ari (South Omo), Gofa, Gedeo

As indicated in Table 6, five agricultural research centres, three from EIAR, one from OARI, and one from SERARI are suggested to be centres of excellence for cocoa promotion.

The key mandates for the suggested research centres are (i) closely working with Tepi RC to undertake introduction, testing and validation of available cocoa technologies in their respective target zones and woredas identified to be suitable, (ii) engage in capacity building for relevant actors engaged cocoa production, and (iii) promote cocoa production through pro-active demonstration and popularization of available technologies. The cocoa technologies cover improved cocoa varieties, pre-harvest, harvest and post-harvest technologies.

Given the fact that cocoa production and processing technologies and know-how are available globally, the priority role of these centres of excellence is to explore potential technologies, skills, and practices elsewhere in the world, introduce, test, and validate along with ensuring the design of sustainable scaling for wider impact.

4.2 Identification and demonstration in suitable locations

As a newly introduced crop, the scaling of cocoa production needs to first consider the demonstration of how it can be successfully produced and how it can contribute to the livelihood of local communities. Scaling of Cocoa production in Ethiopia can take lessons from the successful introduction of rice in many parts of Ethiopia (Alemu et al., 2018). Accordingly, cocoa production promotion in Ethiopia needs to be supported by (i) adequate awareness creation about available technologies and practices, (ii) access to the technologies for which demand was created, (iii) development and creation of linkage to cocoa processing facilities, (iv) market linkage for Cocoa beans through group action (cooperatives), and (v) existence of adequate support system by the public sector mainly extension services.

The Innovation Recommendation Mapping (IRM) (Farrow et al., 2025) at the woreda level can be used to narrow down the suitable locations for the introduction of cocoa. In line with the demonstration and popularization of cocoa technologies, there will be a need to consider suitable locations, where all issues from the seedling supply, and capacity-building activities, to fermentation and drying capacities at the producer and/or village level can be considered. It is suggested these locations will have (i) a nursery for a sustainable supply of cocoa seedlings potentially with seedlings generated through tissue culture, (ii) an adequate number of cocoa producers, and (iii) an aggregation facility. In this regard, the facilitation role of the suggested research centres is crucial. The initiation of market linkages for modern cocoa processors needs to be considered to create market incentives for producers and a sustainable supply of raw materials for processors.

Once there are well-established demonstration sites and experience in cocoa production, marketing, and processing, then there should be a scaling strategy. These strategies need to delineate the role of the public and private sectors in the scaling process. Experiences in other countries mainly in West Africa indicate that the cocoa production expansion is highly associated with private sector investment.

To create market linkages between Ethiopian cocoa producers and chocolate manufacturers, as well as stimulate domestic value addition, a multi-faceted approach is needed. This strategy should encompass both organizational strengthening and infrastructural development, ensuring that cocoa farmers can effectively connect with local processors, manufacturers, and exporters. In turn, downstream actors need to make investments, build their capacity, and develop products if Ethiopia aims to add value to its cocoa.

A key strategy to promote cocoa value chain development involves building strong relationships between producers and processors. Contract farming agreements can offer a structured collaboration model, where processors provide inputs, technical assistance, and feedback to farmers in exchange for a guaranteed supply of quality cocoa. However, due to the limited expertise and capacity of small domestic processors, other actors such as cooperatives, SMEs, NGOs, and government extension organizations (e.g., agricultural research centres, the Agricultural Transformation Institute) may need to fill this gap during the initial stages of value chain development.

Another viable model is the establishment of small- to medium-sized cocoa plantations that work with smallholder farmers as out-growers. These SMEs tend to have greater capacity to establish connections with processors and provide the necessary support to smallholders. Additionally, some Ethiopian processors are exploring vertical integration by setting up their own cocoa plantations. This approach offers multiple benefits, including supply chain control, quality assurance, and enhanced traceability.

Facilitating connections between new cocoa growers and domestic processors can be achieved through regular forums and networking events, allowing farmers and manufacturers to engage directly, discuss expectations, and collaboratively address challenges. Business support organizations can also play a vital role by actively organizing business-to-business matchmaking and fostering new partnerships between growers and processors.

4.3 Value Addition

Adding value to cocoa can be achieved through various methods, including improving cocoa quality by implementing good cultivation and fermentation practices, obtaining certifications, and establishing traceability systems that can fetch premium prices in international markets.

To capture more value locally, cocoa must be processed into semi-finished products or consumer items, such as chocolate bars. Achieving this requires investment in local processing infrastructure. Some Ethiopian chocolate makers have already made initial investments in bean-to-bar machinery, and further investment is under consideration. Supporting these investments may involve matchmaking with machinery suppliers, securing a reliable cocoa supply, and linking chocolate producers to finance.

The decision to process cocoa locally is influenced by additional factors, including competition between domestic processors and international cocoa buyers. As seen in the Ethiopian coffee sector, high-quality beans are often exported to fetch higher prices and access foreign currency. Therefore, international demand, the size of the local market, and the quality of chocolate produced for export are crucial factors.

A key strategy to promote local value addition and import substitution is to increase domestic consumption of Ethiopian cocoa and chocolate products. Campaigns promoting Ethiopian chocolate to consumers can create demand, incentivizing manufacturers to invest in local production. Retail partnerships with supermarkets, hotels, and restaurants can further enhance the visibility of Ethiopian chocolate brands, driving consumer awareness and demand.

Developing chocolate products for export is another viable strategy. Depending on the product type and quality, exports may target regional markets or focus on high-end markets in Europe and the United States. Export products will need to meet international standards for quality and certification. Capacity building in product development, certification, and marketing, along with fostering international partnerships, can help boost local processors. Advocacy for government policies supporting local cocoa production and processing, such as tax incentives for manufacturers using Ethiopian cocoa, could further enhance the sector.

To establish a successful chocolate sector in Ethiopia, the brand can take inspiration from Midunu Chocolates by emphasizing cultural storytelling and using indigenous ingredients, creating a unique identity in the luxury market. A strong focus on sustainability and ethical sourcing, similar to MIA, will resonate with conscious consumers while supporting local economic development through a locally driven supply chain. Building a strong artisanal identity and highlighting Ethiopian craftsmanship will position the brand as a premium offering. Leveraging Ethiopia's reputation for high-quality agriculture and offering distinct flavour profiles will help differentiate the product globally, making Ethiopian chocolate a unique and desirable choice in international markets.

Logistics also play a critical role in Ethiopia's ability to export chocolate, as temperature control is essential to prevent melting or deterioration of product quality. Ethiopia currently faces challenges in exporting refrigerated products via sea freight. However, projects such as the Cool Port Addis in Modjo, which is being developed to facilitate exports via the Djibouti port, are crucial improvements. Connecting manufacturers with these initiatives can help facilitate chocolate exports.

Ethiopian manufacturers are already producing a variety of cocoa-based products, including chocolate bars, spreads, and confectionaries. Developing new products for the local and international markets is vital for strengthening the domestic manufacturing industry. Domestic cocoa processors and artisanal chocolate makers can collaborate to produce high-end chocolates for the local market. While volumes may be low, this can help popularise chocolate among consumers. Integrating locally sourced ingredients and Ethiopian cultural elements into chocolate products can also create a unique selling proposition for Ethiopian chocolate. For example, incorporating indigenous spices, fruits, or nuts into chocolate products can offer a distinct flavour profile that appeals to both domestic consumers and international markets. Additionally, storytelling and branding that highlight Ethiopia's rich cultural heritage and commitment to sustainability can enhance the marketability of these products.

Innovative cocoa products

The development of innovative cocoa products plays a crucial role as part of the cocoa industry's development. For example, Swiss researchers have developed a method to make chocolate healthier and more sustainable by utilizing the entire cocoa fruit, rather than just the beans and pulp traditionally used. By incorporating the endocarp, the inner layer of the cocoa pod, into the chocolate-making process, they created a sweet cocoa jelly that can replace granulated sugar. This innovation allows farmers to generate income from three parts of the cocoa fruit: beans, pulp, and the endocarp, making cocoa production more economically viable and environmentally friendly. The new chocolate formulation, which reduces the need for cocoa beans and land use, could significantly lower the environmental impact of chocolate production. While large-scale implementation requires infrastructure changes, such as drying facilities for farmers, the potential benefits are substantial.

Cocoa honey, a by-product of the cocoa fermentation process, is a translucent juice with sweet, honey-like sensory characteristics, derived from the enzymatic liquefaction of cocoa pulp. Traditionally produced during the initial stages of cocoa bean processing, this juice, also known as "miel de cacao," offers a potential new avenue for sustainability in the cocoa industry. Despite its chemical and sensory similarity to the original pulp, cocoa honey remains underutilized. As the global demand for cocoa continues to rise, innovative uses of cocoa residues, including cocoa honey, are critical to enhancing production and sustainability in the cocoa supply chain, particularly in producing countries like Ethiopia, where similar agricultural innovations could be explored (Guirlanda et al., 2021).

4.4 Governance and enabling environment

As indicated above, the key success factors for the cocoa industry development i.e. from production to processing are related to the availability of a well-tailored package of incentives to encourage investment, a system for the promotion of effective and pro-active knowledge and skill transfer, and local ownership, and availability of a pool of management skilled in agro-processing. This demands the presence of an effective governance structure for the sector promotion that can create a supportive enabling environment in a sustainable manner.

Under Ethiopian conditions, the key opportunities as an enabling environment are related to (i) the 2023 proclamation on agricultural contract farming that can enhance market linkages between possible cocoa producers and processors, (ii) investment incentives for both domestic and foreign investors including fiscal incentives related to duty-free import of capital goods, tax holidays for priority sectors, income tax holidays (1-9 years), provision of land with competitive lease prices, investment credit support and existence of readily available agro-industrial parks. In order to better exploit these opportunities, there is a need to have a focused governance structure that can facilitate the promotion of production, marketing, and processing.

Given the early stage of the cocoa sector in the country, the overall leadership in promoting cocoa is suggested to be through EIAR in collaboration with the relevant members of the National Agricultural Research System, the private sector, the MoA together with regional bureaus of agriculture as well as with Some West African countries with developed cocoa sector.

Given the early stage of the cocoa sector in the country, the overall leadership in promoting cocoa is suggested to be through EIAR in collaboration with the relevant members of the National Agricultural Research System, the private sector, the MoA together with regional bureaus of agriculture. Key to steering the sector's development in right direction is collaboration with international cocoa businesses and INGOs, which can help with adopting industry best practices and ensure development of a sustainable value chain. Moreover, there is an opportunity for pan-African collaboration with other cocoa-producing countries (for example in West Africa) to support with industry knowledge and technology. One such topic is on the introduction and development of new cocoa varieties. Ethiopian stakeholders can collaborate with established cocoa growing countries to import other varieties (i.e., Criollo, Trinitario, crossbreeds) and draw on the technical know-how of these countries' research institutes and businesses to support with selecting the right varieties, conducting trials, seedling multiplication, and best cultivation practices.

5 Conclusion and the Way Forward for Cocoa Sector Development

Considering the production and marketing potential, Ethiopia has a unique opportunity to leapfrog into a sustainable cocoa sector by building from the ground up, given that cocoa cultivation is currently non-existent in the country. This clean state offers the opportunity to establish a cocoa industry that avoids the entrenched issues seen in West Africa, such as poverty, inadequate living conditions, child labour, deforestation, biodiversity loss, and the impacts of climate change. By proactively addressing these challenges, Ethiopia can create a sustainable and ethical cocoa industry from the outset.

One of the key strategies for this approach is to apply sustainable practices in cocoa cultivation. Ethiopia can draw on its rich tradition of garden coffee and agroforestry coffee systems, which are already well-established in the country. By integrating cocoa into these agroforestry systems, Ethiopia can promote biodiversity, enhance soil health, and ensure that cocoa cultivation does not lead to deforestation. This approach also aligns with the global push towards sustainable agriculture, which prioritizes environmental conservation and the well-being of farming communities.

Additionally, Ethiopia has the opportunity to ensure that its cocoa sector complies with emerging international standards, such as the European Union's stringent legislation on sustainable sourcing. By adhering to these regulations, Ethiopia can position itself as a leader in the global cocoa market, attracting buyers who prioritize ethical and sustainable practices. Furthermore, building robust infrastructure and ensuring access to finance for farmers will be crucial in supporting the development of a thriving, sustainable cocoa industry. By starting from scratch with a strong foundation, Ethiopia can create a cocoa sector that not only contributes to economic growth but also sets a benchmark for sustainability in the global market.

In order to fully exploit the potential along with the presented experiences in other countries, Ethiopia needs to follow a strategic approach and sequenced interventions to ensure the cocoa sector development in the country does not have a negative impact on the diverse aspects of the prevailing production systems as well as forest cover and biodiversity. These strategic interventions are (i) capacitating and/or establishing centre of excellence for cocoa production promotion, (ii) establishing cocoa demonstration sites in the most suitable target woredas, (iii) scaling of cocoa innovations, (iv) cocoa value chain development, (v) promotion of international investment for cocoa production and processing and (vi) enhancing the governance and enabling environment of the sector.

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Annex

Annex 1: Proportion of land under highly suitable (S1) classes for Cocoa production by Region and Zone: lists of potential *woredas*

Regions	Area and % of S1 by region		Potential Zones			Potential woredas (listed in a decreasing order area of S1)
	Area (ha)	%	Zone	%*	%**	
Benishangul-Gumuz	1,545,396	30.67	Metekel	37.22	18.87	Wembera, Dangur, Guba, Bulen, Dibate, Mandura, Pawe
			Kamashi	35.90	7.21	Zayi, Sedal, Dembe, Kamashi, Mizyiga
			Assosa	16.98	3.89	Sherkole, Bilidigilu, Menge, Assosa, Undulu, Kurmuk, Homosha
			Mao Komo Sp.	11.11	0.71	Maokomo Special
South-West Ethiopia Peoples	1,404,916	35.91	Konta Special	60.68	3.65	Konta
			Bench Sheko	58.96	6.98	Gurafereda, Debub Bench, Sheko, Shay Bench, Semen Bench, Gidi Bench
			Mirab Omo	46.93	17.83	Surma, Maji, Gori Gesha, Menit Shasha, Menit Goldiye, Bero, Gachit,
			Kefa	19.92	5.37	Goba (SP), Cheta, Decha, Gewata, Chena, Gimbo, Shisho Ande, Bita, Adiyio, Tullo
			Sheka	16.92	1.02	Masha, Yeki, Anderacha, Tepi
			Dawuro	9.47	1.06	Isara, Kachi, Disa, Tocha, Gena, Tercha Zuriya, Loma
Gambela	1,167,544	37.15	Majang	84.14	6.25	Mengesh, Godere
			Agnewak	43.87	30.88	Dima (GM), Gambela Zuria, Abobo, Gog
Oromia	259,996	0.80	Kelem Wellega	9.37	0.28	Gidami, Anfilo, Dale Sadi, Sayo, Lalo Kile, Dale Wabera, Gawo Kebe, Hawa Galan, Sedi Chenk
			Ilu Aba Bora	5.33	0.17	Sale Nono, Darimu, Ale, Bure (OR), Metu Zuria, Didu, Halu /Huka, Becho (Ilu Aba Bora), Bilo Nopha
			West Wellega	3.66	0.14	Mana Sibu, Guliso, Babo, Ayira, Kiltu Kara, Boji Chekorsa, Jarso (West Wellega), Sayo Nole, Leta Sibu,
			East Wellega	2.58	0.11	Haro Limu, Guto Gida, Sasiga, Gida Ayana, Kiremu, Ibantu, Limu
			Jimma	1.41	0.08	Shebe Sambo, Seka Chekorsa, Dedo, Gera, Mancho
			Buno Bedele	1.16	0.02	Bedele Zuria, Gechi, Chwaka, Meko
South Ethiopia	197,100	3.11	Basketo	9.82	0.06	Basketo SP Woreda
			Ari (South Omo)	7.07	2.59	Salamago, South Ari, Malie, North Ari, Wub Ari, Bena Tsemay
			Gofa	5.62	0.40	Melekoza, Melo Gada
			Gedeo	0.95	0.02	Wenago, Dila Zuria
Amhara	42,344	0.27	Awi	3.47	0.20	Guangua, Jawi
			West Gojam	0.60	0.05	Wemberma, Debub Achefer

** Percentage contribution relative to the zone*
*** Percentage contribution relative to the Region*

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