BUSINESS OPPORTUNITIES IN AGRO-PROCESSING INDUSTRY PRODUCT PACKAGING

.

A project co-funded by the European Union

BIC ETHIOPIA
AFRICAN BUSINESS INCUBATOR COMMUNITIES

Study developed by:

አዲስ ቻምበር
ADDIS CHAMBER

Acknowledgement

This study was carried out by Ekuma Consultancy And Training Service PLC, who was commissioned by Addis Ababa Chamber of Commerce and Sectoral Associations to undertake the research and analysis in full. We extend our appreciation for their expertise and the comprehensive work delivered throughout the study process.

Content index

Abbreviations

The following abbreviations are used in the report:

AACCSA	Addis Ababa Chamber of Commerce and Sectoral Associations
BDS	Business Development Service
EU	European Union
GDP	Gross Domestic Product
GoE	Government of Ethiopia
HGER	Homegrown Economic Reform
ICT	Information Communication Technology
IDSP	Industrial Development Strategic Plan
KII	Key Informant Interview
MSE	Micro and Small Enterprise
MFI	Micro Finance Institutions
NBE	National Bank of Ethiopia
NGO	Non-Governmental Organization
PLC	Private Limited Company
RRR	Requirement Reserve Ratio
SACCO	Saving and Credit Cooperative
SME	Small and Medium Enterprise
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan Africa
ToR	Terms of Reference
USD	United States Dollar

List of Tables

List of Figures

List of Boxes

BIC ETHIOPIA
AFRICAN BUSINESS INCUBATOR COMMUNITIES

01: Project background and introduction

BIC Ethiopia targets strengthening the incubation ecosystem for entrepreneurs and micro, small and medium-sized enterprises (MSMEs) active in agri-tech and agri-business in Ethiopia. Key challenges addressed are sustainability of business models for incubators, quality of business support services, availability of services outside Addis Ababa, access to finance for MSMEs and strengthening the relevant regulative framework supporting start-ups. There is a specific focus to expand services beyond Addis Ababa to also cover secondary cities and rural Ethiopia to support geographically inclusive growth.

The project aims to address these bottlenecks in the Ethiopian startup ecosystem by working with fifteen (15) selected existing and newly established incubators and by supporting them in developing sustainable and technically sound business models. The incubators are thus enabled to better support start-ups and MSMEs in agricultural technology and agribusiness to improve market access, generate higher incomes and create jobs.

The action is implemented by a consortium of five organisations, led by sequa gGmbH, a German non-profit specialist in private sector development in low-income markets, active internationally since 1991 and in Ethiopia since 2002. The Addis Chamber of Commerce and Sectoral Associations capitalises on its reach-out to 50,000 SME members and its experience to shape national policies in favour of the private sector. adelphi gGmBH and GrowthAfrica Foundation contribute their vast experience in curriculum development towards start-ups, entrepreneurs, the capacity building of incubation hubs and acceleration programmes, and access to finance strategies. icehawassa, a national grassroots innovation centre, and the Ethiopia-focused foundation Menschen für Menschen (MfM) establish, expand, and manage incubation centres in the southern and northern regions.

BIC Ethiopia also works with the Ethiopian Association of Startup Ecosystem (EASE) and the regional network BIC Africa. The former is currently being established by private, academic, and non-profit incubators to serve as a network and discussion forum for incubation centres in Ethiopia, while the latter is a regional network supporting business incubators in Africa to excel and spark a wide impact in society.

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the BIC Ethiopia consortium and do not necessarily reflect the views of the European Union.

02: Executive Summary

Ethiopia has a diverse agricultural sector crucial to the nation's economy, contributing significantly to employment, income generation, and food security. The agro-processing industry has exhibited consistent growth, largely driven by increased agricultural productivity and governmental initiatives aimed at promoting value addition and industrialization (FAO 2020). Against this backdrop, this study explores potential business opportunities in product packaging within the agro-processing sector, with a particular focus on enabling young innovators to establish their own ventures. The study's objectives are to analyze the agro-processing industry, underscore the critical role of packaging in enhancing product value, examine existing challenges, and identify avenues for entrepreneurial engagement. Furthermore, the study aims to evaluate the demand and viability of innovative packaging solutions, while providing practical guidelines to support young entrepreneurs in developing startups within the agro-processing packaging industry.

To meet the study's objectives, a mix of primary and secondary sources was utilized to gather adequate and reliable data and information. The primary sources of data and information were agro processing firms, packaging industries, government offices including Ethiopian Statistical Services (ESS), Ethiopian Investment Commission (EIC), Plan and Development Commission (PDC); Ministry of Trade and Regional Integration (MoTRI), Ministry of Industry (MoI), Ministry of Agriculture (MoA), and others. Key informant interviews (KIIs) were conducted with key individuals and organizations, engaged stakeholders, designed questionnaires, analyzed data, consulted with the client, and prepared the study report. Secondary information on agro-processing industries and packaging solutions existing in the form of texts, audio, or video recordings, sourced from both published and unpublished documents and reports , were also collected and assessed. The study employed desk/literature reviews and interviews. In this regard, the Consultant reviewed literature on agro-processing and packaging solutions, including government policies, legal frameworks, research studies, and agricultural performance. This review explored initiatives to modernize the packaging sector, international practices from various countries, and covered concepts, types, functions, and criteria for packaging in agro-processing industries.

Key lessons from the literature review highlight that different countries provide valuable insights for Ethiopia's emerging agro-processing packaging industry. Kenya emphasizes resource-based, sustainable packaging through supportive regulations and capacity-building initiatives to enhance agro-product packaging skills and knowledge (Arvanitoyannis, I. S., & Bosnea 2004). India is noted for cost-effective, flexible packaging solutions like laminated pouches, suitable for small-scale producers commonly used for packaging spices, tea, and snacks (Chikweche, T., &

2020/21 (NBE 2024). Nevertheless, Ethiopia remains the fourth-largest economy in Sub-Saharan Africa, with its GDP increasing from USD 107.6 billion in 2019/20 to USD 163.69 billion in 2020/21 (PDC 2020; NBE 2024).

Agriculture was historically the leading contributor to Ethiopia's GDP until the service sector took the lead in 2010. In 2022/23, the service sector held the largest share at 40.3% of GDP, followed by agriculture at 32.1% and industry at 28.8% (NBE 2024). Data from NBE shows that agriculture dominated in 2003/04 with 51.6% of GDP, compared to 37% from services and 10.9% from industry. However, by 2010/11, the service sector overtook agriculture, contributing 45.23% to GDP while agriculture's share declined to 44.37% (NBE 2024). Ethiopia's agriculture is primarily driven by smallholder farms, which contribute over 90% of total output and cropland use, alongside crop production, pastoralism, and commercial farming (NBE 2024). Agriculture accounts for nearly 82%

of exports, with crops comprising 76.5% and livestock 3.5%. The sector employs approximately 75% of the workforce, though 95% of farming is rain-fed and characterized by low-input, subsistence practices (CCA 2022). Despite these challenges, Ethiopia's diverse agro-ecological conditions support extensive agricultural potential, offering opportunities in irrigation, crop and livestock development, and cultivation of a wide variety of crops, including cereals, pulses, coffee, and chat.

Ethiopia's agro-processing sector has seen notable achievements, especially in food-related products like coffee, bakery items, and grain processing, but there are significant gaps. Data on the number and distribution of agro-processing businesses vary across sources (about 3,361 by EIC; about 1,712 large & medium scale and 41,975 small scale by CSA; and about 26,000 by MoTRI). The sector is concentrated in Addis Ababa and Oromia, with untapped growth potential in less developed regions and other industries like textiles and leather. Similar discrepancies exist in packaging industry data, with EIC citing 95 operational businesses, Manufactuing Africa (2022) listing 59, and MoTRI noting 669 licensed establishments. Despite differences, all sources agree on a concentration in Addis Ababa, predominantly in paper packaging (75%). The sector has strong growth potential, contingent on increased investment, sustainability efforts, and enhanced capacity-building initiatives.

Ethiopia's packaging industry has substantial growth potential, particularly for local manufacturers to expand their market share. Manufactuing Africa (2022) reports that Ethiopia's packaging consumption reached USD 648 million, with an annual growth of 8%. Of this, USD 438 million (68%) could be supplied by local manufacturers, excluding pre-packaged imports. The agro-processing sector is the largest consumer, with the food and beverage industry accounting for 58% of sales (food 32%, drinks 26%), and plastics making up 56% of packaging materials used. However, Ethiopia currently meets only 41% of its packaging needs through local production, compared to 60% in the average African economy, highlighting a gap local manufacturers could fill. There are significant investment opportunities across the value chain, particularly in raw materials like pulp, paperboard, liquid cartons, and plastics.

Ethiopia's packaging sector faces multiple challenges, including low competitiveness, small-scale operations, costly raw material imports, and stringent regulations, leading to a low ease of doing business. Packaging companies, especially those serving agro-processing, contend with high costs from logistics and intermediaries, low-quality products due to outdated technology, limited customization, and poor after-sales service. The sector also struggles with complex startup procedures, unreliable electricity, and bureaucratic inefficiencies that hinder converting licensed investments into fully operational businesses.

The value chain for packaging agro-processed products in Ethiopia is vital to the agricultural and industrial sectors, involving multiple stages and actors. This study identifies seven key stages: agricultural production, collection and aggregation, primary processing, secondary processing and packaging, distribution, sustainability and innovations, and growth opportunities. Each stage—from cultivating raw materials to distributing finished goods—plays a crucial role in efficiency, compliance, and sustainability, with a focus on eco-friendly practices and identifying areas for sector improvement.

The Ethiopian packaging industry for agro-processing involves a diverse range of stakeholders. These include government bodies (MoTRI, MoI, MoA, ATA, IES, MoIT, EIC), private companies (Chamber of Commerce, agro-processing industries, retailers, wholesalers, exporters, packaging startups), academic and research institutions, NGOs, international organizations, and associations.

Other key actors are financial institutions, logistics companies, storage providers, farmers, end consumers, recycling companies, waste management entities, and local/regional governments. This report further details the roles and contributions of these stakeholders, focusing on developing the packaging value chain for agro-processed products.

The study explores various factors that impact the feasibility of packaging innovations for young Ethiopian entrepreneurs. It advises that young innovators consider key elements such as material availability, financial factors (costs and revenue), market demand, technological feasibility, logistical challenges, regulatory requirements, and environmental concerns when developing scalable solutions for both domestic and international markets. Feasibility studies should thoroughly address market analysis, technical, financial, economic, and operational viability, as well as legal, regulatory, environmental, and social considerations. Besides, the report offers practical guidance for young entrepreneurs in agro-processing packaging. To succeed in Ethiopia's agro-processing industry, young innovators must leverage local resources, adopt sustainable practices, and remain adaptable to market demands. Entrepreneurs can position themselves for success both domestically and internationally, especially by understanding market dynamics, utilizing government incentives, and forming strategic partnerships.

To improve Ethiopia's agro-processing sector, the study recommends enhancing the packaging industry by addressing key challenges. Suggested interventions include improving the ease of doing business, boosting local competitiveness, diversifying packaging solutions to include sustainable alternatives, and adopting global best practices in sustainability, technology, and safety. The study also advocates decentralizing packaging industries, promoting domestic raw material production, providing policy support and incentives, enforcing timely regulations, and raising public awareness of the benefits of innovative, sustainable packaging. These steps aim to drive growth, improve product quality, and strengthen Ethiopia's global market position.

Fletcher 2012). Germany stands out for its use of biodegradable materials and smart packaging technologies such as RFID tags and QR codes (Keller, K. L., & Swaminathan 2019; Pagotto, M., & Fabbricino 2018). The U.S. leads in innovation, convenience, and sustainability in agro-processed goods packaging (Bakalis, S., Valdramidis, V. P., Argyropoulos, D., Ahrne, L., Cullen, P. J., Gertsis, A. C., & Van Impe 2015). These international practices offer diverse strategies that Ethiopia can adapt to strengthen its nascent agro-processing packaging sector.

Ethiopia has recently experienced rapid economic growth, leading Sub-Saharan Africa with an average annual GDP growth of 8.9% between 2015/16 and 2022/23 (NBE 2024). Despite a notable average growth of 10.1% from 2010/11 to 2014/15, it slowed to 7.8% from 2015/16 to 2022/23, and further decelerated to an average of 6.5% over the last three years, including 6.3% in 2020/21 (NBE 2024). Nevertheless, Ethiopia remains the fourth-largest economy in Sub-Saharan Africa, with its GDP increasing from USD 107.6 billion in 2019/20 to USD 163.69 billion in 2020/21 (PDC 2020; NBE 2024).

Agriculture was historically the leading contributor to Ethiopia's GDP until the service sector took the lead in 2010. In 2022/23, the service sector held the largest share at 40.3% of GDP, followed by agriculture at 32.1% and industry at 28.8% (NBE 2024). Data from NBE shows that agriculture dominated in 2003/04 with 51.6% of GDP, compared to 37% from services and 10.9% from industry. However, by 2010/11, the service sector overtook agriculture, contributing 45.23% to GDP while agriculture's share declined to 44.37% (NBE 2024). Ethiopia's agriculture is primarily driven

by smallholder farms, which contribute over 90% of total output and cropland use, alongside crop production, pastoralism, and commercial farming (NBE 2024). Agriculture accounts for nearly 82% of exports, with crops comprising 76.5% and livestock 3.5%. The sector employs approximately 75% of the workforce, though 95% of farming is rain-fed and characterized by low-input, subsistence practices (CCA 2022). Despite these challenges, Ethiopia's diverse agro-ecological conditions support extensive agricultural potential, offering opportunities in irrigation, crop and livestock development, and cultivation of a wide variety of crops, including cereals, pulses, coffee, and chat.

Ethiopia's agro-processing sector has seen notable achievements, especially in food-related products like coffee, bakery items, and grain processing, but there are significant gaps. Data on the number and distribution of agro-processing businesses vary across sources (about 3,361 by EIC; about 1,712 large & medium scale and 41,975 small scale by CSA; and about 26,000 by MoTRI). The sector is concentrated in Addis Ababa and Oromia, with untapped growth potential in less developed regions and other industries like textiles and leather. Similar discrepancies exist in packaging industry data, with EIC citing 95 operational businesses, Manufactuing Africa (2022) listing 59, and MoTRI noting 669 licensed establishments. Despite differences, all sources agree on a concentration in Addis Ababa, predominantly in paper packaging (75%). The sector has strong growth potential, contingent on increased investment, sustainability efforts, and enhanced capacity-building initiatives.

Ethiopia's packaging industry has substantial growth potential, particularly for local manufacturers to expand their market share. Manufactuing Africa (2022) reports that Ethiopia's packaging consumption reached USD 648 million, with an annual growth of 8%. Of this, USD 438 million (68%) could be supplied by local manufacturers, excluding pre-packaged imports. The agro-processing sector is the largest consumer, with the food and beverage industry accounting for 58% of sales (food 32%, drinks 26%), and plastics making up 56% of packaging materials used. However, Ethiopia currently meets only 41% of its packaging needs through local production, compared to 60% in the average African economy, highlighting a gap local manufacturers could fill. There are significant investment opportunities across the value chain, particularly in raw materials like pulp, paperboard, liquid cartons, and plastics.

Ethiopia's packaging sector faces multiple challenges, including low competitiveness, small-scale operations, costly raw material imports, and stringent regulations, leading to a low ease of doing business. Packaging companies, especially those serving agro-processing, contend with high costs from logistics and intermediaries, low-quality products due to outdated technology, limited customization, and poor after-sales service. The sector also struggles with complex startup procedures, unreliable electricity, and bureaucratic inefficiencies that hinder converting licensed investments into fully operational businesses.

The value chain for packaging agro-processed products in Ethiopia is vital to the agricultural and industrial sectors, involving multiple stages and actors. This study identifies seven key stages: agricultural production, collection and aggregation, primary processing, secondary processing and packaging, distribution, sustainability and innovations, and growth opportunities. Each stage—from cultivating raw materials to distributing finished goods—plays a crucial role in efficiency, compliance, and sustainability, with a focus on eco-friendly practices and identifying areas for sector improvement.

The Ethiopian packaging industry for agro-processing involves a diverse range of stakeholders. These include government bodies (MoTRI, MoI, MoA, ATA, IES, MoIT, EIC), private companies

(Chamber of Commerce, agro-processing industries, retailers, wholesalers, exporters, packaging startups), academic and research institutions, NGOs, international organizations, and associations. Other key actors are financial institutions, logistics companies, storage providers, farmers, end consumers, recycling companies, waste management entities, and local/regional governments. This report further details the roles and contributions of these stakeholders, focusing on developing the packaging value chain for agro-processed products.

The study explores various factors that impact the feasibility of packaging innovations for young Ethiopian entrepreneurs. It advises that young innovators consider key elements such as material availability, financial factors (costs and revenue), market demand, technological feasibility, logistical challenges, regulatory requirements, and environmental concerns when developing scalable solutions for both domestic and international markets. Feasibility studies should thoroughly address market analysis, technical, financial, economic, and operational viability, as well as legal, regulatory, environmental, and social considerations. Besides, the report offers practical guidance for young entrepreneurs in agro-processing packaging. To succeed in Ethiopia's agro-processing industry, young innovators must leverage local resources, adopt sustainable practices, and remain adaptable to market demands. Entrepreneurs can position themselves for success both domestically and internationally, especially by understanding market dynamics, utilizing government incentives, and forming strategic partnerships.

To improve Ethiopia's agro-processing sector, the study recommends enhancing the packaging industry by addressing key challenges. Suggested interventions include improving the ease of doing business, boosting local competitiveness, diversifying packaging solutions to include sustainable alternatives, and adopting global best practices in sustainability, technology, and safety. The study also advocates decentralizing packaging industries, promoting domestic raw material production, providing policy support and incentives, enforcing timely regulations, and raising public awareness of the benefits of innovative, sustainable packaging. These steps aim to drive growth, improve product quality, and strengthen Ethiopia's global market position.

Chapter 01 – Introduction

01.1: Background and the Rationales of the Study

The Addis Ababa Chamber of Commerce and Sectoral Associations (AACCSA) was re-established as a voluntary business membership organization under Proclamation Number 341/2003. AACCSA is committed to promoting business and investment by providing tailored services to its members and actively advocating for favorable business conditions. With a vision to act as a catalyst for the growth of dynamic and successful enterprises in Ethiopia, AACCSA aims to make a significant contribution to the nation's economic prosperity.

Within its prescribed scope, AACCSA actively undertakes the facilitation of trade and investment, dissemination of pertinent business intelligence, consultation with its members and government entities regarding varied economic and business matters, provision of business-oriented training sessions, cultivation of partnerships with other chambers of commerce, and engagement in research initiatives pertaining to business and economic domains to adequately articulate the interests and perspectives of the private sector. Furthermore, the Chamber has established a notable track record in delivering arbitration services to businesses and oversees the operations of the Institute of Directors - Ethiopia (IOD-E) with the aim of enhancing corporate governance standards and professionalizing directors and boards across Ethiopia. Moreover, in collaboration with allied partners, AACCSA executes Environmental, Social, and Governance (ESG) initiatives. As a member of the World Chambers Federation, AACCSA maintains a prominent position within the global network of chambers.

In accordance with its objectives and to accommodate supplementary responsibilities, AACCSA has recently undergone significant restructuring, leading to the establishment of additional units. Notably, one such unit is the Business Innovation Center (BIC), designed to aid entrepreneurs in advancing their enterprises and mitigating associated obstacles through the provision of diverse business and technical support services, encompassing training, advisory assistance, networking opportunities, and linkages facilitation. In order to facilitate the establishment and operationalization of this center, AACCSA has engaged in a collaborative agreement with SEQUA. Under the terms of this cooperative accord, AACCSA's BIC has been entrusted with the execution of studies concerning value chain opportunities.

This study aims to find business opportunities in product packaging for the agro-processing industry that can help young innovators start their own businesses. Ethiopia has a diverse agricultural sector that plays a crucial role in its economy, contributing significantly to employment, income generation, and food security. The country's agro-processing industry has been steadily growing, driven by increasing agricultural productivity and government initiatives to promote value addition and industrialization (FAO 2020).

However, the packaging of agro-processed products in Ethiopia faces several challenges. One of the primary challenges is the lack of modern packaging facilities and infrastructure, leading to inefficiencies in product handling and storage (IFC 2018). There is a limited availability of high-quality packaging materials, resulting in inadequate protection of products from spoilage,

contamination, and damage during transportation and storage (Abegaz, T., Kebret, M., Arega 2017). The absence of standardized packaging practices and quality control measures hinders the competitiveness of Ethiopian agro-processed products in both domestic and international markets (Mengistu, A., Belachew, A., Mergia 2019). This lack of standardization also poses challenges in meeting regulatory requirements and consumer preferences for packaged goods (UNECA 2016). Despite these challenges, there are opportunities for innovation and improvement in agro-processing industry product packaging in Ethiopia. With growing demand for packaged food products driven by urbanization, changing lifestyles, and increasing disposable incomes, there is a need for investment in modern packaging technologies and practices (EIC 2020). On top of that, Ethiopia's diverse agricultural resources offer opportunities for creating value-added products for both domestic and international markets. Ethiopian agro-processors can improve the competitiveness and appeal of their products in the market by utilizing sustainable packaging solutions and implementing best practices in design and labeling (UNIDO 2019).

Although Ethiopia's agro-processing industry shows considerable growth potential, the challenges within its packaging sector threaten its long-term success. By promoting the development of local production capabilities for advanced packaging solutions, prioritizing investments in recycling initiatives, and incorporating sustainability considerations, Ethiopia can address this important obstacle. The future of the agro-processing industry depends on resolving packaging issues, presenting an opportunity for innovation and sustainable growth.

Recent trend shows a notable increase in demand for agro-processing packaging both globally and locally. In response, this study tried to explore potential business opportunities in product packaging for the agro-processing industry and evaluate the feasibility of manufacturing packaging solutions for agro-processed goods. The study's objective is to provide relevant findings, innovative ideas, and actionable recommendations to guide and inform aspiring entrepreneurs in this industry. The report offers valuable insights that can promote the development of new practices within the sector.

Exploring business opportunities in agro-processing industry product packaging and investigating the feasibility of manufacturing packaging for agro processed products is motivated by the growing market demand, potential for value addition, need for food safety assurance, supply chain efficiency optimization, sustainability considerations, export potential, entrepreneurial opportunities, government support, and long-term growth prospects in the sector. Ethiopia's agricultural sector is a primary source of livelihood for a large portion of the population, yet much of its potential remains untapped due to limitations in value addition and market access. Effective packaging plays a crucial role in enhancing product marketability, shelf-life extension, and overall competitiveness in both domestic and international markets. That being minded, this study presents business opportunities in the agro-processing industry's product packaging sector, with the goal of identifying strategies to maximize value addition, enhance market access, and stimulate economic growth in Ethiopia.

This report, titled "Business Opportunities in Agro-Processing Industry Product Packaging" has been prepared by EKUMA Consultancy and Training Service PLC, following AACCSA's commissioning to the firm with a competitive bid to conduct the study. The key objective of the study is to investigate and pinpoint potential business prospects in the agro-processing industry's product packaging segment, particularly targeting young innovators, and to bring crucial business

insights tailored for ventures in Ethiopia. Through an exhaustive examination, the report presents its findings, practical recommendations, and implementable strategies. These outcomes are anticipated to offer significant contributions, aiding policymakers, manufacturers, development agencies, and aspiring entrepreneurs seeking to venture into the realm of agro-processing industry product packaging in the country.

01.2: Overview of the task

The consultants at Ekuma Consultancy and Training Service Plc have thoroughly grasped the significance and nuances of the assignment commissioned by the AACCSA. Our understanding encompasses the following key points:

i. Contextual Awareness

We recognize the evolving economic landscape in Ethiopia and the pivotal role of AACCSA in facilitating business growth and investment. Understanding AACCSA's recent restructuring efforts, including the establishment of the Business Innovation Center (BIC), underscores the Chamber's commitment to supporting entrepreneurial endeavors and fostering innovation.

ii. Importance of the packaging industry

Agricultural product packaging is vital in the agro-processing industry by maintaining product quality, preventing damage, improving market visibility, communicating essential information, ensuring regulatory compliance, and adding value to agricultural products. Well-designed packaging strategies are key to the success, competitiveness, and long-term sustainability of agro-processing businesses in today's evolving market.

iii. Objective Alignment

We are aligned with the overarching objectives of the study, which include

- Providing an overview of the agro-processing sector and its outputs, emphasizing the role of packaging in adding value to the products.
- Assessing the current state of agro-processing industry product packaging and identify challenges therein.
- Identifying and analyzing business opportunities within the packaging industry, with a strategic focus on creating pathways for young entrepreneurs.
- Assessing the demand for innovative packaging solutions in the industry.

- Assessing the feasibility of packaging innovations and come-up with a guide for young innovators in establishing business within agro-processing industry product packaging.
- Developing practical recommendations and guidelines to assist young entrepreneurs in establishing startups within the agro-processing packaging sector.

iv. Scope Clarification

The study focuses on the agro-processing sector in Ethiopia, with particular emphasis on product packaging. It encompasses various stages of the value chain, including packaging materials, design, manufacturing, and distribution. The scope covers a range of agricultural products such as grains, fruits, vegetables, spices, and processed foods. The study also considers both domestic and export markets, as well as regulatory frameworks and industry trends influencing packaging practices in Ethiopia.

v. Collaborative Approach

By employing a multi-method approach, this study aims to provide a comprehensive understanding of the business opportunities in the agro-processing industry related to product packaging in Ethiopia, laying the groundwork for informed decision-making and policy formulation in this critical sector.

In conclusion, Ekuma Consultancy and Training Service PLC is well-prepared and committed to carrying out the assignment with accuracy, professionalism, and dedication. Our consultants are ready to provide practical insights and recommendations that will support the growth of the agro-processing packaging sector. AACCSA plans to leverage the study's findings to support policy advocacy efforts, empowering the Chamber to advance its mission of creating a more favorable business environment. The consultant has demonstrated a strong understanding of AACCSA's goals and the expected outcomes of the study.

01.3: Overview of the task

The general objective of the study is to explore and identify business opportunities in agro-processing industry product packaging for young innovators and provide valuable business information for business ventures. With this overriding objective, the study has the following specific objectives.

- Provide an overview of the agro-processing sector and its outputs, emphasizing the role of packaging in adding value to the products.
- Assess the current state of agro-processing industry product packaging and identify challenges therein.

- Identify and analyze business opportunities within the packaging industry, with a strategic focus on creating pathways for young entrepreneurs.
- Assess the demand for innovative packaging solutions in the industry.
- Assess the feasibility of packaging innovations and come-up with a guide for young innovators in establishing business within agro-processing industry product packaging.
- Develop practical recommendations and guidelines to assist young entrepreneurs in establishing startups within the agro-processing packaging sector.

01.4: Overview of the task

The following scope of work delineates the primary objectives and tasks involved in conducting an extensive study on fostering the development of product packaging within the agro-processing industry, particularly targeting young innovators in Ethiopia. Divided into four distinct areas—Value Chain Analysis, Market Trends, Entrepreneurial Opportunities, and Guidelines for Startup Empowerment—the scope entails a comprehensive exploration of the agro-processing industry's packaging landscape. From mapping the value chain and identifying stakeholders to analyzing market trends and offering actionable recommendations, this scope of work seeks to facilitate informed decision-making and empower young entrepreneurs within the agro-processing industry packaging sector.

a. Value Chain Analysis

- Map the complete value chain associated with packaging agro-processed outputs.
- Identify key stakeholders and potential entry points for young entrepreneurs in the packaging industry.

b. Market Trends and User Preferences

- Analyze the current market landscape for agro-processing industry product packaging, such as market size and trend.
- Identify market opportunities for innovative packaging solutions.

c. Entrepreneurial Opportunities

- Identify specific niches and gaps within the agro-processing packaging sector suitable for startups.
- Assess the feasibility and success factors for young entrepreneurs considering the unique aspects of agro-processed products.

d. Guidelines for Startup Empowerment

- Develop comprehensive guidelines and recommendations tailored for young entrepreneurs aiming to establish startups in the agro-processing packaging sector.
- Include insights on funding options, regulatory considerations, and sustainable practices.

- Propose recommendations to create conducive business environment for innovation and entrepreneurship in agro-processing industry product packaging.

01.5: Approach and Methodology Pursued

01.5.1: A conceptual framework for the assignment

Anchored on discussions made on the introduction, objectives and scope of the assignment, the consulting firm primarily commences with developing a conceptual framework illustrated beneath which expounds the likely correlation among different elements of Examining agro processing industry product packaging in Ethiopia.

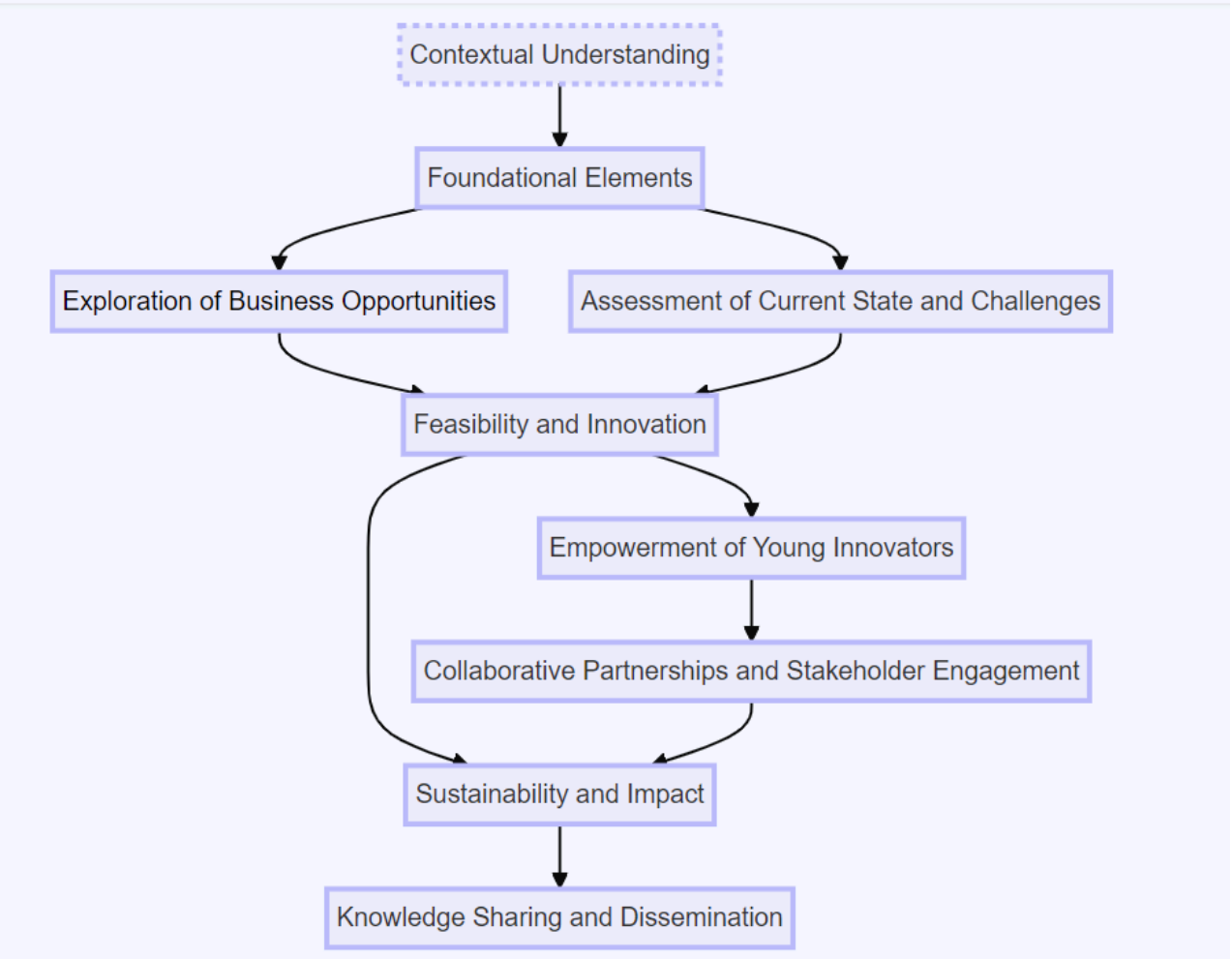

Figure 1. A conceptual framework for the assignment

The conceptual framework provides a structured approach for exploring business opportunities in agro-processing industry product packaging for young innovators. It encompasses foundational

elements to establish a contextual understanding, followed by an exploration of business opportunities and an assessment of the current state and challenges. The framework then focuses on feasibility and innovation, empowerment of young innovators, collaborative partnerships, sustainability and impact, and knowledge sharing and dissemination. This framework aims to facilitate informed decision-making and empower stakeholders in driving innovation and sustainable development within the agro-processing packaging sector.

Box 1: Conceptual Framework Components

Contextual Understanding:

- Contextualize the study within the broader context of the agro-processing industry, considering its significance in economic development, employment generation, and food security.
- Acknowledge the evolving consumer preferences, market dynamics, and technological advancements shaping the agro-processing sector and the packaging industry.

Foundational Elements

- Establish a foundational understanding of the agro-processing sector, emphasizing its diverse outputs, value chain dynamics, and the pivotal role of packaging in enhancing product quality, safety, and marketability.
- Recognize the unique challenges and opportunities inherent in the agro-processing industry, including issues related to post-harvest losses, market access, and sustainability.

Exploration of Business Opportunities

- Explore business opportunities in the packaging industry, acknowledging the potential for innovation, value addition, and entrepreneurship.
- Analyze market trends, consumer behavior, and regulatory frameworks to identify strategic entry points and niche markets for young innovators in agro-processing product packaging.

Assessment of Current State and Challenges

- Conduct a comprehensive assessment of the current state of product packaging in the agro-processing industry, examining existing practices, technologies, and infrastructures.

- Identify and analyze the challenges and constraints faced by stakeholders in product packaging, including issues related to cost-effectiveness, access to technology, and compliance with quality standards.

Feasibility and Innovation

- Evaluate the feasibility of implementing packaging innovations within the agro-processing industry, considering technical feasibility, economic viability, and environmental sustainability.
- Explore emerging trends and technologies in packaging, such as eco-friendly materials, smart packaging solutions, and value-added packaging concepts.

Empowerment of Young Innovators

- Empower young innovators through the provision of practical guidance, capacity-building initiatives, and access to resources and support networks.
- Develop tailored guidelines and recommendations to assist young entrepreneurs in navigating the complexities of the agro-processing packaging sector and establishing successful ventures.

Collaborative Partnerships and Stakeholder Engagement

- Foster collaborative partnerships and stakeholder engagement to leverage collective expertise, resources, and networks in supporting the growth and sustainability of the agro-processing packaging industry.
- Engage with government agencies, industry associations, academic institutions, and development organizations to create an enabling environment for innovation, entrepreneurship, and investment in agro-processing product packaging.

Sustainability and Impact

- Emphasize sustainability principles and practices in agro-processing product packaging, promoting resource efficiency, waste reduction, and environmental conservation.
- Measure the social, economic, and environmental impact of innovative packaging solutions on smallholder farmers, agribusinesses, consumers, and the broader ecosystem.

Knowledge Sharing and Dissemination

- Facilitate knowledge sharing and dissemination of study findings, best practices, and lessons learned through various channels, including workshops, seminars, publications, and digital platforms.

Empower stakeholders with actionable insights and tools to drive continuous improvement, innovation, and competitiveness in the agro-processing packaging sector.

01.5.2: Key Study Approach

The methodology section details the systematic approach used to examine business opportunities in the agro-processing industry's packaging sector in Ethiopia, which involves a wholistic strategy incorporating various methodologies and techniques.

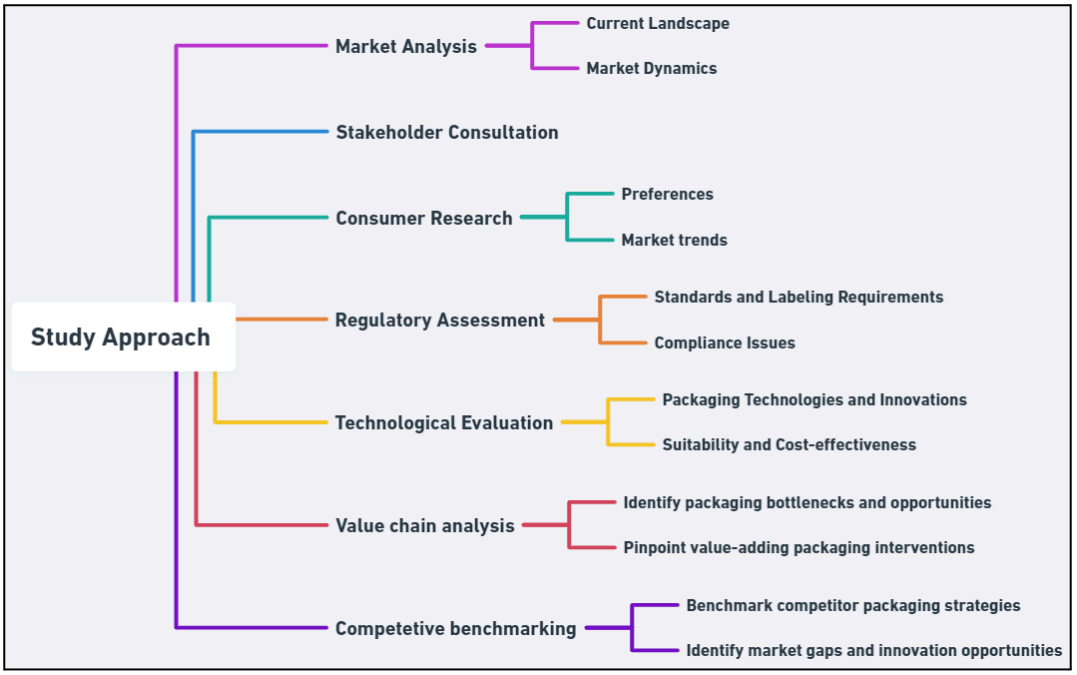

Figure 2. Study approach to assess business opportunities in agro-processing industry product packaging sector

The following box elaborates the major approaches charted above to pursue for undertaking the task.

Box 2: Approaches to be employed for the study

- **Market analysis**: conducting a thorough analysis of the agro-processing industry in Ethiopia to understand market trends, consumer preferences, and demand for packaged agricultural products. This involved assessing the current landscape, identifying key players, and analyzing market dynamics.
- **Stakeholder consultation:** engaged with stakeholders across the agro-processing value chain, including farmers, processors, packaging suppliers, distributors, retailers, and government agencies.
- **Consumer research**: conducted interviews with consumers to gain insights into their preferences, perceptions, and purchasing behavior regarding packaged agricultural products.
- **Regulatory assessment**: assessed the regulatory environment governing product packaging in Ethiopia, including standards, labeling requirements, and import/export regulations.
- **Technological evaluation**: evaluating available packaging technologies and innovations relevant to the agro-processing industry.
- **Value chain analysis**: conducting a value chain analysis of the agro-processing industry to identify bottlenecks, inefficiencies, and opportunities for value addition related to product packaging.
- **Competitive benchmarking**: benchmarking countries with good practice in the agro-processing industry.

The ensuing chart recapitulates the general methodological path from start to end.

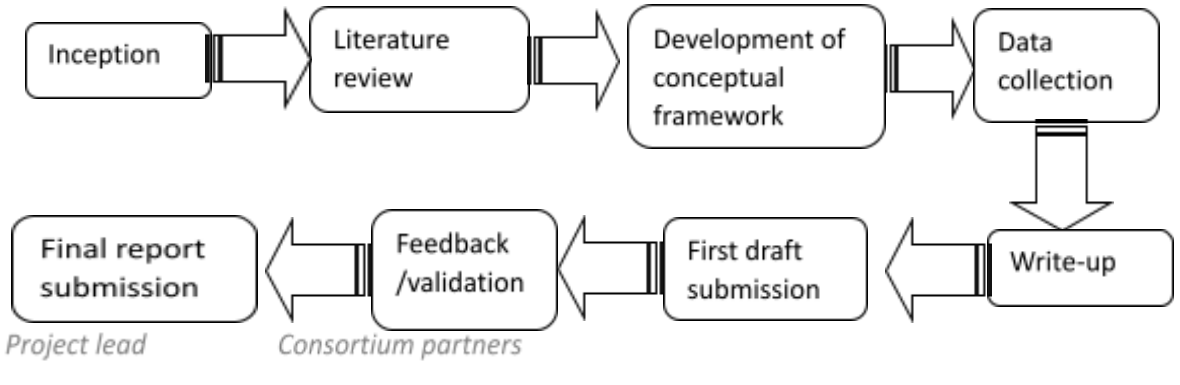

Figure 3. Methodological Path

01.5.3: Key Research Questions

The ensuing research questions of the study aim to explore challenges and opportunities in agro-processing packaging. Six key research questions are addressed, focusing on sector components, current practices, business opportunities, consumer preferences, feasibility, and practical recommendations.

i. What are the primary components of the agro-processing sector, and how does packaging contribute to value addition?

ii. What are the prevalent practices and challenges in agro-processing industry product packaging?

iii. What emerging business opportunities exist within the packaging industry, particularly for young entrepreneurs?

iv. What are the current consumer preferences regarding packaging in the agro-processing industry, and how do they influence demand for innovative solutions?

v. What criteria determine the feasibility of packaging innovations in the agro-processing sector, and how can barriers to adoption be addressed?

vi. What practical recommendations and guidelines can be formulated to support young entrepreneurs in establishing successful startups within the agro-processing packaging sector?

01.5.4: Types, Sources, And Method of Data Collection

To meet the study's objectives, a mix of primary and secondary sources was utilized to gather adequate and reliable data and information. The primary sources of data and information were agro processing firms, packaging industries, government offices including Ethiopian Statistical Services (ESS), Ethiopian Investment Commission (EIC), Plan and Development Commission (PDC); Ministry of Trade and Regional Integration (MoTRI), Ministry of Industry (MoI), Ministry of Agriculture (MoA), Agricultural Transformation Agency (ATA), Institute of Ethiopian Standards (IES), Ministry of Innovation and Technology (MoIT), and others.

Information was also gathered from associations such as chambers of commerce, think tanks, research centers, and multilateral organizations. Secondary information was collected from both published and unpublished documents and reports. Secondary data and information on agro-processing industries and packaging solutions existing in the form of texts, audio, or video recordings were collected and assessed. The study employed desk/literature reviews and

interviews. A detailed explanation of these instruments and their specific purposes was presented in the following subsection

Box 3: Synopsis of tools for the study

The Consultant used a number of tools for conducting qualitative techniques to answer the research questions.

- **Literature review:** The Consultant reviewed the available literature related to agro processing and packaging solutions. It includes government policy and strategies, researchers, legal frameworks, existing studies, and agricultural performances, initiatives taken to expand and modernizing the product packaging sectors, and international experience on packaging practices from both developed and developing countries. The review covered the concepts, types, and functions of packaging in the context of agro-processing industries, as well as the requirements and criteria for packaging.

- **Key Informant Interviews (KIIs) and In-house consultation:** The Consultant conducted a series of KIIs with prominent individuals, the representative of relevant ministries, and other organizations. The Consultant also engaged with relevant stakeholders on various aspects, i.e. selecting the relevant institutions, designing the questionnaires for KIIs, analyzing the collected data, undertaking inhouse consultation with the client and preparing the study report.

- **Developing interview protocol:** The consultant created an interview protocol that included questionnaires, a procedural guide, and a script to help the researcher obtain informed consent and focus on relevant information during the interviews.

01.5.4.1: Document Analysis

Document analysis checklist is prepared to undertake extensive desk review of relevant documents, studies and reports. In this regard, an in-depth desk review of documents on packaging practices and needs in the agro-processing industry was conducted. This review focused on key areas, including an overview of the sector's outputs and the role of packaging, current challenges, business opportunities for young entrepreneurs, demand for innovative packaging solutions, and the feasibility of packaging innovations. Additionally, the review aided in developing data collection tools.

Additionally, all relevant studies and documents on the study subject matters, such as the Ten-Year Perspective Development Plan and the Homegrown Economic Reforms, Growth and

Transformation Plan II, the agro-processing and packaging sectors performances have been reviewed. Published and unpublished relevant studies on agro processing and product packaging solution and needs, reports, and articles on the subject matter available at the Agricultural Transformation Agency, Ministry of Agriculture, universities, think-tank and research centers, and bilateral and multilateral organizations have also been reviewed to meet the study objectives.

In summary, the literature review involved gathering existing information from local, regional, and federal archives of the Ethiopian government, as well as from identified external institutions and organizations, alongside conducting a comprehensive review relevant to the current consulting assignment. Among others, the literature review includes a review and assessment of:

- National Policies and Strategy of Ethiopia;
- Macroeconomic performances trend and specifically review studies, reports, and articles that provide a comprehensive overview of the types of agro-processing activities prevalent in Ethiopia;
- Policy Brief in agro processing and product packaging in Ethiopia;
- National regulatory and institutional frameworks in relation to packaging industry;
- International experiences on agro-processing products-oriented packaging practice
- Role of packaging to enhance the value of agro-processing products
- Literature on the practices, technologies, and materials used in packaging agro-processing products
- Literature on potential entrepreneurial opportunities focusing on areas where innovation and local production can meet market needs effectively
- Analyses highlighting the growing demand for innovative packaging solutions tailored to Ethiopian agro-processing products,
- Case studies, success stories, and guidelines for implementing packaging innovations in the Ethiopian context.

01.5.4.2: Key Informant Interview

Key informants are individuals identified for the specific knowledge they have relating to a topic being covered by the study. The consultant developed a semi-structured interview guide to undertake in-depth interviews with key informants in sources identified on the subject matter.

Semi-structured interviews[1] are prepared addressing a host of issues on:

- Overview of agro-processing sector outputs and role of packaging,
- Current state and challenges in agro-processing product packaging,
- Business opportunities in the packaging industry for young entrepreneurs,
- Demand for innovative packaging solutions in agro-processing,
- Feasibility of packaging innovations and entrepreneurial guide, and
- Recommendations.

[1] *Semi-structured interviews allow informants the freedom to express their views in their own terms, it provides reliable, comparable qualitative data and enourages two-way communication.*

Audio recordings and on-site note-taking were used as appropriate, and the following table summarized the types, sources, and methods of data collection aligned with the specific research objectives.

Table 1. Types, sources and methods of data collection

S.no.	Specific Objective	Type of Data to be Collected	Method of Data Collection	Source of Data
1	Provide an overview of the agro-processing sector and its outputs, emphasizing the role of packaging in adding value to the products.	- Production data of various agro-processed products - Information on packaging materials used - Economic data related to value addition through packaging	- Review of existing literature and reports - Interviews with industry experts	- Research papers - Government reports - Industry publications - Interviews with industry experts - Interview responses from agro-processing businesses
2	Assess the current state of agro-processing industry product packaging and identify challenges therein.	- Packaging practices and standards - Challenges faced by agro-processing businesses in packaging	- Direct observations of packaging practices - Mini-survey and questionnaires distributed to agro-processing and packaging businesses - Interviews with key stakeholders	- Direct observations - Responses from interviews and questionnaires - Interview transcripts
3	Identify and analyze business opportunities within the packaging industry, with a strategic focus on creating pathways for	- Market trends and demands for packaging solutions - Potential niches and gaps in the packaging industry	- Market analysis and trend research - Interviews with potential clients and industry experts	- Market research reports - Interview transcripts

S.no.	Specific Objective	Type of Data to be Collected	Method of Data Collection	Source of Data
	young entrepreneurs.			
4	Assess the demand for innovative packaging solutions in the industry.	- Consumer preferences and expectations regarding packaging - Trends in innovative packaging solutions	- Questionnaires distributed to agro processors - Market analysis of current packaging trends	- Interview responses from agroprocessors - Market research reports
5	Assess the feasibility of packaging innovations and come up with a guide for young innovators in establishing business within agro-processing industry product packaging.	- Feasibility factors for packaging innovations - Resources required for implementing packaging innovations	- Case studies of successful packaging innovations - Interviews with entrepreneurs and experts - Financial analysis of potential packaging innovations	- Case study reports - Interview transcripts - Financial analysis reports
6	Develop practical recommendations and guidelines to assist young entrepreneurs in establishing startups within the agro-processing packaging sector.	- Successful business models in agro-processing packaging - Regulatory requirements and compliance standards - Support services available for startup entrepreneurs	- Case studies of successful startups - Review of regulatory frameworks - Interviews with regulatory agencies and support organizations	- Case study reports - Regulatory documents - Interview transcripts

01.5.5: Data Analysis

Data and information collected from both primary and secondary sources were carefully recorded, organized, transcribed, processed, analyzed, and interpreted using quantitative and qualitative analysis techniques to meet the study's objectives and scope.

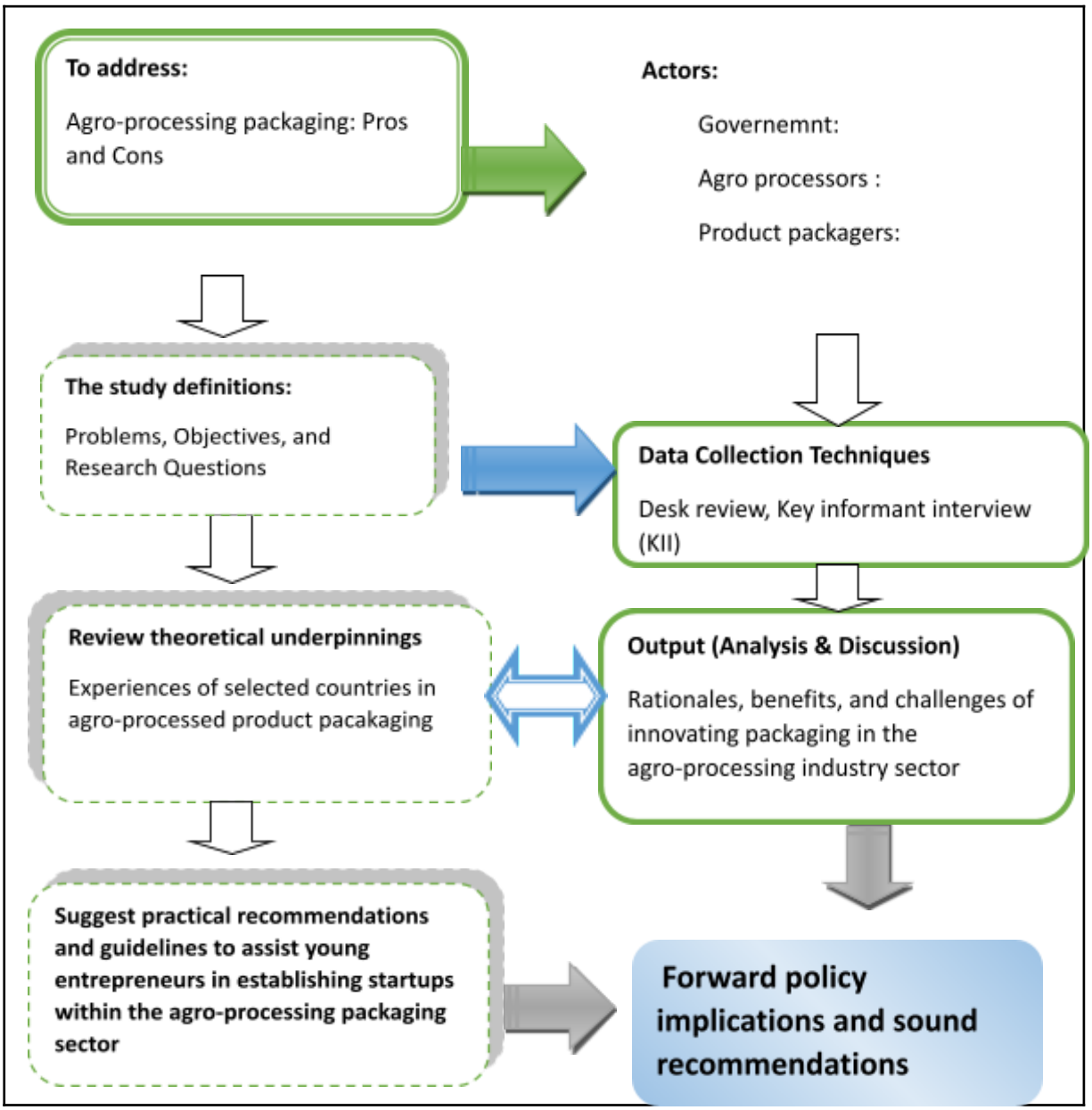

Figure 4: The study flowchart

01.5.5.1: Quantitative Data Analysis

The quantitative data were analyzed using analysis tools such as the Microsoft Xls and triangulated with qualitative information, and the results were summarized and presented through various formats such as pie charts, bar graphs, and tables

01.5.5.2: Data Analysis

Qualitative analysis techniques were used to evaluate feedback from key informants through content and thematic analysis. Content analysis identified patterns within and across multiple sources, while thematic analysis focused on meanings in the data. The qualitative data were presented in descriptive narratives to support the quantitative findings and address the study's objectives, allowing non-quantifiable data to be analyzed and used for triangulation.

01.6: Limitations of the study

The study faced several main challenges that could potentially affected its quality. To begin with, there was limited access to reliable data on agro-processing and packaging, which made analysis difficult. Economic instability and inflation also affected how accurately the market could be assessed. Navigating complicated regulations was challenging and took lengthy time. Further, a lack of skilled professionals in packaging technology limited the depth of the findings. Finally, high costs and a lack of awareness made it hard to evaluate sustainable packaging options

Chapter 02 – Literature Review

02.1: The concept and theoretical underpinnings of agro-industry product packaging

Agro-processing industry product packaging refers to the intricate process of designing, creating, and implementing packaging materials and methods specifically tailored for agricultural products that have undergone processing or value addition. This wholistically encompasses a variety of tasks aimed at safeguarding, enhancing, and marketing agro-processed goods, which may include fruits, vegetables, grains, meats, and dairy products. The primary objectives of packaging in this context are to prolong shelf life, preserve product quality, ensure food safety, facilitate transportation and storage, and convey essential information to consumers (Mengistu, A., Belachew, A., Mergia 2019).

Theoretical underpinnings guiding packaging decisions in agro-processing industry stem from various disciplines. Firstly, value chain theory positions packaging as a crucial part of the agricultural value chain, highlighting its role in adding value and improving the competitiveness and profitability of agro-processed products. It emphasizes packaging's importance in product

differentiation, value enhancement, and addressing consumer preferences across the production and distribution process (FAO 2016). Packaging decisions are largely shaped by consumer behavior, emphasizing the role of packaging in influencing perceptions, preferences, and purchasing decisions. Design, materials, labeling, and branding are strategically developed to align with target consumer segments, enhance product visibility, and communicate key attributes such as quality, freshness, and nutritional value (Kotler, P., Keller 2016).

Innovation theory drives packaging practices, advocating for continuous improvement, adaptation, and creativity in response to evolving market dynamics, technological advancements, and regulatory requirements. Innovations in packaging materials, designs, and technologies aim to address sustainability concerns, improve product performance, and meet evolving consumer demands for convenience, safety, and environmental responsibilities (Pike, S., Neale 2019).

Quality management theory is essential in shaping packaging decisions, focusing on delivering safe, consistent, and high-quality products to consumers. Packaging materials and processes are carefully chosen, monitored, and controlled to meet quality standards, regulatory requirements, and industry practices. Key principles of quality management include ensuring traceability, maintaining hygiene, and managing risks in packaging operations to protect consumer health (ISO 2015).

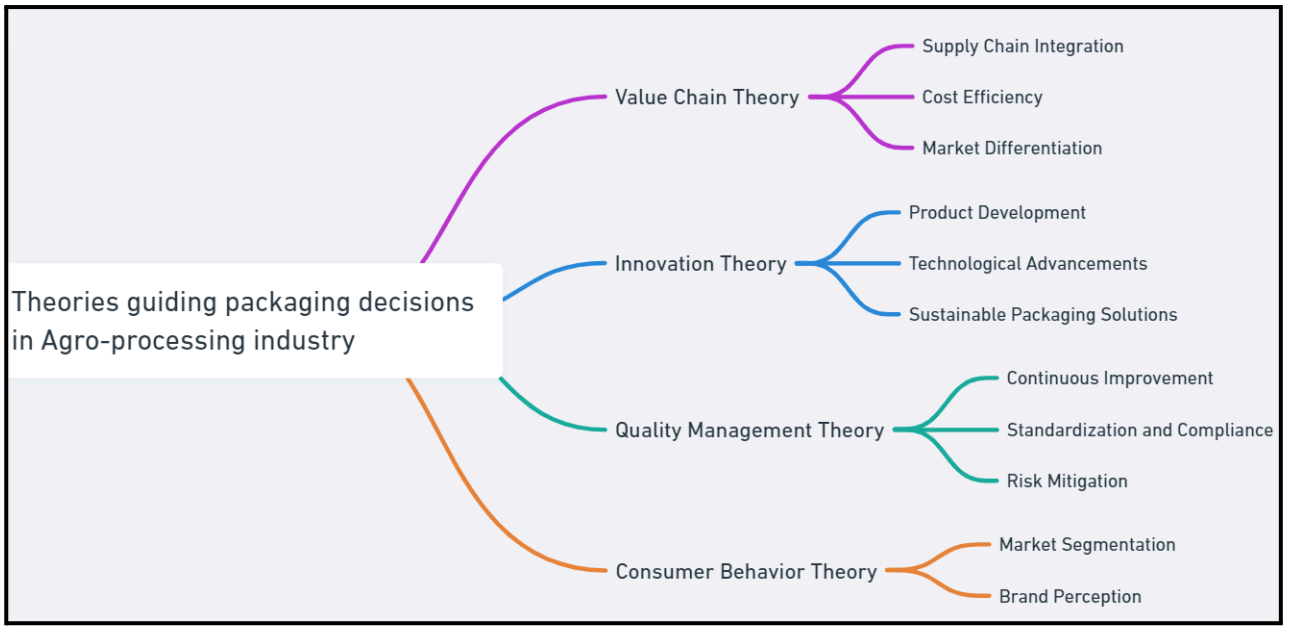

Figure 5: Theories of packaging decisions

In essence, the concept of product packaging in the agro-processing industry involves a comprehensive approach to designing and applying packaging materials and methods that improve the value, quality, safety, and marketability of agricultural products. As elaborated before, strategic packaging practices are shaped by theoretical frameworks from value chain theory, consumer behavior, innovation, and quality management, guiding decisions within the agro-processing sector.

02.2: Criteria for Packaging in the Agro-processing Industry

Packaging in the agro-processing industry must meet several criteria to ensure that products are protected, preserved, and presented effectively to consumers. These criteria encompass functionality, compliance with regulations, sustainability, cost efficiency, and aesthetics, each of which plays a critical role in the success of the packaged product.

02.2.1: Functionality

Functionality is the core criterion for packaging in the agro-processing industry. Packaging must protect the product from physical, chemical, and biological damage throughout its shelf life and during transportation. This includes protection from contamination, spoilage, and physical damage.

For example, Modified Atmosphere Packaging (MAP) is a common technique used to extend the shelf life of perishable products such as fruits, vegetables, and meat by altering the composition of the internal atmosphere of the packaging (Weiss, J., Gibis, M., Schuh, V., & Salminen 2010). This method reduces the oxygen levels, which slows down the growth of spoilage organisms and oxidation processes, thereby extending the product's freshness.

Vacuum packaging is another functional solution, especially for products like processed meats and cheeses. By removing air from the package, the growth of aerobic bacteria is inhibited, which helps in maintaining the quality and extending the shelf life of the product (Muthupandian, K., & Lakshminarayan 2017).

Moreover, packaging should facilitate the ease of handling, storage, and transportation. Packaging design plays a crucial role in ensuring that products are easily stackable and occupy minimal space, which is important for logistics and storage efficiency.

02.2.2: Compliance

Compliance with regulatory standards is essential to ensure that packaging materials are safe for food contact and that they do not pose any health risks. Regulatory bodies like the Ethiopian Food and Drug Authority (EFDA) provide guidelines on the materials that can be used for food packaging, the labeling requirements, and the overall safety of the packaging processes (EFDA 2022). Compliance with these regulations ensures that the packaging meets food safety standards, which is particularly important for products being exported to international markets.

In many countries, packaging must also comply with environmental regulations, such as the use of recyclable materials or the reduction of plastic waste. For example, the European Union has strict regulations on the use of certain chemicals in food packaging, such as Bisphenol A (BPA), which is restricted in many food contact applications (Arvanitoyannis, I. S., & Bosnea 2004). These regulations require companies to innovate and adopt safer alternatives in their packaging processes.

02.2.3: Sustainability

Sustainability has become a critical criterion in packaging, driven by consumer demand and environmental concerns. Sustainable packaging involves the use of materials and processes that minimize environmental impact throughout the product's lifecycle, from production to disposal.

Biodegradable and compostable packaging materials, such as those made from plant-based plastics, are increasingly being adopted as they break down more easily in the environment compared to traditional plastics (Effie, P., & Michail 2014). For instance, packaging made from polylactic acid (PLA), a biodegradable polymer derived from renewable resources like corn starch, is gaining popularity in the agro-processing industry due to its environmental benefits.

Recycling is another key aspect of sustainable packaging. The use of materials that can be easily recycled, such as glass, aluminum, and certain plastics, helps reduce the environmental footprint of packaging. In Germany, the "Green Dot" system incentivizes companies to use recyclable materials by imposing fees based on the recyclability of the packaging, thereby encouraging sustainable practices (Pagotto, M., & Fabbricino 2018).

Furthermore, companies are exploring ways to reduce the amount of packaging material used, which not only benefits the environment but also reduces costs. For example, lightweight packaging materials and the reduction of excess packaging layers are strategies being employed to minimize waste and resource use.

02.2.4: Cost Efficiency

Cost efficiency in packaging involves balancing the need for high-quality, functional packaging with the constraints of budget and resources. Companies must consider the cost of raw materials, manufacturing processes, and transportation when designing their packaging solutions.

High-quality packaging materials can be expensive, but they often offer better protection and longer shelf life, which can reduce overall costs by minimizing product loss and extending market reach (Seuring, S., & Müller 2018). For instance, while vacuum packaging or MAP might have higher initial costs, the extended shelf life and reduced spoilage can lead to significant savings in the long term.

On the other hand, cost-efficient packaging solutions, such as using locally available materials or simplifying packaging design, can be more affordable, especially for small and medium-sized enterprises (SMEs) in developing countries. These businesses often opt for simple, functional packaging that meets basic protective needs without incurring high costs (Keller, K. L., & Swaminathan 2019).

Innovative packaging designs that optimize space in shipping containers, such as stackable or collapsible packaging, can also lead to cost savings in transportation and storage. For example, using packaging that can be easily flattened when empty can reduce the volume required for return shipments, lowering transportation costs.

02.2.5: Aesthetics

Aesthetics play a vital role in packaging, especially in consumer-driven markets where the visual appeal of the product can influence purchasing decisions. Packaging design is often the first point of contact between the consumer and the product, making it a crucial element of marketing and brand identity.

Effective packaging design combines functionality with visual appeal, using color, shape, typography, and graphics to attract attention and convey brand values (Christensen, C. M., Bartman, T., & Van Bever 2016). For example, the use of vibrant colors and clear labeling can make a product stand out on the shelves, while minimalist designs may appeal to consumers seeking simplicity and elegance.

In addition to visual appeal, packaging must also offer a good user experience. Features such as resealable pouches, easy-open tops, and ergonomic designs enhance convenience for the consumer and can increase brand loyalty. For example, resealable packaging is particularly valued for products that are consumed over time, such as snacks or pet food, as it maintains product freshness and reduces waste (Muthupandian, K., & Lakshminarayan 2017).

The choice of packaging aesthetics also reflects the brand's commitment to quality and sustainability. For instance, premium products often use high-quality, aesthetically pleasing materials such as glass or metal, which not only protect the product but also enhance its perceived value.

02.3: Factors Influencing Packaging Choice in Agro-processing

The selection of packaging in the agro-processing industry is influenced by multiple factors, including the characteristics of the product, consumer preferences, regulatory requirements, cost considerations, and technological advancements. These factors collectively determine the most suitable packaging solutions for different products and markets.

02.3.1: Product Characteristics

The inherent characteristics of the agro-processed product are among the most significant factors influencing packaging choices. These characteristics include the product's shelf life, sensitivity to environmental factors, physical form, and the need for preservation.

Perishable products, such as fresh fruits, vegetables, and dairy products, require packaging that can extend their shelf life and protect them from spoilage. For instance, Modified Atmosphere Packaging (MAP) is used for fresh produce and meat products to reduce oxygen levels and delay spoilage (Almenar, E., Samsudin, H., Auras, R., & Harte 2017). This type of packaging is essential for maintaining the quality and safety of perishable goods during transportation and storage.

For products sensitive to light, such as dairy and certain beverages, opaque or light-resistant packaging materials are used to prevent degradation and maintain product quality (Bakalis, S.,

Valdramidis, V. P., Argyropoulos, D., Ahrne, L., Cullen, P. J., Gertsis, A. C., & Van Impe 2015). Similarly, moisture-sensitive products like grains and cereals require packaging that is moisture-resistant to prevent mold growth and spoilage.

The physical form of the product—whether it is solid, liquid, or powder—also dictates the type of packaging required. Liquids, for instance, require leak-proof packaging, while powders may need packaging that prevents clumping and exposure to humidity.

02.3.2. Consumer Preferences

Consumer preferences are increasingly shaping packaging choices, with growing demand for sustainable, convenient, and aesthetically pleasing packaging. Modern consumers are more conscious of the environmental impact of packaging and prefer products that use eco-friendly materials and designs.

The shift towards sustainability has led to an increase in the use of recyclable, biodegradable, and reusable packaging materials. Consumers are willing to pay a premium for products that align with their values, such as those packaged in materials that reduce environmental harm (Chikweche, T., & Fletcher 2012). This trend is particularly strong among younger consumers who prioritize sustainability in their purchasing decisions.

Convenience is another key factor influenced by consumer preferences. Packaging that is easy to open, reseal, or use on the go is highly valued in today's fast-paced lifestyle. For example, single-serve packaging, ready-to-eat meals, and portable snack packs are popular among consumers who seek convenience without compromising on quality (Effie, P., & Michail 2014).

The visual appeal of packaging also plays a crucial role in influencing consumer behavior. Attractive packaging designs that stand out on the shelf can draw consumers' attention and influence their purchasing decisions. Brands often use packaging as a tool to differentiate their products and create a memorable consumer experience (Keller, K. L., & Swaminathan 2019).

02.3.3: Regulatory Requirements

Regulatory requirements are a critical factor in packaging choices, particularly for food products. These regulations ensure that packaging materials are safe for food contact, do not contain harmful substances, and provide accurate information to consumers.

In Ethiopia, the Ethiopian Food and Drug Authority (EFDA) sets out guidelines for food packaging that include material safety, labeling requirements, and environmental considerations (EFDA 2022). Compliance with these regulations is essential to avoid legal issues and ensure that products meet both local and international standards.

For companies exporting products, it is important to adhere to the packaging regulations of the target market. Different countries have varying regulations regarding food contact materials,

labeling, and environmental impact, which can influence the choice of packaging materials and designs (Arvanitoyannis, I. S., & Bosnea 2004).

Additionally, regulations related to environmental sustainability, such as restrictions on single-use plastics and mandates for recyclable materials, are becoming increasingly common. Companies must navigate these regulations to ensure their packaging solutions are compliant and sustainable.

02.3.4: Cost Considerations

Cost considerations are a major factor in packaging decisions, as companies must balance the need for high-quality packaging with budget constraints. The cost of raw materials, manufacturing processes, and transportation all influence the choice of packaging.

While high-quality materials may offer better protection and longer shelf life, they often come at a higher cost. Companies must assess whether the benefits of premium packaging materials justify the additional expense, especially in competitive markets (Seuring, S., & Müller 2018).

For small and medium-sized enterprises (SMEs), cost-effective packaging solutions are crucial. These businesses often opt for simpler packaging designs that meet basic functional needs without incurring high costs. Local sourcing of packaging materials can also reduce costs and support the local economy (Christensen, C. M., Bartman, T., & Van Bever 2016).

Technological advancements, such as automation and digital printing, can also reduce packaging costs by streamlining production processes and enabling mass customization. For example, digital printing allows for shorter print runs and quicker turnaround times, making it a cost-effective solution for limited edition or seasonal products (Pagotto, M., & Fabbricino 2018).

02.3.5: Technological Advancements

Technological advancements in packaging have revolutionized the agro-processing industry, offering new solutions that enhance product protection, extend shelf life, and improve sustainability. These innovations include smart packaging, biodegradable materials, and advanced sealing technologies.

Smart packaging, which incorporates sensors and indicators, can monitor the condition of the product and provide real-time information on factors such as temperature, humidity, and freshness (Keller, K. L., & Swaminathan 2019). This technology is particularly useful for perishable products, as it helps ensure that they are stored and transported under optimal conditions.

Biodegradable and compostable materials are gaining traction as sustainable alternatives to traditional plastics. These materials, such as polylactic acid (PLA) and polyhydroxyalkanoates (PHA), offer the same protective qualities as conventional plastics but break down more easily in the environment, reducing the packaging's ecological footprint (Effie, P., & Michail 2014).

Advanced sealing technologies, such as heat sealing and ultrasonic sealing, improve the integrity of packaging and reduce the risk of contamination. These technologies are especially important for products that require airtight or vacuum-sealed packaging, such as processed meats and ready-to-eat meals (Almenar, E., Samsudin, H., Auras, R., & Harte 2017).

The adoption of these technologies not only enhances the functionality and sustainability of packaging but also provides companies with a competitive edge in the market. By staying at the forefront of packaging innovation, companies can meet consumer demands and regulatory requirements while reducing costs and environmental impact.

02.4: Countries' Best Practices in Agro-processing Packaging

Examining best practices in agro-processing packaging across different countries, both developed and developing, provides valuable insights into innovative and effective approaches that can be adapted to other contexts, including Ethiopia. This section explores the packaging practices in countries such as Germany, India, Kenya, and the United States, highlighting their strategies for sustainability, technology adoption, and regulatory compliance.

02.4.1. Kenya

Kenya represents an example of how a developing country can successfully adopt innovative packaging practices to support its agro-processing industry. The country's approach is characterized by a focus on sustainability, local materials, and capacity building for small and medium-sized enterprises (SMEs).

One of the key practices in Kenya is the use of locally sourced and biodegradable packaging materials. For example, packaging made from sisal, banana leaves, and other agricultural residues is commonly used for fruits, vegetables, and traditional snacks (Pagotto, M., & Fabbricino 2018). These materials are not only sustainable but also affordable, making them accessible to small-scale producers.

Kenya is also investing in capacity building to enhance the packaging skills and knowledge of SMEs. Initiatives such as training programs and workshops organized by organizations like the Kenya Institute of Packaging (KIP) aim to educate producers on best practices in packaging, including the use of modern technologies and compliance with international standards (Keller, K. L., & Swaminathan 2019). These efforts are helping to improve the quality of packaging in the agro-processing sector and open up new opportunities for export.

Furthermore, Kenya has adopted regulatory frameworks that support sustainable packaging practices. The government's ban on plastic bags in 2017 has led to increased use of alternative packaging materials and a greater focus on environmental sustainability in the packaging industry (Arvanitoyannis, I. S., & Bosnea 2004).

02.4.2: India

India's agro-processing industry is rapidly growing, and with it, the demand for innovative and cost-effective packaging solutions. The country faces unique challenges related to its diverse climate, infrastructure limitations, and the need to balance modern practices with traditional methods.

One of the best practices in India is the widespread use of flexible packaging materials, such as laminated pouches and sachets, which offer a cost-effective and lightweight solution for protecting agro-processed products. These materials are particularly suitable for small-scale producers and are commonly used for packaging spices, tea, and snacks (Chikweche, T., & Fletcher 2012). Flexible packaging is favored for its affordability, ease of transport, and ability to preserve the freshness of products in a hot and humid climate.

India is also making strides in sustainable packaging, with a growing emphasis on reducing plastic waste. The government has implemented regulations that restrict the use of single-use plastics, prompting companies to explore alternatives like biodegradable and compostable materials. For instance, packaging made from areca palm leaves and jute is gaining popularity as an eco-friendly option, particularly for food products (Effie, P., & Michail 2014).

In addition, the adoption of active packaging technologies, such as oxygen scavengers and ethylene absorbers, is helping to extend the shelf life of perishable products like fruits and vegetables. These technologies are crucial in reducing post-harvest losses, which are a significant challenge in India's agro-processing sector (Weiss, J., Gibis, M., Schuh, V., & Salminen 2010).

02.4.3: Germany

Germany is renowned for its strong commitment to sustainability and innovation in packaging. The country's approach is characterized by stringent environmental regulations, high levels of consumer awareness, and a well-developed recycling infrastructure.

One of Germany's key initiatives is the "Green Dot" system, which incentivizes manufacturers to reduce packaging waste and increase the recyclability of their products. Under this system, companies pay fees based on the volume and recyclability of their packaging, encouraging them to use materials that are easier to recycle, such as paper, glass, and certain types of plastics (Pagotto, M., & Fabbricino 2018). This initiative has significantly reduced packaging waste and increased recycling rates across the country.

Germany also leads in the adoption of innovative packaging technologies. For example, the use of smart packaging solutions, such as RFID tags and QR codes, allows for better tracking and monitoring of products throughout the supply chain. These technologies improve supply chain transparency, enhance product safety, and provide consumers with valuable information about the origin and quality of the products they purchase (Keller, K. L., & Swaminathan 2019).

Furthermore, Germany's focus on sustainable packaging extends to the use of biodegradable and compostable materials. Companies in the agro-processing industry are increasingly adopting materials like polylactic acid (PLA) and cellulose-based films, which offer the same protective qualities as traditional plastics but have a lower environmental impact (Effie, P., & Michail 2014). This shift towards sustainable materials is driven by both regulatory requirements and consumer demand for eco-friendly products.

02.4.4. United States

The United States has a diverse and advanced packaging industry that emphasizes innovation, convenience, and sustainability. The country's approach to agro-processing packaging is driven by consumer preferences, technological advancements, and regulatory standards set by bodies like the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA).

One of the key trends in the U.S. agro-processing packaging industry is the adoption of smart packaging technologies. For example, time-temperature indicators (TTIs) and freshness sensors are increasingly used in packaging to monitor the quality of perishable products. These technologies help reduce food waste by providing real-time information about the freshness and safety of products, allowing consumers to make informed decisions (Bakalis, S., Valdramidis, V. P., Argyropoulos, D., Ahrne, L., Cullen, P. J., Gertsis, A. C., & Van Impe 2015).

The U.S. also places a strong emphasis on convenience in packaging. The rise of e-commerce has led to an increase in demand for packaging that is easy to open, resealable, and suitable for home delivery. This has driven innovations such as tamper-evident packaging, portion-controlled packaging, and packaging designed for single-use or on-the-go consumption (Muthupandian, K., & Lakshminarayan 2017).

Sustainability is another major focus in the U.S., with companies increasingly adopting eco-friendly packaging solutions. The use of recycled materials, biodegradable plastics, and plant-based packaging is on the rise, driven by both consumer demand and regulatory pressure to reduce environmental impact (Arvanitoyannis, I. S., & Bosnea 2004). For example, companies like PepsiCo and Coca-Cola have introduced plant-based bottles made from renewable resources, reducing their reliance on fossil fuels and lowering their carbon footprint.

The following table summarizes selected country practices on packaging.

Table 2: Selected countries best practices on packaging

No	Country	Author/s	Lessons learnt
		1. Developed countries practice	

No	Country	Author/s	Lessons learnt
	USA	Cousté et al. (2012)	For packaging to succeed in the USA, effective communication strategies, innovation and integrated marketing play strategic roles. ● Packaging claims—ranging from environmental to nutritional—affect firm value, though their impact varies by sector, with environmental claims showing limited influence, possibly due to consumer skepticism. A trend toward multiple claims on packaging suggests a need for effective communication strategies, with market orientation, innovation, and integrated marketing being key to leveraging packaging for success.
		Arvanitoyannis, I. S., & Bosnea (2004); Bakalis, S. et al (2015); Muthupandian, K., & Lakshminarayan (2017)	● Adoption of smart packaging technologies such as time-temperature indicators (TTIs) to monitor the quality of perishable products. ● Adoption and expansion of convenience packaging solutions such as tamper-evident packaging, portion-controlled packaging, and packaging designed for single-use or on-the-go consumption. ● Use of recycled materials, biodegradable plastics, and plant-based packaging.
	Germany	● Effie, P., & Michail (2014); Keller, K. L., & Swaminathan (2019); Pagotto, M., & Fabbricino (2018);	● Germany introduced a 'Green Do' system which incentivizes manufacturers to reduce packaging waste and increase the recyclability of their products. ● The country's commitment to circular economy principles also includes a successful deposit return system for beverage containers, which incentivizes recycling[2]. ● Adoption and extensive use of innovative packaging such as smart packaging solutions like RFID tags and QR codes in the country for better tracking and

[2] https://www.bvl.bund.de/EN/Home/home_node.html

No	Country	Author/s	Lessons learnt
			monitoring of products throughout the supply chain use of biodegradable and compostable materials.
		1. Developing countries practice	
1	Nigeria	Owolabi and Isaac (2009)	• Product packaging color, size, information, and material quality is found to significantly influence consumers' buying behaviour of agro-processed food products in Nigeria. The development of innovative, consumer-friendly packaging designs such as resealable pouches and portion-sized packs tailored to the local market's preferences positively influence consumers behaviour.
2	Ghana	(Kwaku & Fan, 2020)	• Effective product design and packaging is observed to have an impact on the market value and performance of agricultural products in the Ghanaian market. Inadequate packaging quality and design in Ghana hampers the competitiveness of local agricultural products compared to foreign counterparts. Elements identified in packaging that influence buyers' decision encompass visual appeal informational content, Material quality, protection and preservation, cultural relevance, convenience, and differentiation.
3	India	Nayyar (2012)	• Eco friendliness, protection and attractive design packages can influence up to four-fifth of consumers' purchase decision in India. Such packaging features can reduce advertising costs, enhances shelf life, and significantly impact consumers' behavior, making essential for brand success.
4	Zambia	Black et al. (2020)	Targeted government capacity building programs in packaging sector supported by NGOs yield positive outcomes.

No	Country	Author/s	Lessons learnt
			• In Zambia, initiatives such as the Private Enterprise Programme Zambia (PEPZ), funded by the UK government, supports the agriculture sector through its 'Value Chain Strengthening Initiative' focusing on three main areas: capital (co-investment and financial design), capacity (providing technical and advisory support), and connections (building market linkages). PEPZ is demonstrated to help strengthen the links between producers, food aggregators, processors, packaging providers, logistics firms, and retailers, aiming to improve the overall food value chain.
5	Kenya	Jepchumba et al., (2022)	Attractive package designs, illustrative and descriptive labels, and clear, consistent branding positively influence firm performance in manufacturing sector. • Packaging shapes consumer perceptions, supports product differentiation through innovative designs, and drives sales and market share growth. Sustainable and accessible packaging has manifested a growing importance along with the impact of effective strategies on brand loyalty, and the need for firms to invest in packaging development to remain competitive in the evolving market landscape. In general, product packaging and labeling is found to enhance the performance of food and beverage manufacturing firms in Kenya.
		Arvanitoyannis, I. S., & Bosnea, (2004) ; Keller, K. L., & Swaminathan (2019) ;	• Use of locally sourced and biodegradable packaging materials. • Capacity building to enhance the packaging skills and knowledge of SMEs. • Regulatory frameworks adopted to support sustainable packaging practices.

No	Country	Author/s	Lessons learnt
		Pagotto, M., & Fabbricino (2018)	
5	India	Chikweche, T., & Fletcher (2012; Effie, P., & Michail (2014); Weiss, J., Gibis, M., Schuh, V., & Salminen (2010)	• Use of flexible packaging materials, such as laminated pouches and sachets, notably for small scale producers which offer a cost-effective and lightweight solution for protecting agro-processed products. • Regulations implemented to restrict the use of single-use plastics • Adoption of active packaging technologies, that help to extend the shelf life of perishable products like fruits and vegetables
		Bathla & Kannan, (2021)	• India supports its food processing and packaging industries with different policy and tax incentive measures including: o Tax-exemption for new food processing units for the first 5 years, with a 25% tax reduction for the next 5 years. o Reduction in excise duties on refrigerated containers and packaging machinery to 6%, and customs duties for cold storage infrastructure to 5%. o Service tax exemptions to processes like precooling, packaging, and the transportation of key food items.
6	Ethiopia	Urugo et al., (2024)	• Ethiopia initiated the establishment of agro-industrial parks such as Bulbula, Bure, Yirgalem, and Humera, in key agricultural producing areas with a focus on brining efficient packaging, processing, and preservation to reduce postharvest losses and enhance the value chain.

02.5: The State of Agro-processing Packaging Industries in Ethiopia

The packaging industry in Ethiopia is still in its developmental stages, with significant potential for growth and improvement. This section discusses the current state of the agro-processing packaging industry in Ethiopia, including its challenges, opportunities, and the role of key stakeholders.

02.5.1: Current State and Challenges

Ethiopia's agro-processing sector is a key driver of economic growth, but the packaging industry faces several challenges that hinder its development. These challenges include limited access to modern packaging technologies, a lack of skilled labor, and insufficient infrastructure.

One of the major challenges is the reliance on imported packaging materials and machinery, which increases costs and limits the competitiveness of local producers (Keller, K. L., & Swaminathan 2019). The high cost of importing packaging materials, such as plastic films and aluminum foils, makes it difficult for small and medium-sized enterprises (SMEs) to afford high-quality packaging solutions. Additionally, the lack of local manufacturing capacity for packaging materials means that producers must often wait for long lead times to receive imported goods, further delaying production and distribution.

The limited availability of skilled labor in the packaging industry is another significant challenge. There is a shortage of professionals with expertise in modern packaging technologies and design, which affects the quality and innovation of packaging solutions in the country (Seuring, S., & Müller 2018). This skills gap is exacerbated by the lack of formal training programs in packaging technology and the absence of specialized institutions dedicated to packaging education.

Infrastructure limitations, such as inadequate storage facilities and poor transportation networks, also pose challenges for the agro-processing packaging industry in Ethiopia. These issues contribute to high post-harvest losses and reduce the effectiveness of packaging in preserving product quality during storage and transportation (Christensen, C. M., Bartman, T., & Van Bever 2016). The lack of cold chain infrastructure, in particular, is a significant barrier to the packaging of perishable products like fruits, vegetables, and dairy

2.5.2: Opportunities for Growth

Despite these challenges, there are significant opportunities for growth in Ethiopia's agro-processing packaging industry. The government's focus on industrialization and value addition in agriculture presents a favorable environment for the development of the packaging sector.

One of the key opportunities lies in the increasing demand for packaged food products in both domestic and international markets. As consumer preferences shift towards convenience and

quality, there is a growing need for innovative packaging solutions that can meet these demands (Chikweche, T., & Fletcher 2012). This trend is particularly evident in urban areas, where consumers are increasingly seeking packaged foods that offer convenience and longer shelf life.

The rise of export-oriented agro-processing industries also presents opportunities for the packaging sector. As Ethiopia aims to increase its agricultural exports, there is a need for packaging that meets international standards and appeals to global markets (Almenar, E., Samsudin, H., Auras, R., & Harte 2017). This includes packaging solutions that ensure product safety, extend shelf life, and provide tamper evidence, all of which are critical for export success.

Furthermore, the availability of locally sourced raw materials, such as agricultural residues, offers opportunities for the development of sustainable and cost-effective packaging solutions. For example, the use of banana leaves, enset (false banana), and other biodegradable materials for packaging traditional Ethiopian products could cater to the growing demand for eco-friendly packaging (Effie, P., & Michail 2014).

The Ethiopian government's initiatives to improve infrastructure, such as the construction of industrial parks and the expansion of transportation networks, also provide opportunities for the packaging industry. These developments are expected to enhance the efficiency of the supply chain, reduce post-harvest losses, and support the growth of the packaging sector (Pagotto, M., & Fabbricino 2018).

02.5.3: Role of Key Stakeholders

The development of the agro-processing packaging industry in Ethiopia requires the active participation of key stakeholders, including the government, private sector, and educational institutions.

The government plays a crucial role in creating a conducive environment for the growth of the packaging industry. This includes implementing policies that support the development of local packaging manufacturing capacity, providing incentives for investment in modern packaging technologies, and promoting research and development in sustainable packaging solutions (Arvanitoyannis, I. S., & Bosnea 2004). The government's commitment to improving infrastructure and reducing barriers to trade also supports the growth of the packaging sector.

The private sector, particularly SMEs, is a key driver of innovation and growth in the packaging industry. By investing in modern packaging technologies and adopting best practices from other countries, Ethiopian companies can improve the quality and competitiveness of their packaging solutions (Muthupandian, K., & Lakshminarayan 2017). Collaboration between local companies and international partners can also facilitate the transfer of knowledge and technology, further enhancing the capabilities of the packaging industry.

Educational institutions and training centers play a vital role in addressing the skills gap in the packaging industry. By offering specialized programs in packaging technology and design, these institutions can equip the next generation of professionals with the skills needed to drive innovation

and growth in the sector (Weiss, J., Gibis, M., Schuh, V., & Salminen 2010). Partnerships between academia and industry can also foster research and development in packaging, leading to the creation of new and improved packaging solutions.

02.6: Regulatory Requirements and Compliance for Packaging in Agro-processing Industries in Ethiopia

Regulatory requirements and compliance are critical factors that influence the packaging industry, particularly in the agro-processing sector. This section explores the regulatory landscape in Ethiopia, focusing on the standards and regulations that govern packaging in the agro-processing industry, as well as the challenges and opportunities associated with compliance.

02.6.1: National Packaging Standards

In Ethiopia, packaging standards are primarily governed by the Ethiopian Standards Agency (ESA) and the Ministry of Trade and Industry. These standards cover various aspects of packaging, including material safety, labeling requirements, and environmental impact.

The Ethiopian Standards Agency has developed specific standards for packaging materials used in the food and beverage industry. These standards are designed to ensure that packaging materials are safe for food contact, do not contaminate the product, and provide adequate protection during storage and transportation (Keller, K. L., & Swaminathan 2019). For example, the standards specify the types of materials that can be used for food packaging, such as food-grade plastics, glass, and metals, and outline the requirements for sealing, labeling, and storage conditions.

Compliance with these standards is mandatory for companies operating in the agro-processing sector. Failure to adhere to the standards can result in penalties, product recalls, and damage to the company's reputation (Seuring, S., & Müller 2018). Therefore, it is essential for companies to stay informed about the latest packaging standards and ensure that their packaging solutions meet these requirements.

02.6.2: Environmental Regulations

Environmental regulations are becoming increasingly important in the packaging industry, particularly in response to global concerns about plastic waste and sustainability. In Ethiopia, the government has introduced regulations aimed at reducing the environmental impact of packaging, including restrictions on single-use plastics and mandates for recyclable materials.

One of the key environmental regulations in Ethiopia is the ban on certain types of single-use plastics, such as plastic bags and straws. This regulation has prompted companies to explore alternative packaging materials, such as biodegradable and compostable options (Arvanitoyannis, I. S., & Bosnea 2004). The use of eco-friendly packaging materials is not only a regulatory requirement but also aligns with consumer preferences for sustainable products.

The Ethiopian government is also promoting the adoption of the circular economy model, which emphasizes the reuse, recycling, and reduction of packaging waste. This approach encourages companies to design packaging that can be easily recycled or repurposed, thereby reducing the overall environmental footprint of the packaging industry (Effie, P., & Michail 2014). Companies that adopt sustainable packaging practices can benefit from government incentives, such as tax breaks and grants, as well as improved consumer trust and brand loyalty.

02.6.3: International Standards and Trade Regulations

For companies involved in exporting agro-processed products, compliance with international packaging standards is crucial. These standards are often set by international organizations such as the International Organization for Standardization (ISO) and the Codex Alimentarius Commission, and they cover a wide range of packaging requirements, including material safety, labeling, and environmental impact.

One of the key international standards relevant to agro-processing packaging is ISO 22000, which outlines the requirements for food safety management systems, including packaging. Compliance with ISO 22000 ensures that packaging materials are safe for food contact and do not pose any health risks to consumers (Muthupandian, K., & Lakshminarayan 2017). This standard is particularly important for companies that export food products to international markets, as it is often a prerequisite for market access.

In addition to ISO standards, companies must also comply with the packaging regulations of the target market. Different countries have varying regulations regarding food contact materials, labeling, and environmental impact, which can influence the choice of packaging materials and designs (Arvanitoyannis, I. S., & Bosnea 2004). For example, the European Union has strict regulations on the use of certain chemicals in packaging materials, such as bisphenol A (BPA) and phthalates, which are known to pose health risks. Companies exporting to the EU must ensure that their packaging complies with these regulations to avoid trade barriers and ensure consumer safety.

Moreover, regulations related to environmental sustainability, such as restrictions on single-use plastics and mandates for recyclable materials, are becoming increasingly common. Companies must navigate these regulations to ensure their packaging solutions are compliant and sustainable. Compliance with international standards and trade regulations not only facilitates market access but also enhances the company's reputation and competitiveness in the global market.

Chapter 03- Analysis and Findings

03.1: Economic progress and agricultural trends in Ethiopia: a comprehensive overview

03.1.1: Macroeconomic performances of Ethiopia

Improving agricultural productivity in Ethiopia is crucial to alleviate poverty and meet growing food demand amid environmental stress and climate change. Agricultural innovation and access to digital agricultural solutions have the potential to boost productivity while reducing negative environmental footprints in agriculture and food system value chains (CCA 2022).

Ethiopia's real GDP has been growing by an average annual growth rate of 8.9% between 2015/16 and 2022/23 (NBE 2024). Phenomenal growth (10.1%) recorded average per annum in the 2010/11 – 2014/15 period and decelerated to a yearly average of 7.8% during the 2015/16 to 2022/23-time span. Specially it has been slowing down averaging at 6.5% over the past three years, with a decelerated 6.3% growth in 2020/21(NBE 2024). Yet, it is the fourth-largest economy in Sub-Saharan Africa with a GDP at the current market price of USD 107.6 billion in 2019/20 and 163.69 in 2020/21(PDC 2020; NBE 2024). Ethiopia has been among the fastest-growing economies albeit the slowing trend in recent times mainly because of conflicts in the northern and other regions of the country, Covid 19 pandemic, and policy adjustments that involved fiscal consolidation to stabilize the public debt (PDC 2020; NBE 2024). Given the famine and political unrest in various parts of the country, this decline in growth may continue shortly. Yet, the country's 10 years development perspective plan (2020-2030) aspires to attain an average annual GDP growth of 10% (PDC 2020). As per the plan, there is an aim to uplift the GDP sectoral share of industry from 27.8% in 2020 to 35.9% in 2030 and reduce agriculture's share from 32.8% in 2020 to 22% in 2030.

The GDP per capita income has been growing, attaining USD 1,549 in 2022/23 from USD 815 in 2015/16 (NBE 2024). The proportion of people living below the poverty line significantly reduced to 19% in 2020 from 29.6% in 2011 (PDC 2020). As per NBE (2024) the service sector takes the largest share of GDP in 2022/23 with 40.3% of the total, followed by agriculture (32.1%) and industry (28.8%). The NBE time series data shows that agriculture was the dominant sector with a 51.6 percent share in 2003/04 followed by the service (37%) and industry (10.9%) sectors. Agriculture lost its dominance in 2010/11 as the service sector's contribution to the national GDP climbed to 45.23 percent (while the agricultural sector's share fell to 44.37 percent). The contribution of the industrial sector during these years remained stable as its contribution varied only between 10.1 and 10.9 percent.

During the subsequent years (starting from 2011/12 up to 2022/23) the service sector remained the leading sector followed by the agriculture and industrial sectors. In 2010/11 and onwards showed signs of structural transformation as the contribution of the sectors started to shift. Although agriculture has undoubtedly lost its leading position, the data shows that the direction of the transformation got blurred in recent years as the contribution of the three sectors is showing signs of convergence in the year 2022/23. But clearly, the service sector is leading the pack during the mentioned years. Another dominant fact that one can easily draw from the national GDP data between the years 2010/11 to 2022/23 is the continual growth of the contribution of the industrial sector to the national GDP. This sector's contribution, which used to stand at 10.4 percent in 2010/11 reached about 29 percent in 2022/23. This is mainly because of the attention the government gave to the structural transformation of the economy.

According to a report by the IMF (2020[3]) report, the country's macro-economic indicators point to a more mixed picture: public investment was subdued, given government actions to control Ethiopia's debt accumulation and to limit budgetary capital outlays in the face of revenue shortfalls; merchandise exports and imports both declined in volume terms; electricity output rose by less than 1 percent; the output of cement products declined by 2.5 percent, although production of iron and steel rose by 11 percent.

03.1.2: Agriculture in Ethiopia: An Overview of Key Trends

Agriculture in Ethiopia is dominated by smallholder farming systems, which together produce more than 90% of agricultural output and cultivates more than 90% of the entire cropland. In recent decades, agricultural production has made some progress; however, it needs further transformation to increase crop production in smallholder farming systems while adapting to and mitigating climate change (Zerssa et al. 2021). The sector is the main pillar of Ethiopia's economy, employing 75% of the labor force, accounting for 32% of GDP (CCA 2022; NBE 2024). Approximately 95% of Ethiopian agriculture is rain-fed small-scale farming characterized by low-input, low-output subsistence practices (CCA 2022). Nearly 82% of Ethiopia's exports come from agriculture, with crops and livestock making up 76.5% and 3.5% of the share, respectively (NBE 2024).

Since the 1990s, Ethiopia has focused on agricultural-led industrialization (ADLI[4]) backed by implementing various nation-wide five years development plans such as PASDEP[5], GTP I[6], GTP II, and the ongoing 10-years perspective(NPC 2020). These initiatives aim to boost agricultural production and productivity to drive the industrial sector. However, the results have fallen short of expectations.

Major agricultural practices in Ethiopia include crop production, pastoral and mechanized/ specialized commercial farming. Between 2016/17 and 2020/21, the country cultivated an average of 12.76 million hectares of land, with cereal crops occupying the majority (71.5%), followed by pulses (11%), oilseeds (5.5%), and coffee (5.3%) (EPDC 2020; CSA 2021). During this period, total production averaged 405.3 million quintals, with cereals contributing the largest share (69%), followed by root crops (12%) and pulses (7.4%). Crop area expanded by 1.4% annually, while production increased by 4.4% per year. Major crops—cereals, pulses, and root crops—saw annual growth rates of 4.5%, 3.3%, and 5.4%, respectively. Fruits, chat, and coffee also experienced significant growth, with annual increases of 19%, 9.5%, and 6.2%, respectively (EPDC 2020; CSA 2021). This productivity boost is attributed to improved agricultural input distribution, better extension services, and increased availability of productivity-enhancing technologies (EPDC 2020).

Agricultural productivity is typically assessed by examining crop yield per unit of cultivated land. Changes in productivity directly impact farmers' income, employment rates, food self-sufficiency,

[3] https://www.elibrary.imf.org/view/journals/002/2020/029/article-A001-en.xml?result=2&rskey=GtJQW4
[4] *Agricultural Led Industrialization (ADLI) adopted in 1994*
[5] *Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005 - 2010)*
[6] *Growth and Transformation Plan I (2010 – 2014) and II (2015 – 2019) were five years strategic plans of Ethiopia*

food prices, and the supply of raw materials for both agriculture and manufacturing. According to the CSA's multi-year agricultural sample survey, productivity of key grain (such as Teff, Barley, wheat, and maize), vegetables (such as cabbage, tomatoes) and fruit (like avocado, guava, pineapple) crops saw modest improvement in the country between 2016/17 and 2020/21(CSA 2021; 2020; 2019; 2018b; 2017a). However, there was stagnation or decline in the productivity of root crops (like onion, potatoes, garlic), chat, and coffee during the same period.

Ethiopia is one of the countries with the largest livestock populations in the world, ranking 1st in Africa and 6th globally in total livestock. The country also ranks 3rd in Africa and 10th globally for sheep, and 3rd in Africa and 8th worldwide for goats (FAOSTAT, 2017 ; ELIDI, 2015). According to (CSA, 2009/10, 2017/18, 2020/21), from 2009/10, 2017/18, and 2020/21, Ethiopia's livestock population includes 70 million cattle, 43 million sheep, and 52 million goats with the Oromia region leading in livestock numbers.

Ethiopia holds immense agricultural potential due to its diverse and favorable agro-ecological conditions. The country is well-suited for irrigation, crop cultivation, and livestock development. Its varied climate and ecological zones support the growth of a wide range of crops, including cereals, pulses, oilseeds, fruits, vegetables, and cash crops like coffee and chat, with significant room for expanding both production and productivity. Increased agricultural productivity directly impacts the agro-processing and packaging industries by providing a steady supply of raw materials, which boosts the development of value-added products. As production increases, the agro-processing sector can scale up operations, creating opportunities for innovation in product packaging and expanding export markets. Ethiopia’s potential for large-scale commercial farming and animal husbandry further strengthens the prospects for agro-industrial growth, positioning the country as a key player in the global market for processed agricultural goods.

03.2: Agro-processing and Packaging Landscape in Ethiopia

03.2.1: Current State of Agro-processing Sector

Data from the Ethiopian Investment Commission (EIC) reveals that approximately 13,978 agro-processing industries were licensed between 1990 and 2024. Of these, the majority are in the pre-implementation stage (69%) and implementation stage (7%), while around 24% have become operational. These projects promised to create jobs for about 174,300 people, both temporarily and permanently. Reportedly, the licensed projects registered ETB 150 billion during this period, with a significant majority (96%) originating from domestic sources compared to foreign and public investments. Of the operational projects, domestically sourced investments dominate the landscape (92%). Manufacture of food products take the lion share (76%) from total operational domestic originated agro-processing projects. Similarly, about half (49%) of foreign agro processing investments engaged in manufacturing of food products.

Table 3: Agro processing investment projects in Ethiopia (1990 to 2024)

Investment Type	Division	Total No. of Projs	No. of Pre-Implementation projects	No. of Implementation projects	Operation			
					No of Projs	Capital in Billion ETB	Perm Empl.	Temp Empl.
Domestic	Manufacture of Beverages	731	623	41	67	4.62	4,623.4	883
	Manufacture of dairy products	434	339	17	78	1.00	1,001.1	3,571
	Manufacture of Food Products and Beverages	6	6					
	Manufacture of grain mill products, starches and starch products, and prepared animal feeds	2,140	1,775	110	255	2.81	2,806.8	5,067
	Manufacture of other food products	8,738	5,787	599	2,352	54.53	54,531.5	68,205
	Production, Processing and preservation of meat, fish, fruit, vegetables, oils and fats	1,313	866	114	333	11.19	11,194.1	10,166
Domestic Total		13,362	9,396	881	3,085	74.16	74.16	74,157.0
Foreign	Manufacture of Beverages	125	34	26	65	22.19	22,187.5	3,397
	Manufacture of dairy products	16	3	6	7	0.19	186.4	104
	Manufacture of grain mill products, starches and starch products, and prepared animal feeds	52	19	11	22	2.40	2,395.1	940
	Manufacture of other food products	292	85	73	134	7.88	7,878.1	8,984
	Production, Processing and preservation of meat, fish, fruit, vegetables, oils and fats	117	44	34	39	1.00	1,004.3	1,024
Foreign Total		602	185	150	267	33.65	33.65	33,651.3
Public	Manufacture of Beverages	2		1				

Investment Type	Division	Total No. of Projs	No. of Pre-Implementation projects	No. of Implementation projects	Operation			
					No of Projs	Capital in Billion ETB	Perm Empl.	Temp Empl.
	Manufacture of grain mill products, starches and starch products, and prepared animal feeds	1		1				
	Manufacture of other food products	11	2	1	42	42.11	42.11	414
Public Total		14	2	3	9	42.14	42.14	42.14
Grand Total		**13,978**	**9,583**	**1,034**	**3,361**	**149.95**	**149.95**	**149,952.9**

Source: Ethiopian Investment Commission, 2024.

Although the Amhara region takes the lead in terms of licenced projects (30.5%) followed by Addis Ababa (26%) and Oromia (20%), Addis Ababa by far excels when it comes to operationalizing the licensed investments (62%) during the considered 1990 to 2024 period. Oromia region and the former SNNPR (now broken into four independent regions – Sidama, South West, Central and South) comprise 16% and 12% of the entire operational agro-processing projects in the country respectively, next to Addis Ababa.

The agro-processing investment landscape has experienced significant changes over the past decade. According to the EIC, 9,388 investments have been registered since 2014, but only 16% (around 1,500) have become operational. Both the number of licensed and operational projects have notably declined in the past five years, with licensed projects decreasing by an average of 27% annually and operational projects dropping by 46% per year on average.

Table 4: Licensed investment projects by year and status

Year	Implementation	Operation	Pre-Implementation	Grand Total
2019	76	203	640	919
2020	104	106	1032	1242
2021	21	32	1052	1105
2022	17	5	1301	1323
2023	12	7	923	942
2024	2	2	116	120
Total	**555**	**1,493**	**7,340**	**9,388**

Source: EIC, 2024

A further disaggregation of the EIC data shows that coffee processing and production of bakery, pastry, biscuit & related food items accounted for a combined 58% of the entire operational agro-processing industries in the country, followed by edible oil processing (10.6%) and flour/grain mill factories (7%). Other sectors include dairy, bottled water, honey, pasta, baby food, fruit and vegetable processing, meat products, and animal feed. This concentration highlights limited diversification, suggesting a need for broader investment across underrepresented sectors to enhance the industry's growth and resilience

Table 5: Operational agro processing industries by category

Category	Number	Percent
Bakery, pastry, biscuit & related	954	28.4%
Milk and dairy products processing	122	3.6%
Alcohol & beverages manufacturing	89	2.6%
Bottled water	55	1.6%
Bee products, honey processing & related	38	1.1%
Meat and meat products processing	62	1.8%
Coffee, hauling, processing & related	985	29.3%
Edible oil processing & related	357	10.6%
Flour milling/ factory, and related	241	7.2%
Macaroni, pasta and noodles products	81	2.4%
Baby food processing Factory	88	2.6%
Fruit & vegetable processing	115	3.4%
Animal Feed Processing	24	0.7%
Other foods and agro processing manufacturing	150	4.5%
Total	**3,361**	**100%**

Source: EIC, 2024

According to CSA (2018), 47% of Ethiopia's large and medium-scale manufacturing industries are agro-processing, representing 1,712 out of 3,623 establishments. The food and beverage sector leads at 55.3%, reflecting Ethiopia's emphasis on food production. The textile industry follows with 16.9%, and leather processing, including footwear, contributes 9.3%. Wood products and paper manufacturing account for 4.4% and 8.0%, respectively. The majority of these agro-processing industries are privately owned, aligning with global trends in developing economies.

The CSA (2017) report on small-scale manufacturing industries in Ethiopia depicts that the sector is dominated by the manufacture of grain mill services, which accounts for 48% of the total establishments (41,975 out of 87,434). This is reflective of Ethiopia's reliance on cereal-based agriculture, particularly teff, maize, and wheat. The manufacture of wearing apparel, dressing, and dying of fur forms the second-largest category, with 28.7% of establishments (25,100). This indicates a growing emphasis on garment production, which aligns with global trends but remains largely domestic-focused.

Table 6: Small Scale Agro-processing manufacturing industries in Ethiopia

Industrial Group	Establishments	
	No. of establishments	Percent
Manufacture of food products except grain mill services	**17,061**	**19.5 %**
Production, processing and preserving of meat and meat products	183	0.2%
Manufacture of vegetable and animal oils and fats	733	0.8%
Manufacture of bakery products	12,422	14.2 %
Manufacture of other food product n.e.c	3,708	4.2%
Others	14	0.0%
Manufacture of grain mill services	**41,975**	**48.0 %**
Manufacture of textiles	**1,414**	1.6%
Preparation and spinning of textile fibers; weaving of textiles	693	0.8%
Manufacture of made-up textile articles, except apparel	721	0.8%
Manufacture of wearing apparel; dressing and dying of fur	**25,100**	**28.7 %**
Manufacture of luggage, handbags and footwear	**483**	**0.6%**
Manufacture of luggage, handbags and the like, saddlery and harness	174	0.2%
Manufacture of footwear	242	0.3%
Others	67	0.1%
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of strew and plaiting materials	**1,401**	**1.6%**
Sawmilling and planing of wood	1,363	1.6%
Manufacture of builders' carpentry and joinery	25	0.0%
Manufacture of wooden containers	13	0.0%
Total	**87,434**	**100.0 %**

Source: CSA (2017)

As per CSA (2017), the manufacture of food products, excluding grain mill services, constitutes 19.5% of establishments. Within this, the bakery products segment is particularly significant, accounting for 14.2% of the total, highlighting the demand for staple foods like bread. However, other sub-sectors such as meat processing (0.2%) and edible oils (0.8%) are underrepresented, despite Ethiopia's agricultural potential. Meanwhile, the textile industry, comprising 1.6% of total establishments, is largely undeveloped, despite Ethiopia's potential as a low-cost production hub. The even split between spinning textile fibers and made-up textile articles (each 0.8%) reflects a

need for increased investment and scaling, similar to successful models in Vietnam[7] (Nhung and Thuy 2018; Le, Tran, and Nguyen Duc 2019) and Bangladesh (Golam 2006; Rasel, Das, and Khan 2020), where strategic government policies helped these nations integrate into global supply chains. The wood processing industry, representing 1.6% of the total, remains focused on sawmilling rather than higher-value products like furniture, despite the country's potential for timber resources.

Another data set from the Ethiopian Ministry of Trade and Regional Integration (MoTRI) indicates there are approximately 26,000 agro-processing businesses in the country. The majority are concentrated in Oromia region (7,415 establishments, 28.6%), Amhara region (6,252 establishments, 24%), and Addis Ababa city (5,926 establishments, 23%), with Tigray region accounting for 13%. Together, these regions make up 91.3% of Ethiopia's agro-processing capacity, with Addis Ababa serving as the industrial hub and Oromia and Amhara as key agricultural regions.

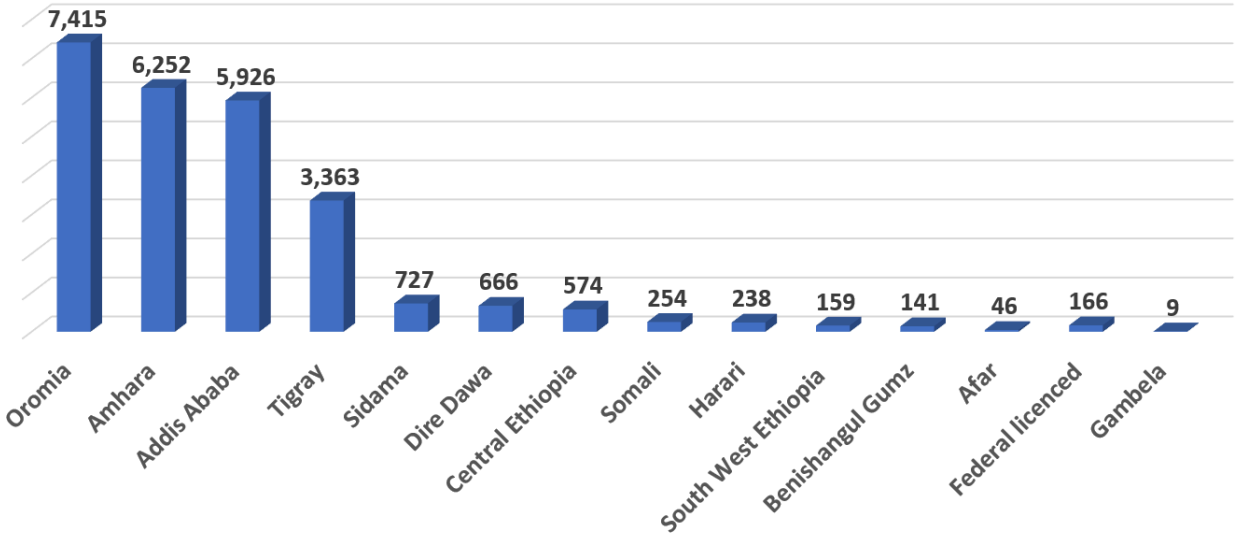

Figure 6: Number of agro-processing licensed businesses in the country by region

Source: MoTRI, 2024

This concentration is not uncommon in developing economies, where industrial growth is often centered around capital cities or agriculturally rich regions. For instance, similar patterns can be observed in Kenya, where Nairobi serves as a commercial hub, and agricultural processing is concentrated in the central highlands[8] (KNBS 2024). This pattern is a function of access to raw materials, infrastructure, and markets. In Ethiopia, this clustering suggests that infrastructure, market access, and government policies are not yet evenly distributed across the country.

7 https://arc-group.com/vietnam-supply-chain/#:~:text=in%2DVietnam%E2%80%9D.-,Vietnam's%20Role%20in%20the%20Global%20Supply%20Chain,sourcing%20market%2C%20especially%20in%20Asia.

8 https://news.africa-business.com/post/kenya-the-business-hub-of-east-africa

The disparities in regional development align with patterns observed in countries like Vietnam and India, where industrial hubs tend to develop in specific regions, leaving others relatively underserved. Vietnam has tackled this issue through targeted investment in rural areas and tax incentives to encourage industries to establish operations outside the major cities. India, through its special economic zones (SEZs) and infrastructure improvements, has also attempted to address regional disparities, though challenges remain[9] (Seshadri and Storr 2010; Aggarwal 2007; Van Long 2013; Nozaki 2014).

Bakery products manufacturing (55.4%), Grinding/manufacturing of grains input/ or products (17.7%), manufacture of coffee and tea (5%), and edible oil production (4) dominate the agro-products processing landscape in the country with a combined share of 82%. As mentioned, the largest sector across all regions is the manufacturing of bakery products, which dominates in Oromia (3,507 establishments), Amhara (3,645), and Addis Ababa (2,581). The prominence of bakery processing highlights the demand for bread and other baked goods, which are staple food items across the country.

Table 7: Number of agro-processing licensed businesses in the Ethiopia

	Category						
Oromia	928	3507	648	474	673	1,185	**7,415**
Amhara	1578	3645	126	348	43	512	**6,252**
Addis Ababa	1564	2581	325	146	38	1,272	**5,926**
Tigray	154	2845	76	32	21	235	**3,363**
Sidama	103	432	28	7	32	125	**727**
Dire Dawa	51	439	32	13	8	123	**666**
Central Ethiopia	125	372	9	7	6	55	**574**
Somali	19	152	4	5	19	55	**254**
Harari	15	209	0	1	4	9	**238**
SW Ethiopia	27	63	27	0	3	39	**159**
Benishangul Gumz	10	103	0	2	22	4	**141**
Afar	3	14	0	0	0	29	**46**
Federal licenced	20	9	10	20	13	94	**166**
Gambela	3	4	0	0	0	2	**9**
Total	**4,600**	**14,375**	**1,285**	**1,055**	**882**	**3,739**	**25,936**

Source: MoTRI, 2024

According to MoTRI (2024), it can be seen that the grinding and manufacturing of grains is another important sector, especially in Amhara (1,578) and Addis Ababa (1,564). Grain milling is a critical component of Ethiopia's food production system, given that grains, particularly teff, maize, and wheat, are the staple crops of the Ethiopian diet. The meat processing and edible oil manufacturing

9 https://vietnamlawmagazine.vn/vietnams-agricultural-and-rural-development-policies-center-on-farmers-welfare-4884.html

are notably underrepresented compared to bakery and grain processing. For instance, Oromia, despite being the largest region for livestock production, has only 673 meat processing establishments, and Amhara has just 43. Similarly, edible oil production establishments are also relatively sparse, with only 474 in Oromia and 348 in Amhara. This suggests a significant untapped potential in these sectors, especially considering Ethiopia's large livestock population and high domestic demand for edible oils. Ethiopia's edible oil and meat processing industries appear underdeveloped in comparison to other African countries like Malysia (Mohd Hanafiah et al. 2022) and Tanzania[10] where they have a much more advanced industry, supported by well-established infrastructure and export markets which Ethiopia could benefit from adopting similar strategies to boost these sectors.

In sum, Ethiopia's agro-processing sector highlights both significant achievements and notable gaps. It is heavily focused on food-related products such as coffee, bakery goods, and grain processing. As clearly elucidated in the preceding paragraphs, varying reports from different sources (EIC, CSA, MoTRI) reveal inconsistencies in the data on the number and distribution of agro-processing businesses, pointing to a need for better coordination and reporting across the sector. The industry is largely concentrated in Addis Ababa and Oromia, with significant potential for growth in underdeveloped areas and other sectors like textiles and leather. Expanding the industry beyond its current regional and sectoral focus could boost competitiveness and contribute more broadly to the country's economy. Drawing lessons from other countries, Ethiopia can upscale its agro- processing sector by fostering innovation, improving infrastructure, and providing targeted support to both large as well as small and medium-sized enterprises (SMEs). Expanding and diversifying these industries will be key to driving sustainable economic growth and creating a more balanced agro-processing sector.

03.1.2: An Overview of the Packaging Industry

i. General perspective

Data from the EIC depicts that about 267 packaging investment projects registered in the country between 1996 and 2023, with about half (51%) turned operational, 38% in pre-implementation stages and 11% in implementation phases. The majority (79%) are domestic projects, 20% are foreign direct investments (FDIs), and only 1% is publicly initiated. Addis Ababa emerged as the leading destination, attracting 77% of the licensed projects, with 97% of the operational domestic projects located there. FDIs are primarily concentrated in the Oromia region notably around Addis Ababa (63%) and Addis Ababa city (30%). These patterns highlight the concentration of packaging investments in urban areas, particularly Addis Ababa, which could foster innovation and accessibility in the sector. However, the heavy reliance on domestic initiatives and the limited public investment suggest a potential gap in support for scaling operations and improving infrastructure to enhance the competitiveness of Ethiopia's packaging industry and support its growth in both local and international markets.

[10] https://sdgprivatefinance.undp.org/leveraging-capital/sdg-investor-platform/edible-oil-production

Table 8: Packaging investment projects in Ethiopia (1996 to 2023)

Investment Type	Division	Total No of Projs	No of Pre-Implementation Projs	No of Implementation Projs	Operation			
					No of Projs	Capital in Million Birr	Perm Empl.	Temp Empl.
Domestic	Manufacture of Paper and Paper Products	166	70	20	76	1,295.48	571	1,694
	Manufacture of plastic products	52	23	2	27	1,021.15	349	340
	Printing and service activities related to printing	8	3		5	35.53	63	0
	Domestic Total	**226**	**96**	**22**	108	2,352.16	983	2,034
Foreign	Manufacture of Paper and Paper Products	29	6	4	19	1,257.16	1,356	515
	Manufacture of plastic products	11		3	8	171.13	267	246
	Foreign Total	**40**	**6**	**7**	**27**	1,428.30	1,623	761
Public	Manufacture of Paper and Paper Products	1			1	20.39	91	10
	Public Total	**1**			**1**	20.39	**91**	10
	Grand Total	**267**	**102**	**29**	**136**	3,800.84	2,697	2,805

Source: EIC, 2024

Zooming into the recent trend, the analysis of annual growth patterns in operational investments in Ethiopia's packaging sector from 2014 to 2023 shows a concentration of such investments in a few key regions, with notable disparities across the country. Among all regions, Addis Ababa, Oromia, and Tigray are the only ones with operational investments, indicating a clear divide in the development stages of the packaging sector across Ethiopia.

Addis Ababa exhibits the highest level of operational activity, with significant peaks observed in 2015 where 20 projects reached the operational stage. Concentration of operational investments in the capital suggests that Addis Ababa remains the primary hub for packaging activities, benefiting from strong infrastructure, proximity to markets, and a favorable business environment. However, a consistent drop-off in operational investments from year to year since 2015 suggests difficulties in sustaining investment momentum, making Addis Ababa and other regions of the country deterred from turning registered investments operationalized due challenges emanated from such as political instability, financial constraints, infrastructure constraints and external factors.

Oromia also shows notable activity, though at a lower scale than Addis Ababa. The region has had about 10 operational investments since 2014, with a peak of 3 in 2017. This peak suggests relative acceleration in market development, possibly driven by improved infrastructure, regional incentives, or growing demand for packaging services. The general pattern overall suggests a slow start to the decade but a gradual build-up in activity thereafter. The pattern in Oromia suggests steady but slower growth compared to Addis Ababa, with signs of increasing momentum in recent years.

Tigray presents a contrasting picture with the fewest operational investments overall. The region had only one project commenced operation in 2019 with no other new operational investments in the entire decade. Regions like Amhara and Dire Dawa do not have any operational investments; Amhara's investments are solely at the pre-implementation and implementation stages, while Dire Dawa has only pre-implementation projects. This indicates that both regions are still in the early stages of developing their packaging sectors. The absence of operational projects in Amhara, despite having a substantial number of pre-implementation and implementation projects, suggests that while there is investment interest, projects are either delayed in reaching completion or face barriers to becoming operational. Similarly, Dire Dawa's focus on pre-implementation projects reflects nascent interest but also underscores the lack of progression to later stages of development.

At the national level, the data reveals a concentration of operational investments in Addis Ababa and Oromia, with Tigray trailing significantly. Key insights from this analysis suggest that while Addis Ababa and Oromia are leading the sector, there is a need to diversify investments across other regions to balance development. These may encompass efforts requiring focus on overcoming barriers that prevent projects from moving beyond the pre-implementation and implementation stages. Enhancing infrastructure, addressing political challenges, improving the business environment, and offering targeted incentives, for instance, could encourage revitalizing investment interest and faster progression to the operational stage.

ii. Investment landscape pattern

Between 2014 and 2023, the operational packaging investments in Ethiopia showed varied trends and patterns, with a clear preference for certain types of packaging over others. According to EIC, there were 95 total investments during this period, primarily concentrated in the '*Manufacture of paper packages'* category, which accounted for 71 investments (around 75% of the total).

Table 9: Operational packaging investments in Ethiopia

Year	Printing & packages	Manufacture of paper packages	Manufacture of Plastic package	Manufacturing of cartoon packages	PP woven bag & flexible packaging	Grand Total
2014		10	1			11
2015		17	3	1		21
2016	1	7	7			15
2017	2	11	4			17
2018		12				12
2019	1	10			1	12
2020		2	2			4
2021	1	1				2
2022		1				1
Total	**5**	**71**	**17**	**1**	**1**	**95**
Percent	5%	75%	18%	1%	1%	100%

Source: EIC, 2024

The investment landscape can be divided into three distinct phases. The period from 2014 to 2016 saw initial growth, with investments peaking at 21 in 2015 and diversifying to include 'manufacture of plastic packages. However, there was a drop to 15 investments in 2016, despite a noticeable increase in interest in plastic packaging. The years 2017 to 2019 marked a peak and subsequent fluctuation, with the highest investment count of 17 in 2017, driven by growth in both 'manufacture of paper packages' and 'manufacture of plastic packages.' Afterward, investments began to decline, reaching 12 in 2019. The period from 2020 to 2023 saw a sharp downturn in activity, with only 4 investments in 2020 and just 1 by 2022, indicating a significant slowdown in the sector.

The analysis reveals that while 'manufacture of paper packages' remained a consistent performer throughout most of the period, the sector experienced a sharp decline in investments after 2019, possibly due to combinations of economic challenges, market demand shifts, political instability, and the impact of global disruptions such as the COVID-19 pandemic. Meanwhile, 'manufacture of plastic packages' showed potential for growth in the early years but saw reduced activity in later years. Categories like 'printing and packages', 'manufacturing of cartoon packages', and 'PP woven bag & flexible packaging' received minimal investments, highlighting limited market interest or demand. These underrepresented categories could benefit from diversification which could reduce reliance on paper packaging and offer alternative solutions. Renewed interest in plastic packaging may also be possible under the right market conditions, especially for industries that require durable packaging options.

On the other hand, the MoTRI (2024) data shows presence of about 669 licensed paper and paper products packaging establishment businesses in Ethiopia spread across various regional states. Addis Ababa, the capital, leads with 399 establishments, making up about 60% of the total, reflecting its role as the country's commercial and industrial hub with access to infrastructure, markets, financial services, and skilled labor. Oromia follows with 128 establishments, around 19%

of the total, benefiting from its proximity to Addis Ababa and a large local market. Regions like Amhara (30 establishments) and Tigray (27 establishments) contribute modestly to the total, representing about 4-5% each, reflecting their developing paper packaging sectors. Other regions such as Sidama (23 establishments) and Dire Dawa (17 establishments) show emerging markets for packaging businesses, likely driven by strategic locations and access to trade routes. However, areas like Somali (8 establishments), Harari (1 establishment), and Central Ethiopia (4 establishments) have very few establishments, indicating minimal paper packaging industrial activity in these regions perhaps due to challenges such as lower levels of industrialization, smaller markets, and inadequate infrastructure.

The heavy concentration of packaging establishments in Addis Ababa and Oromia aligns with global trends where packaging industries cluster around major cities or economic hubs due to better market access, transportation, and logistics. In contrast, the minimal presence in regions like Somali and Harari suggests a lack of development in these areas, potentially due to limited investment, market size, or infrastructure. Experiences from other countries, such as Spain (Catalonia packaging cluster[11]), India, South Africa and Vietnam, show that government incentives and infrastructure development can encourage the growth of packaging industries in secondary cities and less developed regions (Howard, Thijssen, and Jacco 2013; Fisher and Reuber 2000).

In conclusion, Ethiopia's packaging sector shows strong growth potential, especially if investments are encouraged, sustainability is promoted, and capacity-building efforts are intensified. Learning from international best practices and implementing targeted policies can help Ethiopia achieve balanced regional development and further expand its packaging industry.

03.3: Marketing Trends and Dynamics of Product Packaging

03.3.1: Global Agricultural Packaging Market Overview

The global agriculture packaging market was valued at USD 6.47 Billion in 2022 and is expected to grow at a cumulative annual growth rate (CAGR) of 5.3% from 2023 to 2033 and is projected to reach USD 11.45 billion By 2033 (Future Market Insights 2024). This growth is driven by the increasing demand for efficiency in supply chains to reduce food waste, as well as the growing need for superior protection of agricultural products during storage and transportation. According to Future Market Insights (2024), the global agricultural packaging industry will have the ensuing features in the coming years.

- The global agricultural product market faces challenges such as high costs of raw materials and concerns over recyclability of packaging materials.
- Regional leaders: North America held 22.8% of the agricultural packaging market in 2022, with the United States alone accounting for 20.8%. The region is expected to grow at a CAGR of 5.2%. China is a key player in the Asia Pacific region, with an anticipated growth rate of 6.7%.

[11] https://www.clustercollaboration.eu/content/introducing-packaging-cluster-future-packaging-here

- Product type: bags/bins led the product market with a 42% share in 2022 and are projected to grow at a CAGR of 6.2%. The silage segment represented 44.6% of the market and is expected to grow at a CAGR of 6.1%.
- Key players: major companies like Bemis, Sonoco, Mondi Group, and others are investing in innovative packaging, with common strategies including mergers and partnerships to expand their reach.
- Start-ups like Westrock, Ecovative, and Good Start Packaging are contributing by offering sustainable, technology-driven solutions.

As per (Verified Market Research 2023; Future Market Insights 2024), key global market drivers of agricultural packaging encompass:

- Growing global population and food demand
- Food safety and quality assurance – with consumers are increasingly demanding safe and high-quality food products, which has led to an emphasis on protective packaging
- Growing demand for agrochemicals such as fertilizers and pesticides, which require advanced packaging materials,
- Sustainability issues and legislation- growing environmental concerns and government regulations are driving the demand for sustainable and eco-friendly packaging materials.
- Rising use of bulk bags for local and international transportation of agricultural products
- Demand for specialized packaging driven by the needs of different agricultural products for specific packaging requirements based on their characteristics and handling desires
- Improved supply chain efficiency - good packaging helps make transporting and storing agricultural products easier, reducing waste and making the entire supply chain more efficient.

Notably, the global agricultural packaging market is expected to see continued growth, driven by sustainability demands, stricter regulations, and the need for innovative solutions to enhance food safety and supply chain efficiency. As North America and China lead this shift, companies will likely invest more in eco-friendly materials and technology-driven packaging to meet consumer expectations and regulatory pressures. The focus on specialized packaging for agrochemicals and diverse agricultural products will also expand, shaping a future where recyclability and environmental impact are central to packaging strategies.

Overall, the global agriculture packaging market is expected to grow significantly in the coming years ahead mainly due to a rising population, greater focus on food safety, and the growing need for packaging that is both sustainable and efficient. As more people need food, packaging solutions that protect products, reduce waste, and are environmentally friendly will become even more important.

03.3.2: Trends and Dynamics of Ethiopia’s product packaging

According to Manufactuing Africa (2022), Ethiopia's packaging materials consumption reached an estimated USD 648 million, with an annual growth rate of approximately 8%. Of this amount, USD 438 million (68%) is potentially serviceable by local manufacturers, excluding pre-packaged

imports. As per the source, the country has a total of 59 packaging companies[12] each with average revenues below USD 4 million and contribute to the production of USD 174 million in domestically manufactured packaging materials. These facts imply the packaging industry in Ethiopia has a significant potential for local growth, with opportunities for expansion and increased market share by domestic manufacturers. The industry's steady growth presents a promising landscape for investment, innovation, and scaling up operations to meet rising demand.

Table 10: Ethiopian packaging production and consumption (2019)

Component	Description	USD (million)	Percent
Local production	Packaging produced in Ethiopia	174	27%
Addressable imports	Ready-made packaging imported to package locally produced goods	264	41%
Non addressable imports	Packaging of imported products that have been packaged before importing; volumes can decrease / be addressed as local production of goods increases	210	32%
Total	Total	648	100%

Source: Manufacturing Africa (2022)

The agro-processing sector is found to be the biggest consumer of packaging products in the country. This dominance has both challenges and opportunities. Analysis from the Manufactuing Africa (2022) report depicts the food and beverage sector dominating the local packaging market with a staggering 58% of sales (food 32%, drinks 26%), while plastics account for 56% of the total substrate. Putting it differently, it means that local manufacturers in the country are only able to produce about 27% of the total packaging needed. Most of this production is focused on the food and drinks industry, which makes up 58% of the packaging created locally, and more than half of the packaging materials (56%) used by these local producers are made from plastic.

As per the report, Ethiopia could meet only 41% of its addressable packaging needs through local production in contrast to the average African economy, which locally produces 60% of its packaging materials, showing a critical gap for local manufacturers to fill. The country remains highly dependent on imports for plastics, paper, and metal, though it relies less on glass imports which underscores the need for investment in domestic production to reduce dependency and foster industry growth. The insights from the report highlight significant investment opportunities across the packaging value chain in the country, particularly in raw material manufacturing and

[12] *It was mentioned in this paper that different sources including the EIC, CSA, and MoTRI provide varying figures, necessitating common agreeable number at national level.*

conversion, with notable gaps in pulp production, paperboard, liquid cartons, rigid plastics like preform bottles, and flexible plastics.

Ethiopia's packaging sector faces several challenges, including low competitiveness and small-scale operations, costly and difficult raw material imports, stringent regulatory conditions, and an overall low ease of doing business. The packaging companies, including those targeting agro-processed products, struggle with high costs due to logistics and reliance on intermediaries, low product quality from inferior materials and outdated technology, poor after-sales service, and limited product variety with few customization options (Manufacturing Africa 2022). Businesses in packaging industry in Ethiopia are further constrained with complex and time-consuming startup procedures, unreliable electricity supply and difficulties in converting licensed investments into fully operational businesses due to bureaucratic hurdles and inefficiencies. These challenges were consistently echoed by the packaging firms interviewed, highlighting common concerns across the industry that hinder business growth and operational efficiency in the sector.

Box 4: Key Facts and Market trends of the Ethiopian Packaging Sector

- Local production meets only about 27% of the country's demand which focused mainly on the food/drinks sector (58%) with its main substrate being plastics (56%).
- Almost all packaging manufacturing takes place in the vicinity of Addis Ababa and proximal to industrial parks.
- Ethiopian companies rely on imported packaging materials (notably plastic, metal, and paper packaging) for about 60% of addressable domestic demand.
    - Plasitc: *Carboys, bottles, flasks; Sacks and bags excluding those of polymers of ethylene; Articles for the conveyance or packaging of goods, of plastics*
    - Metal: *Crown corks of base metal; Stoppers, caps and lids; Cans of iron steel*
    - Paper: *Cartons of corrugated paper; Folding cartons of non-corrugated paper*
    - Glass: *Carboys, bottles, flasks, jars, pots, phials and other containers, of glass, of a kind used*
- There is a higher concentration of players in the packaging manufacturing part of the value chain, with a significant gap of raw material producers.
- Raw product manufacturers, when present, are forward integrated. Key collection and recycling organizations in this space including material for 60 -70% of domestic demand.

- Growth of the packaging sector will be driven by growth in food and beverage sector, and other priority sectors also depend on locally produced packaging for growth.
- Ethiopia's packaging consumption is projected to double by 2030, expanding into a market worth approximately USD 1.3 billion, with 60-80% of this market being addressable by local manufacturers. The consumption of plastics, both rigid and flexible, is anticipated to grow, particularly in the food and beverage sectors. By 2030, the addressable market for local manufacturers could reach between USD 800 million and USD 1.05 billion, suggesting a potential fourfold increase in local production over the coming years if opportunities for import substitution are effectively leveraged.

Source: Excerpted from Manufactuing Africa (2022)

Several factors determine the market trends and demand for packaging of agricultural products in Ethiopia. These range from expansion of agricultural products to consumers' claim and perspectives; from the level of export market growth to the extent of e-commerce expansion locally; from level of urbanization to the extent of technological embeddedness in packaging etc that create niches in each category as elaborated hereunder from Ethiopia's context.

- **Growing agriculture and agro-processing sector**: as mentioned before, various factors are fueling the agro-processing sector with the agriculture sector growth witnessed in the country which apparently encourages the value addition of agricultural products, particularly targeting high-value crops such as coffee, oilseeds, cereals, pulses, horticulture and livestock products. Apparently, bulk packaging solutions are becoming essential aligned with agricultural production scaling up to meet demands. This includes large bags or containers designed for efficient transport of grains or pulses which ultimately expands the demand for innovative and diversified packaging solutions tailored to various product categories. As a business opportunity, young entrepreneurs can focus on creating cost-effective bulk packaging options that reduce waste while ensuring product integrity during transit. Niches in this area may encompass entrepreneurs involving in the design and production of eco-friendly bulk sacks or containers for grains, pulses, and oilseeds, or developing moisture-resistant bags for coffee beans.

- **Demand for cold chain packaging**: Ethiopia's underdeveloped cold chain logistics have been leading to significant post-harvest losses particularly in dairy, meat, fruits and vegetables, flowers and similar other perishable agricultural products (Kaur and Watson 2024; Urugo et al. 2024). In this regard, there is a demand for packaging solutions designed to maintain the freshness and quality of perishable goods for which young entrepreneurs, for instance, can capitalize on this gap by creating insulated and temperature-regulated packaging materials, enabling efficient transport and storage. As market niches, for instance, **e**ntrepreneurs can

develop and manufacture insulated boxes (for example vacuum-sealed bags for meat and dairy), temperature-regulated packaging (such as moisture-resistant crates), and eco-friendly cool bags and similar others that would help maintain the freshness and quality of perishable goods during transportation and storage.

- **Export market and compliance with international standards**: Ethiopia's exports are primarily dominated by a small range of agricultural products, with minimal value addition (NBE 2024; BELAY 2020). To improve the situation, Ethiopia aims in its ten years perspective plan (2020/21-2029/30) to increase export of agricultural output and substituting imports (NPC 2020). The Plan has specifically targeted broadening the export base and creating value additions to export commodities to improve the competitiveness of the economy in the regional and global value chains. Further, producing adequate quantities of exportable agricultural products that add value is among the main objectives of the agricultural development aim in the perspective plan. As per the PDC (2020), there is a target to increase merchandise export revenues from USD 3.0 billion to USD 18.3 billion by raising USD 6.7 billion from agriculture, USD 9 billion from manufacturing, USD 2.1 billion from mining, and USD 0.7 billion from electricity and other commodities in the perspective plan period. In other words, Ethiopia is increasingly targeting international markets for its agricultural and agro-processed products such as coffee, oilseeds, honey and livestock. International markets, particularly in Europe and the Middle East, demand packaging that meets stringent quality and safety standards (e.g., labeling, traceability, eco-friendliness). To access these markets, local companies must adopt global packaging trends like vacuum packaging, tamper-evident seals, and sustainable materials. In terms of niches in the category, entrepreneurs can develop packaging solutions like vacuum-sealed packaging to maintain product freshness, tamper-evident seals for security, and eco-friendly materials that appeal to environmentally conscious consumers. Incorporating traceability features, such as QR (Quick Response) code, would also help meet international requirements and hence enhances the competitiveness of Ethiopian products abroad.

- **Growing demand for sustainable packaging**: this is linked with the rising global awareness of environmental issues resulting in an increasing demand for sustainable packaging solutions. Sustainable packaging options are gaining traction, especially with global trends pushing for recyclable and compostable packaging materials (Rodriguez 2024; Prabaharan 2023). Ethiopia and other African countries are recently experiencing a growing concern over plastic pollution (Aragaw 2021; EPA 2024). As per EPA (2024), citing Euro-map 2022, Ethiopia's per capita plastic consumption rose from 0.6kg in 2007 to 2.6kg in 2021, making it the second-largest plastic importer in East and Central Africa, with 51% of imports used for packaging. The report underlines that plastic waste poses a major environmental threat to the country and elsewhere, contributing to pollution through improper disposal methods like littering, blocked drainage systems, and contamination of water sources. Relatedly, the shift towards biodegradable and recyclable materials brings a significant opportunity for young entrepreneurs to innovate in packaging design. As marketing niche, young entrepreneurs can focus on creating packaging options for agro-processed products that align with the country's environmental goals, including the aim to reduce plastic waste. Sustainable packaging solutions include plant-based bioplastics, recycled paper and cardboard, edible packaging, and bagasse (sugarcane fiber)

packaging. Ethiopia's abundant agricultural waste, such as coffee husks, teff straw, and sugarcane bagasse, could be converted into biodegradable (compostable/recyclable) packaging material, making them environmentally friendly alternatives to conventional materials.

- **Increasing consumer awareness**: Ethiopian consumers, especially the urbanities, are becoming more aware about product quality, convenience, safety, and sustainability (Wolde 2022; Kedir 2019). Urbanization in Ethiopia has been forecasted to grow at 5 percent per annum with the level of urbanization to reach 40 percent by the year 2035 (Ministry of Urban Development and Housing [MUDH] Ethiopia 2016). Urbanization and the shift toward modern retail are substantially fueling demand for packaged goods with supermarkets and retail chains growing in urban areas. Coupled with rising urbanities in the country, there is an observable shift towards consuming more processed foods, such as snacks, beverages, and ready-to-eat meals specially in larger towns and cities like Addis Ababa, Dire Dawa, Bahir Dar, Hawassa, Adama and others. This is creating a demand for a variety of packaging formats, including flexible pouches, cartons, and bottles. Interviews conducted with urban processed food consumers in Addis Ababa further highlight the growing demand for packaged products, driven by lifestyle changes and the convenience such products offer in fast-paced urban environments. The niches in the category where young entrepreneurs may engage encompass in the design and production of flexible pouches, resealable beverage bottles, eco-friendly cartons, vacuum-sealed packaging, convenient single-serving packs, glass jars and bottles, and ready-to-eat meal trays with each offer unique benefits.

- **Demand driven technology integration**: The integration of smart technologies into packaging, such as temperature-sensitive materials and RFID (Radio Frequency Identification) tags that help monitor product conditions throughout the supply chain, is becoming increasingly prevalent now a days (Schaefer and Cheung 2018; Ghaani et al. 2016; Ahmed et al. 2018). For instance, in response to the demands for food safety, quality, and longer shelf life in particular, packaging technologies like Modified Atmosphere Packaging (MAP), aseptic and smart packaging solutions, as well as packaging automation are becoming popular (Ghaani et al. 2016; Ahmed et al. 2018). These are also now slowly entering the Ethiopian market. In this connection, young entrepreneurs in Ethiopia, in collaboration with technology companies and financiers, can explore niches in smart packaging technologies by offering temperature-sensitive packaging for perishables, RFID-enabled tags for tracking pharmaceuticals, Modified Atmosphere Packaging (MAP) for extending shelf life of snacks, aseptic packaging for juices and sauces, smart packaging with real-time condition monitoring, and automated packaging systems to enhance efficiency for SMEs.

- **Investment trends**: as mentioned earlier in this paper, local and foreign investors are increasingly showing interests and actually investing in the Ethiopian packaging industry. This creates business opportunities for young entrepreneurs looking to provide specialized packaging services and facilitates knowledge transfer in the area helping local businesses upgrade to international packaging standards in the country.

- **Rising demand for specialized and customized packaging**: The demand for specialized packaging rises aligned with the growth of specific agro-processing sub-sectors such as the processing of dairy, meat, fruit and vegetables, and beverages (Persson and Bodiroga 2023; Poma, Al Shawwa, and Vesentini 2022). For example, dairy packaging is specifically required to ensure product freshness; beverage packaging manifests with tamper-proof features; and durable packaging is entailed for meat products. Similarly, Ethiopia's diverse agricultural output requires customized packaging solutions that cater to specific products. For instance, traditional products like injera or local spices may benefit from unique packaging designs that preserve freshness while appealing to local and international markets. Briefly, Ethiopian entrepreneurs can capitalize on the packaging industry investment by providing custom packaging for local products. Interview conducted with traditional food and spices processors in the country attest that several of the existing packaging solutions do not adequately address the needs of local producers and hence there is a market for entrepreneurs who can provide tailored solutions that enhance product presentation and shelf life. In this context, young Ethiopian entrepreneurs can provide tailored packaging solutions for the growing agro-processing sector. Examples include freshness-preserving packaging for dairy, durable vacuum-sealed options for meat, tamper-proof beverage packaging, resealable moisture-resistant designs for injera, and airtight, visually appealing packaging for spices and innovative solutions for traditional foods that enhance product shelf life and market appeal.

- **Emerging trends: the rise in E-Commerce**: the growth of e-commerce in Ethiopia is creating business opportunity for young entrepreneurs in agro-processed and other products packaging (Oláh et al. 2023). In fact, E-commerce in the country is still in its early stages but has grown significantly in recent years (Desalegn, Tangl, and Boros 2024). Platforms like *HellooMarket, Mercato Online,* and *Zmall* offer consumer goods, while start-ups such as *Deliver Addis* focus on food delivery, and *Chapa* provides online payment services (Mekonnen 2023). The sector remains underdeveloped compared to other countries, yet, it holds significant potential for growth. As online platforms similar to the above-mentioned ones (such as *ZMall* and *Deliver Addis*) expand, the demand for packaging that ensures the safety, durability, and aesthetic appeal of food products has shown increment as interviewees from multiple DFS providers witnessed. Packaging for agro-processed goods must protect items during shipping and preserve freshness and quality and in this regard, young entrepreneurs can capitalize on this niche by providing innovative, eco-friendly packaging solutions that cater to the needs of e-commerce platforms. Examples pertaining to this may encompass durable, resealable packaging for coffee, moisture-proof spice packaging, insulated meal kit packaging, tamper-proof packaging for snacks, biodegradable packaging for fresh produce, and customizable gift packaging for coffee and spice sets.

03.4: Value Chain Analysis of Agro-processing Product Packaging

The value chain for packaging agro-processed outputs in Ethiopia is an intricate, multi-layered system that plays a crucial role in transforming raw agricultural products into packaged goods ready for consumption or export. This chain involves various stages, each with its own set of

challenges and opportunities, from the production of raw materials to the delivery of finished products to the market. Drawing on international best practices and frameworks like the International Standard Industrial Classification (ISIC) of all Economic Activities, we can map this value chain in Ethiopia.

Insights from Manufactuing Africa (2022) show multiple actors playing varying roles across the packaging value chain of the country. These primarily cover raw product manufacturers, packaging manufacturers, packaging buyers, final users, collectors and recyclers. The study also identified opportunities across Ethiopia's packaging value chain, particularly in manufacturing of paper/plastic intermediate inputs and recycling. As per the report, the packaging manufacturing segment of the value chain features a large number of participants, while there is a notable shortage of raw material producers. When raw product manufacturers are involved, they typically engage in forward integration by also taking part in packaging production.

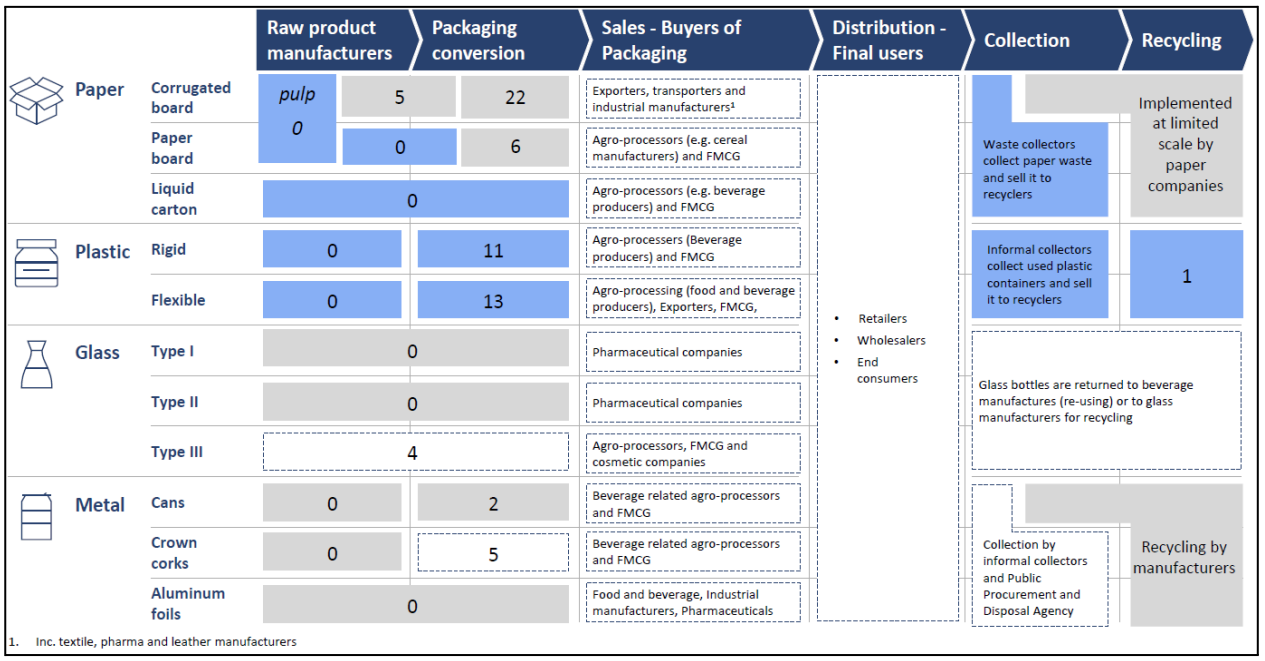

Figure 7: Local players in Ethiopia's packaging ecosystem

Source: Adopted from Manufactuing Africa (2022)

The value chain analysis for agro-processed product packaging in this study is framed into seven key stages. It begins with **agricultural production**, where raw materials are grown and harvested. Next is **collection and aggregation**, where these materials are gathered and sorted for further processing. **Primary processing** then prepares the raw materials for packaging, followed by **secondary processing and packaging**, where products are refined and packaged for market readiness. **Distribution** ensures that the packaged goods reach consumers efficiently, while **sustainability and innovations** in packaging focus on eco-friendly and cost-effective solutions. Finally, **opportunities for growth** highlight potential areas for expansion and improvement in the value chain. The figure below shows the mapping schematics of this entire process.

Figure 8: Value chain for packaging agro-processed outputs in Ethiopia

Source: Author's compilation

Details of each stage is elaborated hereunder.

i. Agricultural production

The value chain begins with agricultural production, the source of raw materials such as grains, fruits, vegetables, and livestock. Ethiopia is predominantly an agrarian economy, with over 75% of its labor force engaged in agriculture (CCA 2022). Despite issues such as low productivity, fragmented land holdings, and limited access to modern inputs (e.g., improved seeds, fertilizers) hinder efficiency, Ethiopia is one of Africa's largest producers of coffee, cereals, oilseeds, and pulses, making agricultural production the foundation for agro-processing industries (Bekabil 2014; Yigezu Wendimu 2021). The key players in agricultural production of the country encompass smallholder farmers, farmer cooperatives, and agribusinesses. The primary challenges in agricultural production of the country include climate variability, fragmented farm size, soil fertility problems, lack of modern agricultural practices, resource shortages, insufficient agricultural extension services and the like (Zerssa et al. 2021; Yigezu Wendimu 2021; Bekabil 2014).

ii. Collection and aggregation

Once raw agricultural products are harvested, the next step is collection and aggregation. Given that smallholder farmers dominate Ethiopia's agricultural landscape, collecting and aggregating products in larger volumes is essential to meet the requirements of processing plants. Aggregation typically happens at local markets, cooperatives, or intermediary collection centers. The major challenges hindering efficient collection and timely delivery to processing facilities inculcate infrastructure limitations, such as poor rural roads and limited transport facilities, and poor post-harvest handling, among others that leads to significant product loss, reducing the quantity and quality of raw materials available for processing (Bernard et al. 2010; Abraham et al. 2022).

iii. Primary processing

This stage prepares raw agricultural products for further refinement. It includes activities such as milling grains into flour, roasting coffee, oilseed crushing, processing of animal products or initial steps in the leather tanning process to ensure that agricultural products are in a condition suitable for further value addition through secondary processing. These activities transform raw agricultural goods into semi-processed inputs that can be packaged or used in other stages of food production (Logatcheva and van Galen 2015).

iv. Secondary processing and packaging

In the secondary processing phase, semi-processed raw materials are refined into final consumer products for which packaging becomes critical at this point (Logatcheva and van Galen 2015; Muthupandian, K., & Lakshminarayan 2017; Lakshmi and Purnima 2018). Proper packaging protects products, extends shelf life, and ensures that they meet both domestic and export standards. This stage importantly covers food, textile and leather

goods packaging activities. Packaged food products include items like flour, pasta, and beverages. Depending on the product type, different packaging materials—such as paper, plastic, glass, or metal—are used. For instance, Ethiopia's coffee, a major export, is often vacuum-sealed to maintain freshness for international markets. Finished textiles and leather goods such as shoes, bags, and garments are often packaged in plastic or cardboard containers or boxes for protection and ease of transportation.

v. Distribution

Once agro-products are processed and packaged, they enter the distribution phase. This stage involves delivering products to domestic or international markets. In Ethiopia, packaged agro-processed products are domestically distributed through various channels, including wholesalers, retailers, and cooperatives. Urban areas like Addis Ababa serve as key hubs for the distribution of these goods. The country's primary exports, such as coffee, leather, and textiles, are shipped to markets in Europe, North America, and the Middle East. Exporting these goods requires compliance with international packaging and labeling standards like those set by the ISO to meet the requirements of markets such as the European Union and the United States (ISO 2015).

Distribution faces several challenges in Ethiopia. Local challenges include poor road infrastructure, limited cold storage facilities, and an underdeveloped supply chain hinder the effective distribution of agro-processed products within Ethiopia (Tessema 2023; Debela 2013). International distribution involves additional challenges faced by the Ethiopian companies such as compliance with stringent packaging regulations, high logistics costs, and the need to remain competitive in global markets (Tadesse et al. 2022). For Ethiopia's agro-processed products to be competitive in global markets, they must adhere to international packaging standards. These majorly include guidelines for labeling, food safety, and environmental sustainability. In this regard, packaging must meet ISO standards for quality and safety, ensuring that products can enter foreign markets without issue (ISO 2015). Environmental regulations are increasingly critical, with international pressure driving exporters to adopt sustainable packaging practices.

vi. Sustainability and innovations in packaging

With the global shift toward sustainability, Ethiopia must explore sustainable packaging solutions to reduce environmental impacts. For instance, opportunities exist to develop biodegradable packaging materials using plant-based fibers, which could be sourced locally and help reduce waste (Kozik 2020; Siracusa and Rosa 2018). Ethiopia could also benefit from investing in recycling initiatives to reuse packaging materials and promote a circular economy (Siracusa and Rosa 2018). The adoption of smart packaging solutions, such as tamper-proof packaging and QR codes for traceability, would enhance the country's competitiveness in international markets (ISO 2015).

vii. Opportunities for growth

While challenges exist, Ethiopia's agro-processing and packaging sectors have significant growth potential. By improving infrastructure, adopting modern technologies, and enhancing compliance with international standards, Ethiopia can improve the competitiveness of its packaged agro-processed goods both domestically and internationally. Leveraging trade agreements is one of the potential windows of opportunity Ethiopia can take advantage of preferential trade agreements like the African Continental Free Trade Area (AfCFTA) to expand its exports to other African countries (Abrego et al. 2020; Amogne and Hagiwara 2021). Encouraging foreign direct investment in the packaging sector, particularly in the production of eco-friendly materials, could also help Ethiopia address its current packaging supply shortages and reduce reliance on imports (Manufactuing Africa 2022).

In sum, the value chain for packaging agro-processed outputs in Ethiopia is a complex but critical element in the country's agricultural and industrial landscape. From raw material production through to the packaging and distribution of finished goods, each stage of the chain involves various actors, each playing a crucial role in ensuring efficiency, compliance, and sustainability. Adopting global best practices in packaging, improving infrastructure, and fostering innovation will be key to unlocking the full potential of Ethiopia's agro-processing and packaging sectors, helping the country meet the demands of domestic and international markets while ensuring environmental sustainability.

03.5: Actors mapping in Ethiopia's agro-processed product packaging industry

The Ethiopian packaging industry for agro-processing involves a wide range of stakeholders, including government institutions, private companies, industry associations, and international development partners. The following table identifies key stakeholders and elaborates their roles and contributions to the development of the packaging value chain for agro-processed products.

Table 11: Key stakeholders & roles for agri- production value chain & packaging

Category	Stakeholder	Role
Government Institutes	**Ministry of Trade and Regional Integration (MoTRI)**	MoTRI oversees trade policies and regulations, including those that pertain to packaging standards for local and international markets. It can engage in the following key interventions: ● Regulate trade policies related to packaging and labeling. ● Ensure compliance with international standards, and support the export readiness of agro-processing industries. ● Coordinate trade incentives for packaging innovations.

Category	Stakeholder	Role
	Ministry of Industry (MoI)	MoI is responsible for industrial development, including the growth of the packaging sector. It can involve in: ● Providing industrial policies and incentives (financial, infrastructure and other supports) to encourage expansion of agro-processing and packaging industries to promote innovation and expansion in packaging technology and particularly eco-friendly materials. ● Facilitating partnerships between packaging industries and agro-processors to enhance competitiveness.
	Ministry of Agriculture (MoA)	MoA plays a significant role in facilitating the upstream supply of raw materials for agro-processing industries. It: ● Provides guidance, research, and support to ensure the quality and quantity of agricultural products produced meet market and processing standards. ● Coordinates the production of raw materials for agro-processing, ensuring the packaging needs are integrated into agricultural value chains, and ● Works to reduce post-harvest losses through improved packaging solutions.
	Agricultural Transformation Agency (ATA)	The ATA focuses on improving the efficiency of Ethiopia's agricultural value chains, which includes packaging as a critical component for reducing post-harvest losses. It can specifically: ● Introduce and scale modern packaging solutions for smallholder farmers and cooperatives. ● Promote innovative packaging solutions that reduce waste and extend the freshness of agricultural products during transport and storage. ● Implement strategic initiatives to modernize agriculture and improve efficiency, particularly in post-harvest handling and packaging for market readiness. ● Offer technical assistance, and disseminate best practices to increase the efficiency of agricultural packaging solutions.
	Institute of Ethiopian Standards (IES)	The IES is responsible for developing, reviewing, and enforcing national standards for packaging. Notably, its key roles and responsibilities encompass to:

Category	Stakeholder	Role
		• Develop and enforce packaging standards used in agro-processing industry to ensure product safety, quality, and environmental sustainability. • Ensure that packaging complies with local and international regulations, such as food safety standards and sustainability guidelines (e.g., ISO). • Provide certification for companies meeting the standards.
	Ministry of Innovation and Technology (MoIT)	MoTI plays a significant role in promoting technological innovations in the packaging industry Facilitate research and technological advancements in packaging. It can specifically: • Support innovation in packaging solutions, especially in sustainable, eco-friendly, and biodegradable packaging technologies. • Provide grants and support for tech start-ups in the packaging sector.
	Ethiopian Investment Commission (EIC)	• Promote and facilitate investment into Ethiopia's agro-processing and packaging sector. • Provide incentives for foreign direct investment (FDI) and partnerships with local companies. • Provide support to entrepreneurs entering the packaging market.
Private Sector Actors	**Chamber of Commerce and Sectoral Associations**	• Promote favorable trade policies and networking opportunities. • Serve as a platform for dialogue between private sector stakeholders and the government to ensure and advocate the needs and interests of agro -processing and packaging industries are considered in policy decisions • Offer training and support on export packaging regulations, and organizes trade fairs that showcase innovations in packaging for agro-processed products.
	Agro-Processing Industries (food, textile, leather, others)	• Drive demand for packaging materials, ensuring that packaging solutions meet industry-specific needs such as product protection, branding, and compliance with health and safety regulations. • Collaborate with packaging industries to ensure that materials meet the specific needs of different processed products. • Process raw agricultural products into food, textiles, leather and other agricultural goods suitable for packaging and distribution.

Category	Stakeholder	Role
	Packaging Industries	• Manufacture and supply packaging (such as plastic, paper, metal, glass, and biodegradable options) to agro-processors based on the specific needs of processed products with a focus on sustainability, cost-effectiveness, and innovation. • Collaborate with agro-processors and other stakeholders to customize solutions based on product type and market requirements.
	Plastic, paper, metal and wood manufacturing industries	• Produce raw materials for packaging (such as plastic, metal, wood, and paper) that are used by packaging industries to package agro-processed products.
	Retailers and wholesalers/ distributors	• As key players in the supply chain, drive market demand for packaging that is convenient, sustainable, and appealing to consumers. • Provide feedback to agro-processors and packaging industries about consumer preferences and concerns, particularly regarding eco-friendly packaging. • Ensure packaging complies with local and international retail standards.
	Exporters	• Work closely with packaging industries to ensure that products meet international shipping and handling standards, reducing product damage and ensuring regulatory compliance in foreign markets.
	Packaging startups	• Innovate new biodegradable, recyclable, or reusable packaging solutions for food, textiles, and leather goods.
Academic and Research Institutes	**Universities**	• Conduct research on innovative packaging materials and processes, contributing to knowledge sharing and the development of industry-ready professionals. • Offer technical expertise to both the private and public sectors is an added role of universities.
	Agricultural research institutes	• Research into more efficient farming techniques and higher-quality crops that are suitable for processing and packaging. • Focus on applied research into sustainable packaging solutions for agro-processing, such as eco-friendly materials and practices that reduce spoilage and preserve product quality during transportation.

Category	Stakeholder	Role
NGOs, International Organizations, and associations	**Non-Governmental Organvcrfiounizations(NGOs)**	• Provide support in training and capacity building for smallholder farmers and agro-processors on the use of sustainable and affordable packaging. • Promote sustainable packaging solutions and offer support to businesses transitioning to eco-friendly packaging materials.
	International Development Partners (such as UNIDO and FAO)	• Offer technical assistance, financing, and capacity-building programs aimed at improving the overall competitiveness and sustainability of Ethiopia's packaging sector. • Collaborate with government bodies to implement global best practices.
	Packaging industry associations	• Act as a collective voice for packaging businesses, advocating for regulatory changes, standards, and policies that support industry growth. • Facilitate collaboration, training, and knowledge sharing among members. • Engage in promoting sustainable packaging solutions and innovation across the sector.
	Agro-processing industry associations	• Advocate for the needs of agro-processors in terms of packaging standards, costs, and innovation. • Collaborate with government agencies to ensure that the packaging of agro-products is competitive and meets international market demands. • Provide industry-level feedback on packaging challenges and opportunities.
	Agricultural cooperatives	• Collect and aggregate produce from smallholder farmers to supply large-scale processors and distributors. • Collaborate with agro-processors and packaging industries to ensure that produce is handled, stored, and transported using packaging that maintains quality from farm to market. • Demand proper packaging to reduce post-harvest losses.
Others	**Financial institutions**	• Provide financing solutions to packaging companies, entrepreneurs, and agro-processors for investment in modern packaging technologies. • Promote funding schemes that focus on sustainability in the packaging sector.
	Logistics and transportation companies	• Transport raw agricultural products from farms to processing units and aggregation centers while

Category	Stakeholder	Role
		ensuring minimal damage or spoilage during transit. • Provide services for the transportation of packaged goods, ensuring that packaging prevents spoilage or damage during transit. • Manage cold-chain logistics for perishable goods, where packaging must maintain temperature control. • Innovate in logistical solutions that reduce packaging waste and improve efficiency.
	Storage facility providers	• Offer facilities for the safe storage of aggregated agricultural produce before being transferred to processing units.
	Farmers	• Cultivate and harvest agricultural products that will enter the agro-processing value chain. • As farmers are key raw material providers for agro-processing, they benefit from improved packaging solutions that extend shelf life, reduce waste, and improve market access. • Work with cooperatives to implement post-harvest packaging solutions.
	End consumers	• Influence market demand by preferring products with sustainable, eco-friendly packaging. • Participate in recycling programs and demand transparency from companies about the environmental impact of their packaging choices. • Provide feedback that shapes the development of future packaging innovations.
	Recycling Companies & Waste Management	• Collect, sort, and process packaging waste for recycling.
	Municipalities & local/regional governments	• Manage local waste management systems, including the collection and recycling of packaging materials. • Work closely with waste management companies to promote sustainable waste reduction and ensure compliance with national recycling programs related to packaging.

03.6: Feasibility of packaging innovation for young entrepreneurs

The feasibility of packaging innovations for young Ethiopian entrepreneurs is influenced by multiple factors. To develop scalable solutions that serve both domestic and international markets, these innovators must consider several elements, including material availability, financial aspects like

cost and revenue, market demand, technological viability, logistical hurdles, regulatory requirements, and environmental concerns.

A feasibility of a given idea, including packaging innovation for agro-processed products, must at least consider the following key elements (Bause et al. 2014; Thompson 2005; Jebrin 2017).

1. **Market Analysis** explores the demand for the product or service, who the target audience is, and the competition in the market. Understanding market needs ensures that the project has potential customers.
    - Market analysis involves evaluating the available demand and potential growth to ensure market for a product which is a key for determining feasibility of agro-processed products packaging. Relatedly, understanding consumer preferences, such as packaging materials, designs, and sustainability, is crucial to meet customer needs. Equally, identifying the target market helps define appropriate packaging solutions, whether for domestic or export use. Analyzing competitors' packaging also offers insights into market trends and expectations, helping young entrepreneurs tailor their offerings and stay competitive. Understanding the competitive environment is indeed determinantal for developing effective strategies. This mainly involves: (i) analyzing current competitors in the agro-processing sector to find gaps in their products that new packaging innovations can address, and (ii) explore how the new packaging can stand out from what's already available, especially in terms of its functionality and sustainability.
    - Growing household income and urbanization in general boosts demand for modern, and attractive packaging. Aligned with such phenomena, entrepreneurs, for example, may focus on lightweight, resealable packaging that ensures freshness during shipping, such as resealable coffee bags with moisture control. They can also integrate Ethiopian cultural symbols into packaging designs for local products like spices or coffee can further boost appeal.

2. **Technical Feasibility** examines whether the technical resources—like technology, equipment, and expertise—are available and sufficient to make the project work. This includes analyzing if the business has the capabilities to deliver the product or service.
    - Technical feasibility of packaging for agro-processed products depends on several factors. The physical characteristics of the product, such as shelf life and sensitivity to environmental conditions which determine specific packaging needs; the availability and cost of materials like paper, plastic, or metal; access to suitable packaging technologies, including machinery and technical expertise; and the availability of skilled labor and resources needed to implement packaging solutions effectively are among the key elements young innovators should consider prior to practical engagement.
    - With such barefaced challenges in Ethiopia, young entrepreneurs could invest in affordable local machinery or seek partnerships with foreign investors to bring in technology. Shared access to equipment through local agro-processing hubs could also be a solution. For example, utilizing shared vacuum-sealing machines for meat products could allow multiple businesses to innovate affordably.

3. **Financial and Economic Feasibility**: Financial aspects like cost estimates, funding requirements, revenue projections, and profit potential are evaluated along with economic viability elements such as financing, cost benefit analysis and return on investment (ROI) which would help determine whether the project can be profitable and if investors or stakeholders will see a return.
    - The financial and economic feasibility of packaging for agro-processed products focuses on balancing costs and potential returns. These primarily include: Conducting a cost-benefit analysis to determine whether the expense of developing new packaging solutions is justified by financial benefits like extended product shelf life, enhanced brand image, or consumer appeal; Return on investment (ROI) to evaluate expected increases in sales, market share, and overall profitability resulting from these innovations; and Exploring financing options like loans, government grants, and private investments to support packaging ventures.
    - In Ethiopia, the cost of packaging materials is influenced by the availability of raw materials, many of which are imported, raising production costs (Manufactuing Africa 2022). To lower these costs, young entrepreneurs could explore locally available materials such as bamboo, plant-based fibers, or recycled plastics. For instance, using recycled plastic for food packaging or bamboo fibers for biodegradable containers could offer both cost savings and sustainability (Kassahun 2014).
    - Particularly shortage of funds is a common issue among business startups and innovators in Ethiopia (Amentie, Negash, and Kumera 2016). Yet, young innovators can explore government programs, micro-financing, and international grants to secure funding. Sustainable and innovative businesses may also attract foreign investment or crowdfunding. For example, a crowdfunded biodegradable packaging initiative might appeal to socially conscious investors, and hence such innovative funding sources need to be tested and capitalized in the Ethiopian context.

4. **Operational Feasibility**: This looks at the internal workings of the organization, including management, staffing, and processes. It assesses whether the day-to-day operations can support the successful execution of the project.

    - In this connection, looking in-depth the operational feasibility helps to vividly understand the practical side of implementing new packaging solutions. This involves assessing whether current supply chains can handle the new materials and processes without causing major disruptions. It is also important to ensure that there are enough resources, such as time, labor, and equipment, available to implement these packaging innovations while keeping other business operations running smoothly.

    - For instance, Ethiopia's transportation infrastructure can be challenging, particularly for long-distance product distribution. To tackle this challenge, entrepreneurs may design lightweight, durable packaging that withstands rough

handling. Flexible pouches for grains or snacks could also be effective to reduce bulk and improving logistics efficiency.

5. **Legal and Regulatory Compliance**: Any legal issues or government regulations that need to be addressed are examined, ensuring the project meets all necessary requirements (e.g., licenses, environmental regulations).
   - Young entrepreneurs considering product packaging business must adhere to various legal and regulatory compliances. To name few, food safety regulations are paramount to ensure that packaging materials meet safety standards, protecting consumers and building trust in the market (Keller, K. L., & Swaminathan 2019). Labeling requirements must also be followed to ensure packaging provides accurate and transparent product information, such as ingredients, origin, and shelf life, to meet consumer expectations and legal standards (EFDA 2022). Compliance with environmental regulations is crucial as packaging solutions must minimize their ecological impact by utilizing materials that are either recyclable, biodegradable, or meet environmental safety standards (Arvanitoyannis, I. S., & Bosnea 2004). Further, intellectual property rights should be considered, especially if unique packaging designs or technologies are developed to protect innovations through patents and trademarks.
   - Notably, complying with food safety standards is a must for packaging products in sectors like dairy, meat, and beverages in Ethiopia (EFDA 2022). In this regard, entrepreneurs can collaborate with local universities or research institutions to test packaging innovations for compliance. For instance, packaging that complies with international food safety standards for meat products could enhance both local sales and export opportunities.

6. **Environmental and social factors**: Environmental factors focus on the project's effects on natural resources and sustainability, such as using eco-friendly materials to reduce waste. Social factors consider how the project affects local communities, including job creation and community involvement.
   - Consumers are increasingly focused on sustainability, making eco-friendly packaging essential for enhancing brand image and attracting conscious buyers. Exploring biodegradable or recyclable materials meets this demand, while flexible packaging innovations help adapt to evolving environmental regulations. Ethical sourcing and community involvement in packaging design also promote sustainability and build a positive brand reputation.
   - Importantly, sustainability is nowadays becoming a priority for consumers and businesses globally including Ethiopia and hence young entrepreneurs should consider introducing various resource-based environmental friendly packaging solutions such as biodegradable containers for dairy products.

All in all, the feasibility of agro-processed product packaging innovations in Ethiopia for young entrepreneurs' hinges on a complex interplay of market, technical, economic, regulatory, and social-environmental factors as detailed above. Careful consideration of such factors and implementing innovative packaging solutions can make entrepreneurs contribute to the growth of the agro-processing industry, enhance product quality and safety, and promote sustainable development in Ethiopia.

03.7: Practical tips for young entrepreneurs in agro-processing packaging

Ethiopia's agro-processing industry is expanding rapidly which creates valuable opportunities for young entrepreneurs in the packaging sector. The demand for high-quality packaging that ensures product safety, extends shelf life, and enhances visual appeal is growing for products like coffee, spices, dairy, and grains that destined to local and international markets. Packaging plays an imminent role in preserving freshness, meeting export standards, and attracting consumers. This presents a chance for young innovators to make them develop unique, sustainable, and functional packaging solutions. In line with this, the ensuing guide provides practical, step-by-step guidance for starting a packaging business, detailing strategies for identifying market needs, utilizing local resources, and achieving long-term success in this industry.

1. **Identify market gaps and demand**

   The first thing to do is undertaking thorough market research to understand the specific packaging needs of the agro-processing industry both for local and international markets. This includes identifying the types of products that require packaging, such as fruits, vegetables, dairy, and processed foods. For instance, entrepreneurs can create export-oriented packaging solutions that meet international food safety standards, opening opportunities in markets like Europe and the U.S. for products such as coffee, spices, and honey. They can also identify packaging needs for traditional Ethiopian products like '*Injera', 'Teff', 'Berbere', 'Shiro'* and others by focusing on preserving freshness and ensuring durability for local and export markets. According to Manufactuing Africa (2022), Ethiopia's packaging manufacturing opportunity is projected to reach USD 971 million by 2030, with over 50% of this potential concentrated in the food and beverage sectors (How We Made It in Africa, 2023[13]).

2. **Utilize local and eco-friendly materials, and embrace sustainability**

   Young entrepreneurs can reduce costs and promote sustainability because consumers nowadays are becoming more environmentally conscious making significant opportunity for businesses that focus on sustainable packaging solutions. As mentioned before, entrepreneurs can consider producing biodegradable or recyclable packaging option (such as recycled plastic for coffee bags or bamboo fiber for traditional foods containers such as '*Injera'*) by using locally available materials like bamboo, recycled paper, or other plant-based materials which can help reduce reliance on costly imports. In addition, implementing effective waste management practices can enhance business sustainability while contributing positively to the environment. Entrepreneurs can reduce waste by using recycled materials and creating systems where customers can return packaging for reuse, especially in urban areas with growing waste concerns.

3. **Start small and scale gradually**

   Gradual scaling up helps young entrepreneurs minimize investment risks, build customer relationships, and ensure that solutions meet local needs effectively which also sets a solid

[13] How We Made It In Africa. (2023). 12 investment opportunities in Ethiopia's packaging industry. Retrieved from https://www.howwemadeitinafrica.com/12-investment-opportunities-in-ethiopias-packaging-industry/137390/

foundation for future growth in the industry. In this regard, entrepreneurs should start small and gradually scale their packaging businesses by focusing on niche markets. It's also important to test packaging solutions in smaller, local markets first by collaborating with local food processors, farmers' cooperatives, or SMEs to refine products and address any challenges before expanding to larger or export markets.

4. **Focus on functionality and consumer appeal**

   Focusing on functionality and consumer appeal is important because strong packaging protects products during shipping, while attractive designs draw in customers which help boost sales and build loyalty and hence leads to business growth. Packaging in the agro-processing sector must be designed to withstand transportation challenges, particularly for e-commerce or long-distance shipping. It is therefore essential to use materials that ensure **durability** such as **resealable plastic bags** for coffee or **moisture-resistant packaging** for grains. Consumer appeal can be brought via infusing traditional Ethiopian designs and patterns that reflect Ethiopia's rich culture into packaging to appeal to both local pride and international curiosity.

5. **Invest in technology and innovation**

   Investing in technology and innovation is important for improving packaging processes and staying competitive. As advanced and more sophisticated machinery can be expensive, young entrepreneurs can begin by exploring affordable local alternatives or simple packaging technologies like heat-sealing machines or vacuum-packers, before gradually investing in more advanced options, such as Modified Atmosphere Packaging (MAP) for meat or dairy. Further, application of digital tools like computer-aided design (CAD) software to create and test new packaging designs allow for functional and visually appealing results without costly of physical trials.

6. **Comply with regulations and standards**

   Entrepreneurs need to familiarize themselves with local and international packaging standards and regulations regarding food safety and packaging standards as compliance with such regulations is critical for market entry and long-term success. For instance, young business founders must ensure that packaging adheres to the Ethiopian Food and Drug Administration (EFDA) requirements and international food safety standards particular if they aim to export products (EFDA 2022). They should also work closely with Ethiopian and international certification bodies to safeguard that the packaging solutions meet global safety and sustainability standards which could help the entrepreneurs gain market entry abroad and build trust with local/Ethiopian consumers.

7. **Form strategic partnerships**

Working with smallholder farmers and farmers cooperatives and unions to develop packaging solutions tailored to their specific needs help business startups fill gaps in various dimensions. For instance, partnering with dairy or honey producers helps to create packaging needs that meets their specific needs and regulatory standards. Such partnerships initiatives with local farmers also helps to ensure a steady supply of quality raw materials and help educate farmers about best practices in handling and processing their products. On the other hand, collaborating with international investors can provide access to capital, advanced technology, and expertise, helping improve packaging solutions and expand into larger markets.

8. **Access financing and support**

   Accessing financial support and government incentives is determinantal for business growth in packaging. Young entrepreneurs have to explore and exploit relevant government incentives like tax breaks by registering with bodies such as the EIC. They should also seek out funding opportunities provided by government programs, NGOs, or international organizations focused on supporting agribusiness initiatives (World Bank, n.d.[14]). They can apply for grants, micro-financing, or government-backed loans to fund sustainable and innovative packaging solutions. Crowdfunding can also help attract investment for eco-friendly packaging projects from both local and international supporters.

9. **Build expertise through training and knowledge transfer**

   Building expertise through training and knowledge transfer is a pathway for entrepreneurs to stay competitive and innovate continuously. It is advisable to attend different workshops and expos to learn new packaging technologies and help entrepreneurs keep up to date on the latest packaging trends and technologies. This will give exposure to innovative packaging designs, materials, and machinery, which can be adapted to the local (Ethiopian) market. It is also important for emerging business startups to consider joining business incubators that provide mentorship, training, and networking opportunities tailored to agro-processing and packaging entrepreneurs.

In general, establishing a successful packaging business in Ethiopia's agro-processing industry requires young innovators to make use of local resources, adopt sustainable practices, and remain flexible in responding to market needs. Young entrepreneurs can create innovative packaging solutions that cater to Ethiopia's growing agro-processing sector and they can position themselves for both domestic and international success notably by understanding the market dynamics, tapping into available government incentives, and forming strategic partnerships.

[14] World Bank. (n.d.). Agribusiness Entrepreneurship Program: Promoting Growth Entrepreneurs in Agro-Processing. Retrieved from https://documents1.worldbank.org/curated/pt/323841562130317446/text/Agribusiness-Entrepreneurship-Program-Promoting-Growth-Entrepreneurs-in-Agro-Processing.txt

Chapter 04 – Conclusion and Recommendations

04.1: Conclusion

Agriculture is a key pillar of Ethiopia's economy, contributing an average of 32% to GDP, compared to 29% from industry and 40% from services (NBE 2024). Nearly 82% of Ethiopia's exports come from agriculture, with crops and livestock making up 76.5% and 3.5% of the share, respectively (NBE 2024). The country's agricultural sector is a primary source of livelihood for a large portion of the population, yet much of its potential remains untapped due to limitations in value addition and market access. One of windows of opportunities to exploit from the agriculture sector is to engage into effective packaging practice as it plays a crucial role in enhancing product marketability, shelf-life extension, and overall competitiveness in both domestic and international markets.

Agro-processing industry product packaging refers to the intricate process of designing, creating, and implementing packaging materials and methods specifically tailored for agricultural products that have undergone processing or value addition. This multifaceted approach encompasses a variety of tasks aimed at safeguarding, enhancing, and marketing agro-processed goods, which may include fruits, vegetables, grains, meats, and dairy products (Mengistu et al., 2019).

Recent trends show that there has been a notable observation on the rise in demand for agro processed products packaging locally and globally. To tap the potential niches in the demand side observed, this study was initiated to explore potential business opportunities in product packaging for the agro-processing industry and evaluate the feasibility of manufacturing packaging solutions for agro-processed goods. The study utilized both primary and secondary data to conduct the assessment.

Different countries best practices explored provide various dimensions to learn lessons. The Kenyan practice reveals a shift towards resource based and sustainable packaging solutions backed by adoption of supportive regulatory framework, and capacity building initiatives to enhance agro-products packaging skills and knowledge (Arvanitoyannis, I. S., & Bosnea 2004). The Indian experience is praised for adoption of sustainable practices, embracing active technology, and widespread use of flexible packaging materials (such as laminated pouches and sachets) that offer a cost-effective and lightweight solution for protecting agro-processed products which are particularly suitable for small-scale producers that commonly used for packaging spices, tea, and snacks (Chikweche, T., & Fletcher 2012). Germany is reputable for its sustainable and innovative packaging practices such as the use of biodegradable and compostable materials as well as use of smart packaging solutions like RFID tags and QR codes (Keller, K. L., & Swaminathan 2019; Pagotto, M., & Fabbricino 2018). Perhaps by far, the US practice excel in terms of innovation, convenience, and sustainability of agro-processed goods packaging (Bakalis, S., Valdramidis, V. P., Argyropoulos, D., Ahrne, L., Cullen, P. J., Gertsis, A. C., & Van Impe 2015). All in all, experiences of these and other countries offers a plentiful opportunity to countries like Ethiopia where the packaging industry for agro-processed products is at its infancy.

The Ethiopian packaging industry is maneuvered with few players having limited experiences and capacity. Most operational packaging investments are concentrated in and around Addis Ababa. The investment landscape is dominated by interests to engage into the sector with low conversion rates into operational stages. The EIA archive shows only 95 packaging industry investments converted to operation between 2014 and 2022 of which about three-fourth engaged dominantly in the manufacture of paper packages, with the remaining shares going to manufacture of plastic, metal, glass and other packaging streams. As per MoTRI, there are about 669 licensed paper and paper products packaging businesses with the majority concentrated in Addis Ababa.

Ethiopia dominantly meets its packaging requirement through import, showing a critical gap for local manufacturers to fill. The food and beverage sector dominates the packaging market compared to other industries. Key challenges the sector faces encompass low competitiveness and small-scale operations, costly and difficult raw material imports, stringent regulatory conditions, and an overall low ease of doing business. Yet, there is a significant investment opportunity across the packaging value chain in the country, particularly in raw material manufacturing and conversion, with notable gaps in pulp production, paperboard, liquid cartons, rigid plastics like preform bottles, and flexible plastics. According to Ethiopia's packaging consumption is projected to double by 2030 expanding into a market worth approximately USD 1.3 billion, with 60-80% of this market being addressable by local manufacturers (Manufactuing Africa 2022).

This study's finding shows that several factors determine the market trends and demand for packaging of agricultural products in Ethiopia, including the agriculture sector growth, the growing demand for cold chain packaging and sustainable packaging, export market trend and compliance with international standards, increasing consumer awareness, demand driven technology integration into packaging and others.

The value chain for packaging agro-processed outputs in Ethiopia is an intricate, multi-layered system that plays a crucial role in transforming raw agricultural products into packaged goods ready for consumption or export. This chain involves various stages, each with its own set of challenges and opportunities, from the production of raw materials to the delivery of finished products to the market. The study elaborated that the value chain analysis for agro-processed product packaging is framed into seven key stages: agricultural production, collection and aggregation, primary processing, secondary processing and packaging, distribution and opportunities for growth highlight potential areas for expansion and improvement in the value chain. The report further includes a detailed stakeholder mapping, clearly outlining key actors and their roles within the agricultural production value chain and sustainable packaging ecosystem.

The study also identified areas deciding feasibility of packaging industries for agro-processed products that young entrepreneurs could engage. We underscored the need for appraising the market, technical, financial & economic, environmental, operational, legal and regulatory compliance feasibilities for agro-processed packaging industry startups to engage.

We provided practical tips for young entrepreneurs engaging or planning to engage in agro-processed products packaging stream in the country. The advices for practical engagement embrace the need to identify market gaps and demand, sustainability and resource-endowment considerations, the importance for gradual scaling up, the need to comply with regulations and standards, and others.

All in all, the study assessed the landscape and status of Ethiopia's agro-processed products packaging, identified market trends, opportunities and key gaps, mapped the value chain, pinpointed the decisive feasibility elements, and provided tips for practical engagement. Notably, Ethiopia has a massive potential for agro-processed product packaging but multifaceted efforts and measures are required from all stakeholders to ease the challenges surfaced and gear paths aligned with global emerging trends and good practices.

04.2: Recommendations

To enhance the competitiveness of Ethiopia's agro-processing sector, significant improvements are needed in the packaging industry. Packaging plays a critical role in ensuring the quality, safety, and marketability of agro-processed products, both locally and internationally. Nonetheless, the sector faces several challenges as elaborated before under different sections of this paper. Addressing the hurdles through targeted interventions can boost the sector's ability to meet growing demand, improve product quality, and strengthen its position in the global market. The following recommendations outline key strategies to drive growth and innovation in Ethiopia's packaging sector for agro-processed industries.

- **Improve ease of doing business in the packaging industry.**
    - One of the challenges identified in the packaging sector relates to difficulty in doing business. In that line, the responsible authorities such as the MoTRI, EIC and infrastructure and utility providing companies need to simplify business registration and startup processes, improve utility and infrastructure services and streamlining post-licensing procedures to encourage new ventures and expedite the conversion of licensed investments.

- **Improve local competitiveness.**
    - Aligned with Manufactuing Africa (2022) recommendations, local companies should reduce costs by optimizing supply chains, improve quality through better materials and technology, enhance customer service, and diversify product offerings with more customization to be globally competitive. This could also be achieved through extensive provision of capacity building schemes targeting the sector.

- **Diversify the packaging landscape from dominantly paper based to other sustainable and resource-based packaging solutions.**
    - The Ethiopian packaging landscape need to diversify particularly in underrepresented categories like 'Manufacturing of Cartoon Packages' and 'PP Woven Bag & Flexible Packaging' to reduce reliance on paper packaging and offer alternative solutions.

- **Adopt best practices from countries that give focus to sustainability, emerging technologies and safety considerations.**
    - Ethiopia can learn and adopt sustainable and technology integrated packaging practices for agro processed products from countries both in developing and

developed world such as Kenya, China, the US and Germany that demonstrated the pioneering role in the sector.

- **Encourage packaging industries to deconcentrate from Addis Ababa.**
  - Most packaging industries currently concentrate in and around Addis Ababa. In this regard, there is a need expand the packaging sector to underrepresented areas to promote a more balanced growth in the country. This could be achieved through different targeted policies. For example, offering tax incentives, improving infrastructure, and supporting local market development could attract more businesses to regions like Somali, South West, Amhara, Gambell, and Central Ethiopia regions. Further, leveraging the strong base in Addis Ababa and Oromia by enhancing linkages with other regions and creating packaging hubs could further stimulate growth.

- **Encourage domestic production, especially in the raw material chain of the packaging manufacturing segment for import substitution.**

- **Provide adequate policy support and incentives to the sector**
  - Supportive government policies, such as tax incentives, subsidies for green packaging, or simplified regulations, could attract more investments, particularly in niche areas. In addition, encouraging innovation and technological advancement in the packaging sector through such as partnerships with research institutions, grants for innovative solutions, or industry-specific expos could create new opportunities and foster growth in the sector. Different start-up and operational level constraints faced by entrepreneurs, such as limited access to finance/capital, land, knowledge/skills and market could be systematically and strategically addressed with collaborative government and non-government efforts.

- **Timely regulations and standards.**
  - The responsible law makers should issue standards and regulations related to packaging in a dynamic and timely manner. In this regard, capacity of the responsible government body need to be improved.

- **Wide public awareness and advocacy strategies on the importance and benefits of innovative, sustainable, resource-based packaging solutions.**

05: References

Abegaz, T., Kebret, M., Arega, A. 2017. “Challenges and Opportunities of Agro-Processing Industries in Ethiopia: A Case Study of Addis Ababa.”

Abraham, Mathew, Leslie Verteramo Chiu, Ekta Joshi, Muhammad Ali Ilahi, and Prabhu Pingali. 2022. “Aggregation Models and Small Farm Commercialization–A Scoping Review of the Global Literature.” *Food Policy* 110: 102299.

Abrego, Mr Lisandro, Mr Mario de Zamaroczy, Tunc Gursoy, Garth P Nicholls, Hector Perez-Saiz, and Jose-Nicolas Rosas. 2020. *The African Continental Free Trade Area: Potential Economic Impact and Challenges*. International Monetary Fund.

Aggarwal, Aradhna. 2007. “Impact of Special Economic Zones on Employment, Poverty and Human Development.” 194. New Delhi. http://hdl.handle.net/10419/176213%0AStandard-Nutzungsbedingungen:

Ahmed, Ishfaq, Hong Lin, Long Zou, Zhenxing Li, Aaron L Brody, Ihsan Mabood Qazi, Liangtao Lv, Tushar Ramesh Pavase, Mati Ullah Khan, and Sohaib Khan. 2018. “An Overview of Smart Packaging Technologies for Monitoring Safety and Quality of Meat and Meat Products.” *Packaging Technology and Science* 31 (7): 449–71.

Almenar, E., Samsudin, H., Auras, R., & Harte, B. 2017. “A Guide to Packaging Innovations and Shelf-Life Extension of Food Products.” *Comprehensive Reviews in Food Science and Food Safety* 16 (5): 745–70.

Amentie, C, E Negash, and L Kumera. 2016. “Barriers to Growth of Medium and Small Enterprises in Developing Country: Case Study Ethiopia.” *Journal of Entrepreneurship and Organization Management* 5 (3): 1–4.

Amogne, Habtamu Shiferaw, and Taiji Hagiwara. 2021. “Impact of Alternative Regional Trade Arrangements on the Ethiopian Economy.” *Journal of Economic Structures* 10 (1): 2.

Aragaw, Tadele Assefa. 2021. “Microplastic Pollution in African Countries’ Water Systems: A Review on Findings, Applied Methods, Characteristics, Impacts, and Managements.” *SN Applied Sciences* 3 (6): 629. https://doi.org/10.1007/s42452-021-04619-z.

Arvanitoyannis, I. S., & Bosnea, L. 2004. “Migration of Substances from Food Packaging Materials to Foods.” *Critical Reviews in Food Science and Nutrition* 44 (2): 63–76.

Bakalis, S., Valdramidis, V. P., Argyropoulos, D., Ahrne, L., Cullen, P. J., Gertsis, A. C., & Van Impe, J. F. 2015. “Perspectives from Developing and Developed Nations on Food Security and Safety: Issues and Challenges.” *Food Research International* 68: 49–62.

Bause, Katharina, Aline Radimersky, Marinette Iwanicki, and Albert Albers. 2014. “Feasibility Studies in the Product Development Process.” *Procedia CIRP* 21: 473–78. https://doi.org/https://doi.org/10.1016/j.procir.2014.03.128.

Bekabil, Urgessa Tilahun. 2014. “Review of Challenges and Prospects of Agricultural Production and Productivity in Ethiopia.” *Journal of Natural Sciences Research* 4 (18): 70–77.

BELAY, TULU. 2020. “Determinants of Agricultural Export in Ethiopia.” St. Mary’s University.

Bernard, Tanguy, David J Spielman, Alemayehu Seyoum Taffesse, and Eleni Zaude

Gabre-Madhin. 2010. *Cooperatives for Staple Crop Marketing: Evidence from Ethiopia*. Vol. 164. Intl Food Policy Res Inst.

CCA. 2022. “Digital Agriculture Profile: Ethiopia: Crative Common Attrubite.”

Chikweche, T., & Fletcher, R. 2012. “Revisiting the Marketing Mix for Food Products in Sub-Saharan Africa: Insights from a Local Commodity Value Chain.” *Journal of Consumer Marketing* 29 (4): 293–310.

Christensen, C. M., Bartman, T., & Van Bever, D. 2016. “The Hard Truth about Business Model Innovation.” *MIT Sloan Management Review* 58 (1): 31–40.

CSA. 2017a. “Report on Crop and Livestock Utilization.” Vol. VII.

———. 2017b. “Report on Small Scale Manufacturing Industries.” Addis Ababa: Central Statistical Agency (CSA).

———. 2018a. “Large and Medium Scale Manufacturing and Electricity Industries Survey.” Addis Ababa, Ethiopa.

———. 2018b. “Report on Area and Production of Major Crops.” *Statistical Bulletin 586*. Vol. 586.

———. 2019. “Report on Area and Production for Major Crops.” *Statistical Bulletin 589*. Vol. I.

———. 2020. “Agricultural Sample Survey. Report on Area and Production of Major Crops.” *Statistical Bulletin 587*. Vol. I.

———. 2021. “Report on Land Utilization (Private Peasant Holdings,Meher Season): Agricultural Sample Survey 2020/21.” Vol. IV.

Debela, Fekadu Melese. 2013. “Logistics Practices in Ethiopia.”

Desalegn, Goshu, Anita Tangl, and Anita Boros. 2024. “The Mediating Role of Customer Attitudes in the Linkage between E-Commerce and the Digital Economy.” *National Accounting Review* 6 (2): 245–65.

EFDA. 2022. “Packaging and Labeling Guidelines for Food Products in Ethiopia.” Ethiopian Food and Drug Authority (EFDA).

Effie, P., & Michail, V. 2014. “Smart Packaging: Opportunities and Challenges.” *Journal of Applied Packaging Research* 6 (1): 15–28.

EIC. 2020. “Investment Opportunities in Ethiopia.” Ethiopian Investment Commission (EIC).

EPA. 2024. “National Plastic Waste Management Strategy and Roadmap (2024-2034).” Addis Ababa, Ethiopia: FDRE Environmental Protection Authority. https://www.epa.gov.et/images/2024/National Plastic Strategy and Action Plan.pdf.

EPDC. 2020. “Ethiopia 10 Years Perspective Plan (Amharic).”

FAO. 2016. “Value Chains for Nutritious Food: A Framework for Action.” Food and Agriculture Organization of the United Nations.

———. 2020. “Ethiopia Country Report: Enhancing Agricultural Productivity in Ethiopia.” Food and Agriculture Organization of the United Nations.

Fisher, E., and R. Reuber. 2000. “Industrial Clusters and SME Promotion in Developing Countries.” 3. Commonwealth Trade and Enterprise Paper. London.

https://doi.org/https://doi.org/10.14217/9781848597266-en.

Future Market Insights. 2024. “Agriculture Packaging Market Analysis, Size & Forecast 2033.” 2024. https://www.futuremarketinsights.com/reports/agriculture-packaging-market.

Ghaani, Masoud, Carlo A Cozzolino, Giulia Castelli, and Stefano Farris. 2016. “An Overview of the Intelligent Packaging Technologies in the Food Sector.” *Trends in Food Science & Technology* 51: 1–11.

Golam, Mostafa. 2006. “Challenges, Opportunities, and Threats of Textile Sector in Bangladesh: A Look into the Dacca Dyeing and Manufacturing Company Limited.” *Daffodil International University Journal of Business and Economics* 1 (1).

Howard, Emma, Carol Thijssen, and Newman Jacco. 2013. “Are Spatial Networks of Firms Random? Evidence from Vietnam.” 2. Learning to Compete. https://www.brookings.edu/wp-content/uploads/2016/07/12_manufacturing_firms_vietnam_learning_to_compete-1.pdf.

IFC. 2018. “Ethiopia Agribusiness Report: Strategies for Sustainable Growth.” International Finance Corporation (IFC).

ISO. 2015. “ISO 9000:2015 - Quality Management Systems - Fundamentals and Vocabulary.” International Organization for Standardization.

Jebrin, Ali. 2017. “The Theoretical Strategic Approach in the Feasibility Study.” *Journal of Economics, Management and Trade* 19 (2): 1–14.

Kassahun, Teshome. 2014. “Review of Bamboo Value Chain in Ethiopia.” *International Journal of African Society Culture and Traditions* 2 (3): 52–67.

Kaur, Raminder, and Jonathan Adam Watson. 2024. “A Scoping Review of Postharvest Losses, Supply Chain Management, and Technology: Implications for Produce Quality in Developing Countries.”

Kedir, Jemal. 2019. “Factors Affecting Consumer Perception towards Bottled Water in AA the Case of AQUADDIS.” ADDIS ABABA UNIVERSITY.

Keller, K. L., & Swaminathan, V. 2019. *Strategic Brand Management: Building, Measuring, and Managing Brand Equity (5th Ed.)*. 5th ed. Pearson Education.

KNBS. 2024. “Economic Survey 2024.” Nairobi: Kenya National Bureau of Statistics. https://www.knbs.or.ke/wp-content/uploads/2024/05/2024-Economic-Survey.pdf.

Kotler, P., Keller, K. L. 2016. *Marketing Management (15th Ed.)*. 5th ed. Pearson.

Kozik, Natalia. 2020. “Sustainable Packaging as a Tool for Global Sustainable Development.” In *SHS Web of Conferences*, 74:4012. EDP Sciences.

Lakshmi, K Bhagya, and K S Purnima. 2018. “Secondary Agriculture in India: Scope and Potentials.” *Indian Farmer* 5 (6): 671–74.

Le, Quoc A, Van A Tran, and Bao L Nguyen Duc. 2019. “The Belt and Road Initiative and Its Perceived Impacts on the Textile and Garment Industry of Vietnam.” *Journal of Open Innovation: Technology, Market, and Complexity*. https://doi.org/10.3390/joitmc5030059.

Logatcheva, Katja, and Michiel A van Galen. 2015. “Primary Food Processing: Cornerstone of Plant-Based Food Production and the Bio-Economy in Europe.” LEI Wageningen UR.

Long, Hoang Van. 2013. “Unequal Regional Development in Rural Vietnam: Sources of Spatial Disparities and Policy Considerations.” *Journal of Economics and Behavioral Studies* 5 (6): 325–35.

Manufactuing Africa. 2022. “Manufacturing Africa : Packaging Landscape in Ethiopia.” https://manufacturingafrica.org/download/manufacturing-africa-packaging-landscape-in-ethiopia/.

Mekonnen, Fekadu Andargie. 2023. “Legal and Practical Aspects of Payment System in E-Commerce: The Case in Ethiopia.” Debre Berhan University.

Mengistu, A., Belachew, A., Mergia, A. 2019. “The Status and Challenges of Food Processing Industries in Ethiopia.” *Food Science & Nutrition* 7 (9): 3039–3050.

Ministry of Urban Development and Housing [MUDH] Ethiopia. 2016. “National Urban Development Spatial Plan Ethiopia.”

Mohd Hanafiah, Khayriyyah, Aini Hasanah Abd Mutalib, Priscillia Miard, Chun Sheng Goh, Shahrul Anuar Mohd Sah, and Nadine Ruppert. 2022. “Impact of Malaysian Palm Oil on Sustainable Development Goals: Co-Benefits and Trade-Offs across Mitigation Strategies.” *Sustainability Science* 17 (4): 1639–61. https://doi.org/10.1007/s11625-021-01052-4.

Muthupandian, K., & Lakshminarayan, N. 2017. “The Role of Packaging in Food Safety: A Review.” *International Journal of Food Science & Technology* 52 (7): 1525–35.

NBE. 2024. “National Bank of Ethiopia:Annual Report 22/23.” https://nbe.gov.et/wp-content/uploads/2024/08/Annual-Report-2022-2023.pdf.

Nhung, Tran Thi Bich, and Tran Thi Phuong Thuy. 2018. “Vietnam’s Textile and Garment Industry: An Overview.” *Business and IT* 8 (2): 45–53.

Nozaki, Kenji. 2014. “Regional Disparity and Economic Linkage in the Greater Mekong Sub-Region.” *International Journal of Development Issues* 13 (1): 59–70.

NPC. 2020. “National Planning Commission: Ten Years Perspective Plan(2020-2030).” Addis Ababa.

Oláh, Judit, József Popp, Muhammad Asif Khan, and Nicodemus Kitukutha. 2023. “Sustainable E-Commerce and Environmental Impact on Sustainability.” *Economics & Sociology* 16 (1): 85–105.

Pagotto, M., & Fabbricino, M. 2018. “Packaging Waste Management: International Policy Approaches and Their Potential for Circular Economy.” *Resources, Conservation and Recycling* 136: 101–14.

PDC. 2020. “Ten Years Perspective Development Plan (2021 – 2030).” Addis Ababa, Ethiopa. http://www.pdc.gov.et/#/tenyearplansection.

Persson, Hanna, and Dejan Bodiroga. 2023. “Understanding The Impact Of Market Demand For Paper And Paperboard On Swedish Ports: A Scenario Planning Approach.”

Pike, S., Neale, B. 2019. *Corporate Communication: A Competing Values Approach*. Springer.

Poma, Lucio, Haya Al Shawwa, and Ilaria Vesentini. 2022. “Responding to COVID-19 Emergency: The Packaging Machinery Sector in Italy.” In *Sustainable Development Through Data Analytics and Innovation: Techniques, Processes, Models, Tools, and Practices*, 133–50.

Springer.

Prabaharan, Gokul Harsha. 2023. “A Comprehensive Study on Quality Management and Sustainability in the Field of Packaging.” International University of Applied Science, Berlin. https://www.researchgate.net/profile/Gokul-Harsha/publication/378316050_A_Comprehensive_Study_on_Quality_Management_and_Sustainability_in_the_Field_of_Packaging/links/65d4808e113afb3905137540/A-Comprehensive-Study-on-Quality-Management-and-Sustainability-.

Rasel, M, Dip Das, and Malaz Rahman Khan. 2020. “Current Scenario of Textile Sector in Bangladesh (2019); A Comprehensive Review.” *International Journal of Innovative Studies in Sciences and Engineering Technology (IJISSET)* 6 (1): 52–55.

Rodriguez, Iosselin Katiuska Fuentes. 2024. “Towards Sustainable Packaging: A Framework for the Milk and Plant-Based Beverage Industry.” Lund University. https://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=9163986&fileOId=9164004.

Schaefer, Dirk, and Wai M Cheung. 2018. “Smart Packaging: Opportunities and Challenges.” *Procedia Cirp* 72: 1022–27.

Seshadri, Triyakshana, and Virgil Henry Storr. 2010. “Knowledge Problems Associated with Creating Export Zones.” *Review of Austrian Economics* 23 (4): 347–66. https://doi.org/10.1007/s11138-010-0121-5.

Seuring, S., & Müller, M. 2018. “From a Literature Review to a Conceptual Framework for Sustainable Supply Chain Management.” *Journal of Cleaner Production* 16 (15): 1699–1710.

Siracusa, Valentina, and Marco D Rosa. 2018. “Sustainable Packaging.” In *Sustainable Food Systems from Agriculture to Industry*, 275–307. Elsevier.

Tadesse, Mahlet Demere, Helen Zewdie Kine, Girma Gebresenbet, Lóránt Tavasszy, and David Ljungberg. 2022. “Key Logistics Performance Indicators in Low-Income Countries: The Case of the Import–Export Chain in Ethiopia.” *Sustainability* 14 (19): 12204.

Tessema, Zemedkun Girma. 2023. “Qualitative Assessment and Quantitative Analysis of Key Issues and Factors in the Evolution of Ethiopian Road, Transport and Logistic Sectors: Trends, Problems, Challenges and Prospects.” Selinus University.

Thompson, Alan. 2005. “APPENDIX I-BUSINESS FEASIBILITY STUDY OUTLINE.”

UNECA. 2016. “Ethiopia Industrial Policy Brief: Agro-Processing Industry.” UNECA (United Nations Economic Commission for Africa).

UNIDO. 2019. “Ethiopia Agro-Industry Strategy: Promoting Sustainable Agro-Industrial Development.” United Nations Industrial Development Organization (UNIDO).

Urugo, Markos Makiso, Eyasu Yohannis, Tilahun A Teka, Habtamu Fekadu Gemede, Yetenayet B Tola, Sirawdink Fikreyesus Forsido, Ararsa Tessema, Mohammed Suraj, and Jemal Abdu. 2024. “Addressing Post-Harvest Losses through Agro-Processing for Sustainable Development in Ethiopia.” *Journal of Agriculture and Food Research*, 101316.

Verified Market Research. 2023. “Agricultural Packaging Market Size & Forecast.” 2023. https://www.verifiedmarketresearch.com/product/agricultural-packaging-market/.

Weiss, J., Gibis, M., Schuh, V., & Salminen, H. 2010. “Advances in Food Processing and Packaging Technology: A Comprehensive Review.” *Food Research International* 43 (9):

2341–50.

Wolde, Yodit. 2022. “Packaging and Its Effect on Brand Marketing Strategy; in the Case of Habesha Breweries SC.” ST. MARY’S UNIVERSITY.

Yigezu Wendimu, Gebissa. 2021. “The Challenges and Prospects of Ethiopian Agriculture.” *Cogent Food & Agriculture* 7 (1): 1923619.

Zerssa, Gebeyanesh, Debela Feyssa, Dong Gill Kim, and Bettina Eichler-Löbermann. 2021. “Challenges of Smallholder Farming in Ethiopia and Opportunities by Adopting Climate-Smart Agriculture.” *Agriculture (Switzerland)* 11 (3): 1–26. https://doi.org/10.3390/agriculture11030192.

06: Annexes

a. **Interview Guide** – Government and non-government institutions (Ethiopian Investment Commission (EIC), Plan and Development Commission (PDC); KII- Ministry of Trade and Regional Integration (MoTRI), Ministry of Industry (MoI), Ministry of Agriculture (MoA), Agricultural Transformation Agency (ATA), Institute of Ethiopian Standards (IES), Ministry of Innovation and Technology (MoIT) and Prominent Individuals/Scholars

---

Background

Hello, my name is (name of the interviewer) and I represent Ekuma Consultancy and Training Service Plc. Addis Ababa Chamber of Commerce and Sectoral Associations has commissioned our firm to undertake a study on Business Opportunities in Agro-processing Industry Product Packaging and prepare a report that feeds policy inputs.

Procedure

The firm will appreciate your participation in this study. If you choose to participate, I will ask you questions about your personal experiences and opinions on the state of agro-processing industry product packaging, key challenges, impacts, benefits, opportunities and future business insights in the field. This study involves audio recording and note-taking of your interview with the researcher. Neither your name nor any other identifying information will be associated with the audio recording or the transcript. Only the research team will be able to listen to the recordings. The research team will transcribe the recordings and erase them once the transcriptions are checked for accuracy. The interview will take us about 30 minutes to complete.

Voluntary Participation

Your participation is entirely voluntary, and you are free to take part or withdraw at any time without any consequences. You may choose to answer some or all of the questions posed.

Confidentiality

Any information you provide will be kept private, and your identity will be kept confidential. None of the information you provide will be used in connection with your name or other identifying information.

Potential Risks

This conversation will not be shared with your employer, colleagues, or anyone outside the small research team. Additionally, the study will not be used to provide individual-level feedback on specific employees or target institutions.

General Information

Can you please introduce yourself, your name, organization, position?

Questions

1. How do you describe the state of agro processing product packaging in Ethiopian context?
2. What role does your institution play in supporting the agro-processing industry?
3. Can you provide an overview of any existing policies or initiatives related to agro-processing product packaging?
4. What are the main challenges faced by the agro-processing industry in terms of packaging?
5. What regulatory or compliance issues impact packaging in the agro-processing sector?
6. What opportunities do you see for improving packaging solutions in the agro-processing industry?
7. How can the government support innovation in packaging for agro-processed products?
8. In your opinion, what is the current demand for innovative packaging solutions in the agro-processing sector?
9. What barriers exist to the adoption of new packaging technologies in the agro-processing sector? How can these barriers be overcome through government support or policy changes?
10. What kind of support (financial, technical, etc.) is needed to implement innovative packaging solutions?
11. What policy measures could enhance the packaging standards in the agro-processing industry? What policies are in place to promote environmentally friendly packaging in the agro-processing sector?
12. How can the government incentivize sustainable and innovative packaging practices?
13. What resources or support services are available for new businesses entering the packaging sector?
14. What packaging standards are currently in place for agro-processed products?
15. What challenges do you foresee in the implementation of sustainable packaging solutions?
16. What future trends in packaging do you believe will impact the agro-processing industry?How is your office preparing for these future trends and innovations?
17. Is there anything else you would like to share about the challenges and opportunities as well as recommendations in agro-processing product packaging?

Thank You Very Much for Your Time!

b. Interview Guide – Agro processing industries

Background

Hello, my name is (name of the interviewer) and I represent Ekuma Consultancy and Training Service Plc. Addis Ababa Chamber of Commerce and Sectoral Associations has

commissioned our firm to undertake a study on Business Opportunities in Agro-processing Industry Product Packaging and prepare a report that feeds policy inputs..

Procedure

The firm will appreciate your participation in this study. If you choose to participate, I will ask you questions about your personal experiences and opinions on the state of agro-processing industry product packaging, key challenges, impacts, benefits, opportunities and future business insights in the field. This study involves audio recording and note-taking of your interview with the researcher. Neither your name nor any other identifying information will be associated with the audio recording or the transcript. Only the research team will be able to listen to the recordings. The research team will transcribe the recordings and erase them once the transcriptions are checked for accuracy. The interview will take us about 30 minutes to complete. The interview will take us about 20 minutes to complete.

Voluntary Participation

Your participation is entirely voluntary, and you are free to take part or withdraw at any time without any consequences. You may choose to answer some or all of the questions posed.

Confidentiality

Any information you provide will be kept private, and your identity will be kept confidential. None of the information you provide will be used in connection with your name or other identifying information.

Potential Risks

This conversation will not be shared with your employer, colleagues, or anyone outside the small research team. Additionally, the study will not be used to provide individual-level feedback on specific employees or target institutions.

General Information

Can you please introduce yourself, your name, organization, position?

Questions

1. General information

- Can you provide an overview of your company's products and services related to the agro-processing industry?
- How long has your company been operating in the agro-processing industry?
- What is the scale of your operations (e.g., small, medium, large enterprise)?

1. **Current packaging practices**

- What types of packaging does your company currently use for agro-processed products?
- What materials and methods are utilized in your current packaging solutions?
- How do you source your packaging materials (locally or imported)?

2. **Challenges and opportunities in packaging**
   - What are the main challenges your company faces with its current packaging solutions?
   - Have you encountered issues related to packaging durability, cost, or sustainability and other issues?
   - What regulatory or compliance challenges affect your packaging practices?
   - What features or innovations would you like to see to enhance your packaging solutions?
   - How important are sustainability, cost-efficiency, and aesthetics in your packaging decisions?
3. **Demand and feasibility for innovative packaging Solutions**
   - What is the demand from your customers for innovative or sustainable packaging?
   - What trends do you observe in the packaging preferences of your customers?
   - How have innovative packaging solutions impacted your business operations and sales?
   - What barriers do you face in adopting new packaging technologies or materials?
   - How open is your company to investing in new packaging solutions?
   - What kind of support or resources would you need to implement innovative packaging solutions?
4. **Business opportunities in packaging**
   - What key factors do you consider when selecting a packaging supplier?
   - Are you interested in collaborating with packaging innovators or startups?
   - Can you provide examples of packaging solutions that have positively impacted your business?
5. **Environmental and sustainability considerations**
   - What eco-friendly or sustainable packaging initiatives have you implemented?
   - What challenges have you faced in implementing sustainable packaging solutions?
6. **Future trends and innovations**
   - What specific packaging innovations are you interested in exploring or implementing?
   - How do you keep up with new developments and innovations in packaging technology?
7. **Feasibility and business development**
   - What factors make new packaging solutions feasible and attractive to your business?
   - What advice would you give to new businesses entering the agro-processing product packaging market?
8. **Other**
   - Are there any additional insights you would like to share about your packaging needs or experiences?

Thank You Very Much for Your Time!

Interview Guide – Packaging industries

Background

Hello, my name is (name of the interviewer) and I represent Ekuma Consultancy and Training Service Plc. Addis Ababa Chamber of Commerce and Sectoral Associations has commissioned our firm to undertake a study on Business Opportunities in Agro-processing Industry Product Packaging and prepare a report that feeds policy inputs..

Procedure

The firm will appreciate your participation in this study. If you choose to participate, I will ask you questions about your personal experiences and opinions on the state of agro-processing industry product packaging, key challenges, impacts, benefits, opportunities and future business insights in the field. This study involves audio recording and note-taking of your interview with the researcher. Neither your name nor any other identifying information will be associated with the audio recording or the transcript. Only the research team will be able to listen to the recordings. The research team will transcribe the recordings and erase them once the transcriptions are checked for accuracy. The interview will take us about 30 minutes to complete. The interview will take us about 20 minutes to complete.

Voluntary Participation

Your participation is entirely voluntary, and you are free to take part or withdraw at any time without any consequences. You may choose to answer some or all of the questions posed.

Confidentiality

Any information you provide will be kept private, and your identity will be kept confidential. None of the information you provide will be used in connection with your name or other identifying information.

Potential Risks

This conversation will not be shared with your employer, colleagues, or anyone outside the small research team. Additionally, the study will not be used to provide individual-level feedback on specific employees or target institutions.

General Information

Can you please introduce yourself, your name, organization, position?

Questions

1. **Company Overview**
   - Can you provide an overview of your company's products and services related to packaging for agro-processed products?
   - How long has your company been in the packaging industry?

- What is the scale of your operations (e.g., small, medium, large enterprise)?

2. **Current packaging solutions**
   - What types of packaging solutions do you offer for agro-processed products?
   - What materials and methods are used in these packaging solutions?
   - How do you source your packaging materials (locally or imported)?

3. **Challenges in packaging**
   - What are the main challenges you face with your current packaging solutions for agro-processed products?
   - Have you encountered issues related to durability, cost, or sustainability?
   - What regulatory or compliance challenges specific to agro-processing products do you face?

4. **Opportunities for improvement**
   - What opportunities do you see for improving packaging solutions for agro-processed products?
   - What features or innovations would you like to enhance your packaging offerings?
   - How important are sustainability, cost-efficiency, and aesthetics in your packaging decisions?

5. **Demand for innovative solutions**
   - What demand have you observed from agro-processing firms for more innovative or sustainable packaging solutions?
   - What trends do you see in the packaging preferences among your clients in the agro-processing industry?
   - How could innovative packaging solutions potentially impact your business operations and sales?

6. **Feasibility of innovations**
   - What barriers do you face in adopting new technologies or materials for packaging?
   - How open is your company to investing in new packaging solutions?
   - What kind of support or resources would you need to implement these innovative packaging solutions?

7. **Supplier selection and collaboration**
   - What key factors do you consider when selecting suppliers for packaging materials or inputs?
   - Are you interested in collaborating with agro-processing firms or startups to develop new packaging solutions?
   - Can you provide examples of packaging solutions that have positively impacted your business or your clients' businesses?

8. **Environmental sustainability**

- How important is environmental sustainability in your packaging choices?
- What eco-friendly or sustainable initiatives have you implemented?
- What challenges have you faced in implementing sustainable packaging solutions?

9. Future Trends and Innovations

- What future trends in packaging do you believe will impact the agro-processing industry?
- Are there any specific innovations you are interested in exploring or implementing?
- How do you stay updated with new developments and technologies in packaging?

10. Feasibility and Business Development

- What factors make new packaging solutions feasible and attractive to your company?
- What advice would you give to new businesses entering the agro-processing product packaging market?

11. Additional Comments

- Do you have any other comments or insights you would like to add regarding packaging needs or experiences?
- Are there any recommendations you can provide for other stakeholders or resources to consult for further insights into packaging challenges and opportunities?

Thank You Very Much for Your Time

07: Contact details

BIC Ethiopia
Impress Hotel & Office Building (3rd floor)
(Near Bole Medhanialem Church)
Addis Ababa

Email: info@bic-ethiopia.eu
Mobile: +251 978 220 194
Website: www.bic-ethiopia.eu

Consortium members:

sequa
Alexanderstr. 10, 53111 Bonn
Germany

Contact person(s):
Oliver Petzoldt, Project Team Leader
Email: oliver.petzoldt@sequa.de
Mobile: +251 (0) 978 220 194

Sabine Schacknat, Project Director
Email: sabine.schacknat@sequa.de
Phone: +49 (0) 228 982 38 – ext. 35

Website: www.www.sequa.de

Addis Ababa Chamber of Commerce
Mexico Square, P.O. Box 2458
Addis Ababa, Ethiopia

Contact person(s):
Dr. Meseret Molla, Secretary General
Email: mesenana_03@yahoo.com
Mobile: +251 (0) 911 206 957

Daniel Dendir, Project Manager
Email: danibechene@yahoo.com
Mobile: +251 (0) 911 795 680

Website: www.addischamber.com

Menschen fûr Menschen
P.O. Box 2568
Adds Ababa, Ethiopia

Contact person(s):
Yilma Taye, Country Director
E: Yilma.Taye@menschenfuermenschen.org
Mobile: +251 (0) 978 220 194

Dr. Sebastian Brandis, CEO
E: sebastian.brandis@menschenfuermenschen.org
Phone: +49 (0) 228 98238 – 35

Website: www.menschenfuermenschen.org

Icehawassa
A8, Hawasssa
Ethiopia

Contact person(s):
Fikir Belete, Project Manager
Email: fikir.belete@icehawassa.org
Phone: +251 (0) 923 577 911

Markos Lemma, Co-founder & CEO
Email: markos.lemma@iceaddis.com
Phone: +251 (0) 912 615 214

Website: www.icehawassa.org

adelphi
Alt-Moabit 91, 10559 Berlin
Germany

Contact person(s):
Mirko Zuerker, Manager
Email: zuerker@adelphi.de
Phone: +49 (30) 89 000 68 - 143

Lina Gutierrez, Analyst
Email: gutierrez@adelphi.de
Phone: +49 (0) 228 98238 – 35

Website: www.adelphi.de

GrowthAftrica
Impress Hotel & Offices Building (3rd floor)
Addis Ababa, Ethiopia

Contact person(s):
Merselu Worku, Growth Catalyst
Email: byo@growthafrica.com
Mobile: +251 911 728 209

Ian Lorenzen, Exec. Director & Partner
Email: ilo@growthafrica.com
Phone: +254 731 51 39 51

Website: www.growthafric