



ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE

LOGISTICS & SUPPLY CHAIN MANAGEMENT
DEPARTEMENT

SUPPLY CHAIN PERFORMANCE ASSESSMENT OF
MALTING INDUSTRY:
THE CASE OF SOUFFLET MALT ETHIOPIA

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INDUSTRY: THE CASE OF SOUFFLET MALT ETHIOPIA

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DECLARATION

I Tesfaye Bedada hereby declare that this thesis titled Supply Chain Performance Assessment of Malting Industry: The case of Soufflet Malt Ethiopia SC is carried out by me with the supervision of Berhanu Denu (Ph. D), Advisor. Any research or academic sources used here in this study is not used or submitted for any educational qualification at this university or any other institution. All the sources materials used in this thesis is properly acknowledged as well.

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LIST OF ABBREVIATIONS/ ACRONYMS

ERP: Enterprise Recourse Planning

GAFSP: Global Agriculture and Food Security Program

ICT: Information and Communication Technology

IFC: International Finance Cooperation

SCM: Supply Chain Management

SCOR: Supply Chain Operation Reference Model

SPSS: Statistical Packages for Social Science

ABSTRACT

This research is to assess Supply Chain performance of malting industry in the case of Soufflet Malt Ethiopia. The study used six supply chain performance variables with each variable measured with specific indicators. The six variables are integration and collaboration with key strategic suppliers, supply chain responsiveness, Supply chain reliability, Supply chain Agility, Operational cost, and warehouse management.

The total population of the study is 300 and using Stratified random sampling techniques 80 respondents used for this study. Descriptive and Explanatory research design is applied and both qualitative and quantitative data collected from the respondents that are directly involving in malt supply chain. Questionnaire and semi structured interview used to collect data. The quantitative data was analysed by using SPSS for descriptive statistics and qualitative data was used to further explain the finding from quantitative data.

The findings of the study show overall Soufflet Malt Ethiopia Supply chain Performance is good in respective to integration with key strategic suppliers, reliability, responsiveness, and Agility. This research also indicate that Soufflet Malt Ethiopia need to work more on cost reduction and warehouse management. Additionally, suppliers are less reliable due to many factors in the ground and further action plan is required to solve this problem in the future. Establishing long term relationship with stakeholders in Malt Barley Supply chain is important.

In conclusion, Soufflet Malt Ethiopia is strong in SC reliability, responsiveness, and Agility. Discussion and Joint planning with suppliers need to be improved.

Keywords: *Supply Chain performance Assessment in the case of Soufflet Malt Ethiopia.*

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CHAPTER ONE

INTRODUCTION

This chapter will present background of the study, statement of the problem, research questions and objectives of the research. It will also deal with the significance, and scope of the study. In addition, it provides brief information as to how the whole thesis will be organized in the end.

1.1. BACKGROUND OF THE STUDY

In today's highly competitive market, establishing and running reliable supply chain is as important as being successful or not. Different tools and techniques are also keep developing to help to measure Supply chain Performances.

Any organization can get a competitive advantage over its competitors through effective and efficient supply chain management. Supply chain management is the basis for all business organizations to compete. It also means supply chain management enables companies even to survive through supply chain effectiveness and efficiency (Hassini, 2008).

Ethiopia is the second-most populous country in Africa with a population of more than 110 million, and agriculture dominates the economy. Agriculture is the major supplier of raw materials to food processing, beverage, and textile industries. In Ethiopia, barley is a major staple food crop and cultivated by small holder famers at altitudes of 1500–3500 m asl and is predominantly grown at 2000–3000m asl mainly in the northern and central regions of the Ethiopia. (MoA, 1998).

In many parts of the world, barley is used to prepare various types of traditional foods and beverages. Barley is also the main grain used for Malt in malting industries. The consumer or buyer of malt is brewery factories which produce beer. The market potential for malt barley is directly dependent on the market for beer; as such, its potential can best be assessed by looking at the evolving dynamics of Ethiopia's growing brewery sector.

Malting is one of the oldest agricultural processes of human history. Malted grains were used in traditional meal made entirely from germinated wheat and barley during ancient times. Malting practices more like the processes used today can

be traced back to around 500 C.E. when malt houses were first constructed. These malt houses used floor malting and natural draft kilning techniques to produce large quantities of malt for brewing and distilling. These practices are still used today, however, the industry has evolved with the

development of mechanical equipment which decreases labor inputs and produces a more consistent product. (Montana, 2018)

Malting can be defined as a process whereby grains are made to germinate by soaking in water and then halted from germinating further by drying with hot air. Malting develops the grain's enzymes which are required to modify the starches into sugars. Malting also develops other enzymes which break down the proteins in the grain into forms that can be used by yeast. The term "malt" refers to several products of the process: the grains to which this process has been applied (for example malted barley), the sugar, heavy in maltose, derived from such grains (such as the baker's malt used in various cereals), and a product based on malted milk, similar to a malted milkshake ([Wikipedia](#))

Brewery Companies is the primary consumer of Malt throughout the globe. The primary driving factors that determine industry profit and management decisions are therefore the price of malt barley grains, cost of malting, demand from beverage manufacturing, market share, and per capita alcohol consumption. In order to control and manage efficient malt barley supply chain is it important to frequently measure Supply chain performance of the industry from integration, collaboration, reliability, agility, and cost minimization perspectives.

Effective and efficient supply chain management helps company to have better collaboration, high efficiency rate, customer satisfaction, reduced overhead cost, high market share, improved cash flow and take comparative advantage in the industry. There is no exception for a company working in malt barley Supply chain as well.

There many stakeholders in Malt barley supply chain. The major players are input suppliers, farmers, traders, commercial farmers, rural assemblers, cooperative unions, grain wholesalers, malt producer factories, government, and breweries. Recently, non-governmental organizations also play some role in supporting malt barley production and marketing for the sake of smallholder farmer supporting. Due to high increase in beer consumption and demand for malt from breweries, the government of Ethiopia is also working in increasing production and productivity of malt barley. This will also save a lot of hard currency invested on importing malt from foreign countries. This can be supported by mechanization of farming, providing improved and high yield varieties and supply of agro chemicals and fertilizer on time with required quantity.

The malting industry is currently supplying malt to brewery industry for local consumption due to growing demand of beer in the country, but it has a great potential to expand its production and enter the export business. Thus, managing the supply chain in the business environment has a major impact on performance of all parties involved in the chain.

About 90% of the total raw material cost for beer production is malt and the material used for malt production in Ethiopia is malt barley. Asela Malt Factory (AMF) was established in 1984 to supply malt to local breweries. The major sources of raw material (malt barley grain) were state farms and producer cooperatives. During the 1980s, cooperatives in the highlands of Arsi were producing malt barley for consumption at the factory (Berhane et al, 2011).

On average, 20% of the malt barley grain supplied to AMF originated from the cooperatives. However, ordinary farmers did not have much information on malt barley marketing and its utilization by the factory. The reason given for this was that cooperatives were not autonomous under the socialist government and there was a top-down planning process that pushed them to produce while discouraging the private sector. Given the same economic policy, state farms were the major producers and suppliers of malt barley at that time. They were supplying about 80% of the total requirements from 1985 to 1989 (Berhane Lake, Hailu Gebre and Fekadu Alemayehu, 1996). After the economic reform of 1990, the cooperatives were dismantled, while the state farms gradually decreased and finally ceased producing barley in 1999/2000. In 1990/91 they supplied 12 204 t of barley, and the following year they supplied about 44% of this volume. Since then, small-scale farmers have come into the picture and become the major suppliers of malt barley (Berhane et al, 2011).

In the last 10 years, farmers have given due emphasis to the production of malt barley in most parts of the highlands of Arsi (CSA, 2000, 2002). The guaranteed market opportunity created as a result of AMF's reliance on private, small-scale farmers for its malt barley supply has sheltered the farmers from price fluctuations at times when there was instability in the grain market, and eventually triggered competition for the product in the market.

Few years ago, Gonder malt factory established to supply malt to Dashen Brewery and companies like Heineken and BGI contacted Group Soufflet and Boort Malt to build their factory in Ethiopia.

1.2. STATEMENT OF THE PROBLEM

Currently, Ethiopia has experienced one of the fastest increases of beer consumption in recent years, with consumption rates steadily rising from 15 to 20% every year since 2011 (Molla, 2016). Much of Ethiopia's beer demand is currently being met by domestic brands and international and local malting and breweries companies are opening their branch in Ethiopia and investing huge amount of money for this growing industry.

This growth in beer demand directly attracted top international malt industries like Soufflet and Boortmart to Ethiopia. Both companies are among top three operators in malting industry worldwide and mainly in Europe. Soufflet Malt Ethiopia built its factory inside Bole Lemi Industrial park with a potential of 800,000 quintals of malting per year and Boort Malt located its factory in Debre Birhan with the potential of 600,000 quintals malting capacity. In addition to malting industry, brewery factory is also expanding and companies like United Beverages are also joining the industry.

Additionally, most of existing major brewery companies like Heineken, BGI, DIEGO and Habesha are investing more to open new branches and to meet their customers' demand with new products and improving supply chain efficiency.

International donors and financial company are also investing a lot in this sector. Among few investments, International Finance Corporation (IFC) has extend \$55.9 million financing to Habesha Breweries S.C., a beverage manufacturer in Ethiopia to help the company expand its operations and increase local barley sourcing from smallholder farmers.

According to IFC, Ethiopia's brewing industry is fast growing and an important contributor to economic growth, but the sector imports as much as 70% of its malt barley needs ([Africa Agri Business, 2019](#))

Groupe Soufflet, one of the largest malting groups in the world, has received a EUR 20 million backing from International Finance Corporation (IFC), a member of the World Bank Group, for their greenfield project in Ethiopia. The investment involves both IFC and the Global Agriculture and Food Security Program (GAFSP) to which IFC serves as the private sector window investing EUR 10 million each, to enlarge the production capacity of Soufflet Malt Ethiopia. ([Inside Beer, 2019](#))

As a result of increasing number of malting and brewery companies in the last decade following the growing demand of beer in the country, competition for main inputs are becoming tough and extra efforts are required from companies. Following the reports of international organizations like IMF

and World Bank on the development and the fast-economic growth of the country, direct foreign investment is increasing, and the government of Ethiopia also opens the beverage industry to foreign investors.

Therefore, studying supply chain performance of malting industry is very important not only for malting but also for brewery companies and international actors. According to some primary information collected malting companies including the case company are challenged by inconsistent malt barley supply chain mainly based on traders, unions, and farmers with low quantity of malt barley available in the market. Some information also indicates this companies are not able to fill their malt barley grain demand to operate their factory through the year and are considering importing grain from abroad.

As indicated above, the competition for collecting malt barley grain from producers and managing the supply chain performance efficiently is becoming high. This needs high level of responsiveness, flexibility, reliability, collaboration, and efficiency in warehouse management. There is a knowledge gap how well is the performance of supply chain in this industry and this thesis focus on assessing malting industry supply chain performance from integration and collaboration with supplier, responsiveness, reliability, agility, cost, and warehouse management perspectives.

There is also limited research on malting and brewery industry in general and this is the first research on newly operating Soufflet Malt Ethiopia. Therefore, this thesis will fill the knowledge gap in the subject of this topic in this competitive industry and convinced this researcher to a large extent to incline for conducting on this topic of research.

1.3. RESEARCH QUESTIONS

The basic questions to answer by conducting a research is the following:

- How reliable is supply chain management performance of Soufflet Malt Ethiopia?
- How responsive is supply chain management performance of Soufflet Malt Ethiopia?
- How agile is supply chain management performance of Soufflet Malt Ethiopia?
- What are the Warehouse Management and operational cost efficiency of Soufflet Malt Ethiopia?
- What is the level of integration and collaboration between Soufflet, its Suppliers and customers?

1.4. OBJECTIVE OF THE STUDY

1.4.1. General Objective of the Study

The general objective of this study is to investigate and measures supply chain performances of the case malt producing company operating in different zones of Oromia and with its factory located in Addis Ababa. It will also try to fill the gaps in literature on this specific industry and create better insight about the supply chain operations of malting industry.

1.4.2. Specific Objectives of the Study

The specific objectives of the study are:

- To measure the supply chain reliability of Soufflet Malt Ethiopia?
- To measure the responsiveness of the supply chain in Soufflet Malt Ethiopia?
- To measure the flexibility of the supply chain of Soufflet Malt Ethiopia?
- To determine the cost effectiveness of the Soufflet Malt Ethiopia?
- To measure warehouse management of Soufflet Malt Ethiopia?

The supply chain performance assessment variables are supply chain responsiveness, agility, operational cost and warehouse management performances, collaboration and integration with suppliers and customers, and upstream collaboration.

1.5. SIGNIFICANCE OF THE STUDY

Effective and efficient supply chain management creates value to supplier, customer and all supply chain actors in this industry and enables the supply chain firms to maintain or gain competitive advantages over their competitors. Measuring Supply chain performance of a company will help to increase the competitiveness of the company in the market and in the industry.

This study will have significant role for any malting company to understand the major Supply chain performance matrix with its challenges and opportunities.

Besides, in the growing brewery industry where malt is the main input, being strong competitor in the market as a supply chain network rather than as a single factory is very important and mandatory. Therefore, assessing malting industry performance will help the case company to identify the key challenges, plan improvement actions and fill the gaps for better efficiency and performance. Conducting a research on supply chain performance and identifying gaps in malting industry will

provide useful information for the actors in the supply chain, the academia, policy makers, and finally contribute to the existing literature.

The result of the study will also give an insight into the performance of other supply chain partners like malt barley grain suppliers, transporters, breweries, and input suppliers in the chain of the case company malting industry and review their performance own supply chain performance excellence.

Government and other stakeholders working in malt barley supply chain can use this paper as reference and policy inputs.

1.6. SCOPE OF THE STUDY

The scope of this study is limited to the case Soufflet Malt Ethiopia company which is operating in malt barley grain collection in Oromia region and malting factory located in Addis Ababa.

The study will focus on the upstream supply chain performance of case company. The supply chain variables will be the reliability of malt barley supply chain, responsiveness, flexibility, cost and asset management performances, collaboration and integration with suppliers and customers, and upstream collaboration. Green Supply chain and Supply chain human resource are not included.

1.7. LIMITATION OF THE STUDY

Like any study this study will have the following limitations. The study only focuses on limited supply chain performance variables mentioned above and upstream supply chain actors participating in malting industry.

1.8. ORGANIZATION OF THE STUDY

This study will be organized in five chapters. Chapter one will be on the background of the study, statement of the problem, research questions, objectives of the study, significance of the study, scope of the study, limitations of the study, definition of terms and organization of the study. Chapter two will cover literature review of supply chain management performance and related topics important for this study. Chapter three will cover research methodology. Results and findings will be discussed on chapter four. Finally, chapter five will be all about the summary, conclusions, and recommendations.

CHAPTER TWO

2. RELATED LITERATURE REVIEW

This Chapter of the thesis present literature review from theoretical, empirical, and conceptual perspectives. It also deals with key focus areas like supply chain strategy, Supply chain performance, Supply chain integration & collaboration.

2.1. THEORETICAL LITERATURE REVIEW

2.1.1. What is Supply Chain?

Different scholars and literatures define supply chain in many ways, and all agree on the importance of Supply chain. This discipline is becoming more and more important for companies to make decision, measure their performance and stay competitive and effective in their business. Some of the definition of Supply chain selected for this research paper is as follows.

Supply Chain as life cycle processes involving physical goods, information, and financial flows whose objective is to satisfy end consumer requisites with goods and services from diverse, connected suppliers (Ayers (2001). In its definition it mainly focuses on the three main follow items: Goods/Service, information, and Money.

Supply chain is a linkage of various organizations and the chain comprises producers or vendors that supply raw materials, producers who convert the raw material into finished product, warehouses that store products, distributor's that deliver products to retailers and retailers who deliver products to the ultimate consumer through upstream and downstream linkages in different kinds of activities and processes (Christopher,1998). This definition mainly targets the stakeholders of supply and material and service movement.

Finally, Dr. Dawei LU (2011) define Supply chain as a group of inter-connected participating companies that add value to stream of transformed inputs from their source of origin to the end products or services that are demanded by the designated end customers.

2.1.2. What is Supply Chain Management

Supply Chain Management is a network of facilities that produce raw materials, transform them into intermediate goods and then final products, and deliver the products to customers through a distribution system. It spans procurement, manufacturing, and distribution. The basic objective of supply chain management is to “optimize performance of the chain to add as much value as possible

for the least cost possible”. In other words, it aims to link all the supply chain agents to jointly cooperate within the firm as a way to maximize productivity in the supply chain and deliver the most benefits to all related parties (Rajendra Kumar Shukla et al. , 2011)

Supply chain consists of three or more organizations or individuals that are directly involved in the upstream and downstream flow of demand information, cash, products, and services (Mentzer, 2001).

Supply Chain Management is a set of approaches that efficiently integrate and coordinate the materials, information and financial flows across the supply chain so that merchandise is supplied, produced and distributed in the right quantities, to the right locations, and at the right time, in the most cost-efficient way, while satisfying customer requirements(Hugo, et.al, 2011).

Supply Chain Management is management of material, money, men, and information within and across the supply chain to maximize customer satisfaction and to get an edge over competitors.

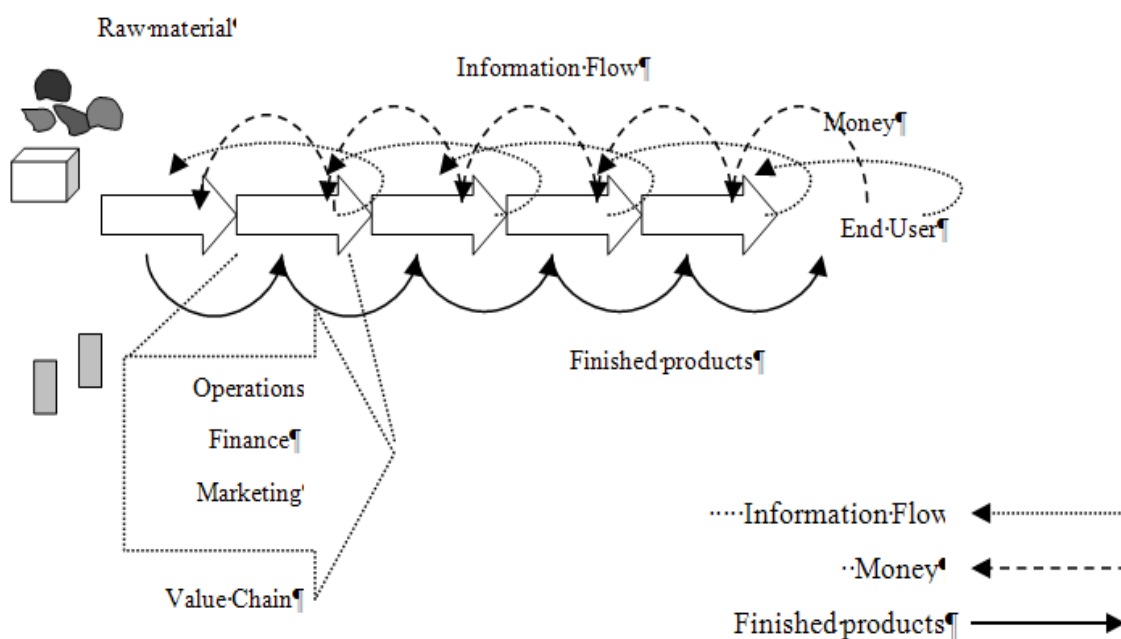


Figure 1: Supply Chain (New and Payne, 1995)

The above figure explains Supply Chain Management as a management of material, money, men, and information within and across the supply chain to maximize customer satisfaction and to get an edge over competitors. The follow of Money and Information continue from Suppliers of Suppliers to consumers of consumer.

2.1.3. Evolution of Supply Chain Management

In the 1950s and 1960s, most manufacturers emphasized mass production to minimize unit production cost as the primary operations strategy, with little product or process flexibility. In the 1970s, material requirements planning (MRP) was developed and managers realized the impact of huge WIP inventories on manufacturing cost, quality, product development, and delivery lead-time. The intense global competition of the 1980s forced world-class organizations to offer low-cost, high-quality, and reliable products with greater design flexibility. (Rajendra Kumar Shukla et al, 2011)

Manufacturers utilized Just-In-Time (JIT) and other management programs to improve manufacturing efficiency and cycle time. The evolution of SCM continued into the 1990s as organizations further extended best practices in managing corporate resources to include strategic suppliers and the logistics function. Many manufacturers and retailers are embracing the concept of SCM to improve efficiency and effectiveness across the supply chain.

The following table explain the evolution of supply chain management.

Table 1: Evolution eras of supply chain management (Jain et. al. 2010)

S/N	ERA	Description
1	Creation Era	The term supply chain management was first coined by an American industry consultant in the early 1980s. However, the concept of supply chain in management, was of great importance long before in the early 20th century, especially by the creation of the assembly line.
2	Integration Era	This era of supply chain management studies was highlighted with the development of Electronic Data Interchange (EDI) systems in the 1960s and developed through the 1990s by the introduction of Enterprise Resource Planning (ERP) systems.
3	Globalization Era	This era is characterized by the globalization of supply chain management in organizations with the goal of increasing competitive advantage, creating more value-added, and reducing costs through global sourcing
4	Specialization Era phase One- Outsourced manufacturing and distribution	In the 1990s industries began to focus on “core competencies” and adopted a specialization model. Companies abandoned vertical integration, sold off non-core operations, and outsourced those functions to other companies.
5	Specialization Era phase Two - Supply Chain Management as a service	Specialization within the supply chain began in the 1980s with the inception of transportation brokerages, warehouse management, and non-asset-based carriers and has matured beyond transportation and logistics into aspects of supply planning, collaboration, execution and performance management.
6	Supply Chain Management 2.0 (SCM 2.0)	Web 2. 0 is defined as a trend in the use of the World Wide Web that is meant to increase creativity, information sharing, and collaboration among users.

2.1.4. Supply chain management objectives

The main reason and objective of SCM is to provide a strategic weapon to build up and enhance sustainable competitive advantage by cost reduction without compromising customer satisfaction (Mentzer et al. 2001).

Moreover, the ability to understand the environment pressures that drive the SCM and clearly note the barriers, and implement solutions or bridges enables supply chain performance to maintain competitive advantage. The main goal and important aspect of SC is leveraging the expertise, experience, skills, and capabilities of the SCP who comprise this competitive network (Mentzer et al., 2001).

2.1.5. Supply Chain Strategy

A supply chain strategy aims to determine the benefits of operation, distribution, services, and all activities an organization is using based on specific strategy. A supply chain strategy is part of the overall business strategy, designed around a well-defined basis of competition (innovation, low cost, service, quality) (Hugo, Badenhorst-Weiss & Van Biljon, 2011: 22).

Implementing appropriate supply chain strategy enables to achieve a better supply chain performance in terms of responsiveness and efficiency over that of rivalries in each industry. It is integrated with the marketing strategy, customers' needs, the product strategy, and power position (Hugo et al., 2011: 22; Hines, 2006: 33).

There are two generic strategies in supply chain management, namely the lean and agile strategies (Hull, 2005; Simons & Zokaei, 2005; Hallgren & Olhager, 2009; Pandey & Garg, 2009; Vinodh, Sundararaj & Devadasan, 2009). Here, 'leanness means developing a value stream to eliminate all waste, including time, and to enable a level schedule', while 'agility means using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile marketplace' (Manson-Jones et al., 2000: 54). Both are important for implementing the strategy or a combination of both which is called leagile supply chain. Some writer like Towill and Christopher suggested that basically, there are three different supply chain strategies. They are lean, agile and a combination of lean and agile hybrid supply chain strategies. (Towill& Christopher, 2002; Raturi & Evans, 2005)

2.1.6. Supply Chain Operation Reference (SCOR) model

Present day supply chains are inherently complex and involve multiple companies working simultaneously within a single function and rivalry is such that it's a competition not between companies but between supply chains. This ever-growing complexity and increased involvement of multiple stakeholders in the supply chain pointed out the need for a universal framework for measuring performance and benchmarking, thus resulting in the Supply Chain Operations Reference (SCOR) Model. Globally significance of SCOR for benchmarking, performance measuring and business process re-engineering had been recognized long time back.

The Supply Chain Operations Reference model (SCOR®) is the product of Supply Chain Council, Inc. (SCC) a global non-profit consortium whose methodology, diagnostic and benchmarking tools help organizations make dramatic and rapid improvements in supply chain processes. SCC established the SCOR process reference model for evaluating and comparing supply chain activities and performance. The SCOR-model captures SCC's consensus view of supply chain management. It provides a unique framework that links business process, metrics, best practices, and technology into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities. (Supply Chain Operations Reference Model Revision 11.0)

2.1.7. SCOR Performance

The performance or metrics section of SCOR focuses on understanding the outcomes of the supply chain and consists of two types of elements: Performance Attributes and Metrics and introduces the concept of Process/Practice Maturities.

A performance attribute is a grouping or categorization of metrics used to express a specific strategy. An attribute itself cannot be measured; it is used to set strategic direction. Metrics measure the ability to achieve these strategic directions. SCOR recognizes 5 performance attributes:

- Reliability
- Responsiveness
- Agility
- Cost
- Asset Management Efficiency (Assets)

TABLE 2: The SCOR Performance Attributes Metrics and Definition

Supply Chain Performance Variables /Characteristics	Definition
Reliability	The ability to perform tasks as expected. Reliability focuses on the predictability of the outcome of a process. Typical metrics for the reliability attribute include: On-time, the right quantity, the right quality.
Responsiveness	The speed at which tasks are performed and finished . The speed at which a supply chain provides products to the customer. Examples include cycle-time metrics.
Agility	The ability to respond to external influences, the ability to respond to marketplace changes to gain or maintain competitive advantage. SCOR Agility metrics include Flexibility and Adaptability.
Costs	The cost of operating the supply chain processes. This includes labour costs, material costs (input cost), management, Sourcing cost and transportation costs. A typical cost metric cost of raw materials
Asset Management Efficiency (Inventory Management).	The ability to efficiently utilize assets. Asset management strategies in a supply chain include inventory reduction and in-sourcing vs. outsourcing. Metrics include: Inventory days of supply and capacity utilization.

SCOR Model Version.12 (2017)

Reliability, Responsiveness and Agility are customer/Supplier-focused performance characteristics. Cost and Asset Management such as warehouse efficiency are internal-focused performance characteristics. Each performance attribute has one or more strategic performance metrics as indicated in the above table. SCOR supply chain processes are unique processes a supply chain requires to execute to support its primary objective to fulfil customer orders. SCOR model provides

a set of processes most companies perform to effectively execute their supply chains. The six macro-level SCOR processes: Plan, Source, Make, Deliver, Return and Enable are well-known and widely adopted.

A metric is a standard for measurement of the performance of a supply chain or process. SCOR metrics are diagnostic metrics (compare to how diagnosis is used in a medical office). SCOR recognizes three levels of pre-defined metrics:

Level-1 metrics are diagnostics for the overall health of the supply chain. These metrics are also known as strategic metrics and key performance indicators (KPI). Benchmarking level-1 metrics helps establishing realistic targets to support strategic directions.

Level-2 metrics serve as diagnostics for the level-1 metrics. The diagnostic relationship helps to identify the root cause or causes of a performance gap for a level-1 metric.

Level-3 metrics serve as diagnostics for level-2 metrics. The analysis of performance of metrics from level-1 through 3 is referred to as metrics decomposition, performance diagnosis or metrics root cause analysis. Metrics decomposition is a first step in identifying the processes that need further investigation. (Processes are linked to level-1, level-2, and level-3 metrics).

SCOR Process



Figure 2 SCOR's six major management processes. Source: SCOR MODEL, Version.12 (2017).

2.1.8. SCOR Structure

SCOR is a process reference model. The purpose of a process reference model, or business process framework, is to define process architecture in a way that aligns with key business functions and goals. Architecture here references how processes interact and perform, how these processes are configured, and the requirements (skills) on staff operating the processes.

The SCOR reference model consists of 4 major sections:

- Performance: Standard metrics to describe process performance and define strategic goals
- Processes: Standard descriptions of management processes and process relationships
- Practices: Management practices that produce significant better process performance
- People: Standard definitions for skills required to perform supply chain processes.

2.1.9. SCOR Performance

The performance section of SCOR focuses on the measurement and assessment of the outcomes of supply chain process execution. A comprehensive approach to understanding, evaluating, and diagnosing supply chain performance consists of three elements: Performance Attributes, Metrics, and Process / Practice Maturity. Elements, as distinct from the Levels in the Process and Metrics hierarchies, describe different aspects or dimensions of performance:

- Performance Attributes: Strategic characteristics of supply chain performance used to prioritize and align the supply chain's performance with the business strategy
- Metrics: Discrete performance measures, themselves comprised of levels of connected hierarchy
- Process/Practice Maturity: Objective, specific descriptions used a reference tool to evaluate how well supply chain processes and practices incorporate and execute accepted best-practice process models and leading practices.

2.1.10. Supply Chain Integration and Collaboration

Supply Chain Integration and Collaboration, one of the variables that determine Supply chain performance, is defined in many ways. Collaboration occurs when companies in the chain set common goals and work jointly to achieve the common goal of supply chain performance and value to the customer (Holweg et al, 2015).

Collaboration can be conceptualised as a strategy, a unique dynamic capability and the highest form of long-term, trust-based relationship; it is characterised by joint planning and decision-making regarding strategic and operational matters, resource, process, information and risk sharing and mutual understanding, working towards shared goals and achieving optimal solutions (Soosay and Hyland, 2015).

Resources (Goods and services), money and information are exchanged between the chain partners. Risks, profits, and losses are shared fairly among the chain members (Hardy & Philips, 1998).

In the SC, it goes beyond mere integrating information between customers and their suppliers, and includes strategic joint decision making among the collaborators in the aspects of collaborative forecasting, distribution, planning, network design, product design, and partnerships (McLaren, et al. 2002).

2.1.11. Types of Supply Chain collaboration

A variety of forms of collaboration are relevant in the context of network competition. These forms of collaboration can be divided into three categories: vertical, internal, and horizontal.

A. Vertical SCC Collaboration

Vertical collaboration includes collaboration between customers, internal functions, and suppliers (Barratt, 2004). Vertical collaboration is the collaboration when two or more organizations from different levels or stages in supply chain share their responsibilities, resources, and performance information to serve relatively similar end customers (Simatupang & Sridharan, 2008).

B. Internal Collaboration

Initially and perhaps most importantly is the issue of internal collaboration. It refers to the integration of various internal interfaces, e.g. marketing and logistics (Ellinger, 2000), purchasing and manufacturing (Fawcett 2008).

C. Horizontal Supply Chain Collaboration

The third type of Collaboration is Horizontal collaboration which is the relationship between competitors and other supply chain actors. Horizontal integration is one of the supply chain collaboration strategies and it is used when two or more unrelated or competing organizations cooperate to share their private information or resources (Deshumkh, 2010).

As there is a lot of malt barley supply chain competitors, this type of collaboration is also important. As an example, there are two platforms directly related to this supply chain: Malt Barley Supply Chain Platform and Malteries Association.

TABLE 3: Three levels of customer-supplier relationship (Jonsson, 2008, p. 184)

	Level of Company-Supplier Relationship	Description
1	Partnership suppliers	• Strong Long –term relationship exists. • The highest possible level of relationships with suppliers. • Relationship also includes joint product development, regular exchange of information on products, delivery, inventory, demand forecast, price, and quality issues.
2	Associated suppliers	• Relationships are long term and reviewed periodically. • Suppliers guarantees quality of supplies and no need to carry out quality controls on deliveries.
3	Conventional Suppliers	• Lower level relationship due to single order. • Price is one of the selection criteria. • Low frequency and the evaluation and selection takes place for each transaction and common work

2.1.12. Significance of Performance Evaluation:

Performance measurement is very important as a strategic tool and provides means to achieve the objectives required, fulfilling a firm's mission/strategy statement. Many firms have been observed to evaluate performance, primarily on the basis of cost and efficiency (Skinner, 1971). This has resulted in most measures focusing on financial data such as return on investment, return on sales, price variances, sales per employee, productivity, and profit per unit production etc.

The literature reviewed so far highlights the importance of managing the design and development of performance measurement systems to ensure that they continue to show the environment, goals, and objectives of the organization. The literature also suggests that the factors affecting evolutionary change within organizations, and hence the evolution of performance measures, are many and complex.

Effectively measuring and managing of supply chain performance is a complex and difficult task. If performance measurement is to lead to long-term and continuous performance improvement, then different stages of the performance measurement and management processes such as design of measurement systems, their implementation, and identification of appropriate measures to be used are to be successfully implemented.

Organizational support in terms of knowledge sharing, leadership, structure, and learning is immensely required for successful implementation (Rajendra Kumar Shukla et al, 2011)

2.2. EMPIRICAL LITERATURE REVIEW

2.2.1. RESEARCHS ON MALT BARLEY MARKETING IN ETHIOPIA

In the views of Bedada et al (2014), the increases in number of breweries and their expansion currently and in the future indicates the demand for malt barley product in the future. Research on barley) improvement has produced substantial amount of technologies , information, and knowledge, and on Producing. More efforts are also underway for the extension of improved technologies to the farmers. These all together shows the opportunities for barley production improvement in the future.

Watabaji, et al, 2016 examined the interplay between value chain integration dimensions and value chain performance along the malt barley value chain in Ethiopia. The analyses were based on survey data sets obtained from 320 farmers and 100 traders and qualitative interview responses captured from 62 key informants selected from among members of the chain. The structural equation modelling (SEM) technique was employed to seek answer for the question of how value chain integration dimensions are related to performance. The results of the analyses showed the existence of positive relationships between coordination of activities and performance, and between joint decision-making and performance at farmers-cooperatives interface; and between commitment towards long-term relationships and performance at farmers- traders interface. The study has made important empirical contributions in areas of value chain integration and performance and their interplays within the context of the studied malt barley value chain. The key findings of the study make important policy implications for agribusiness value chains in the developing countries. (Watabaji, et al, 2016)

Addisu Bezabih in his research titled Malt barley commercialization through contract farming scheme: A systematic review of experiences and prospects in Ethiopia investigated emerging trends

of contract farming scheme to be adopted as one of the potential pathways for smallholder commercialization in the country. Common indicators of commercialization such as market orientation, participation in both inputs and outputs, expansion of cultivation areas, and adoption of technologies (varieties, fertilizer, etc.,) are observed along malt barley contract farming scheme. Following beer companies' privatization and enhanced working capacity, and malt demand increased by 83%. As result, malt barley contract farming scheme introduced by Heineken/chord to ensure local sourcing of malt barley by integrating large number of farmers to the value chain. The malt barley contract farming scheme observed as driver of smallholder commercialization showcase of firm farmer integration and agricultural transformation in the country. This is since contract farming is an emerging institutional innovation in Ethiopia linking farmers to reliable market, open access to inputs, technology and advisory services that lead to improved productivity, production, and income. Specifically, malt barley contract farming scheme is an innovative platform harbouring public private partnership, the malting industry managed to secure 55% of the requirement from local sources. Contracted farmers take a 10% higher price for malt barley than non-contracted food barley producer counterparts due to high yielding varieties productivity advantage from same parcel of land, similarly, malt factories are integrated and benefiting from processing local raw material (Addisu Bezabih, (2018).

Studies on recent progress of malt barley contract farming scheme in Ethiopia report the following finding. The findings include: thousands of farmers are contracted to Heineken, Diego and Dashen breweries and Asela and Dashen malt factories; farmers positively responding to malt barley market signals, farmers are motivated to profit maximization, areas under malt barley cultivation growing, considerable areas are specializing in malt production using emerging comparative advantages. These phenomena occurring in the malt barley value chain leads to make certain important conclusions in terms of the smallholders' market orientation, participation both in input and output markets and growing income imply that malt barley is commercialized to considerable level. However, there are still some challenges in the organization and operation of the contract farming schemes; along fulfilling malt barley requirement from local sources. Astonishingly, the impact of farm-farmer business integration reported to be very high for farmers while the impact on the firm is high but at high costs. That benefit imbalance was reported from the firm side that local malt barley production cost is higher than importing costs. Sustaining the success of malt barley firm-farmer business scheme, depends on strengthening performances of the interfaces of the intermediaries such as primary cooperatives, unions, microfinance institutions, research institutes, agricultural offices, donors, and facilitator projects operating between farmers and the firm. It was observed that primary

cooperative, unions, etc, perform at different capacity, some at remarkable level while others fail to perform desired role accordingly (Addisu Bezabih, (2018).

Within most of the produce is contributed through traders (51.78%) followed by primary cooperatives (36.24%) and farmer traders (11.98%). Primary cooperative channel about 78.4% of what they have collected to unions, 11.5% to breweries, and the rest 9.7% to AMF. Similarly, the major proportion of malt barley from unions is channelled to Breweries (78%) and the rest 22% to AMF. Farmer traders that have a capacity of producing on own farms considerable volume and who can buy from fellow farmers channel to breweries as per their contract arrangement with respective brewery i.e. to Heineken, which has a contact arrangement with selected farmers, traders. AMF often buys from traders, who are engaged in malt barley trade. (Dawit Alemu, et al, 2015)

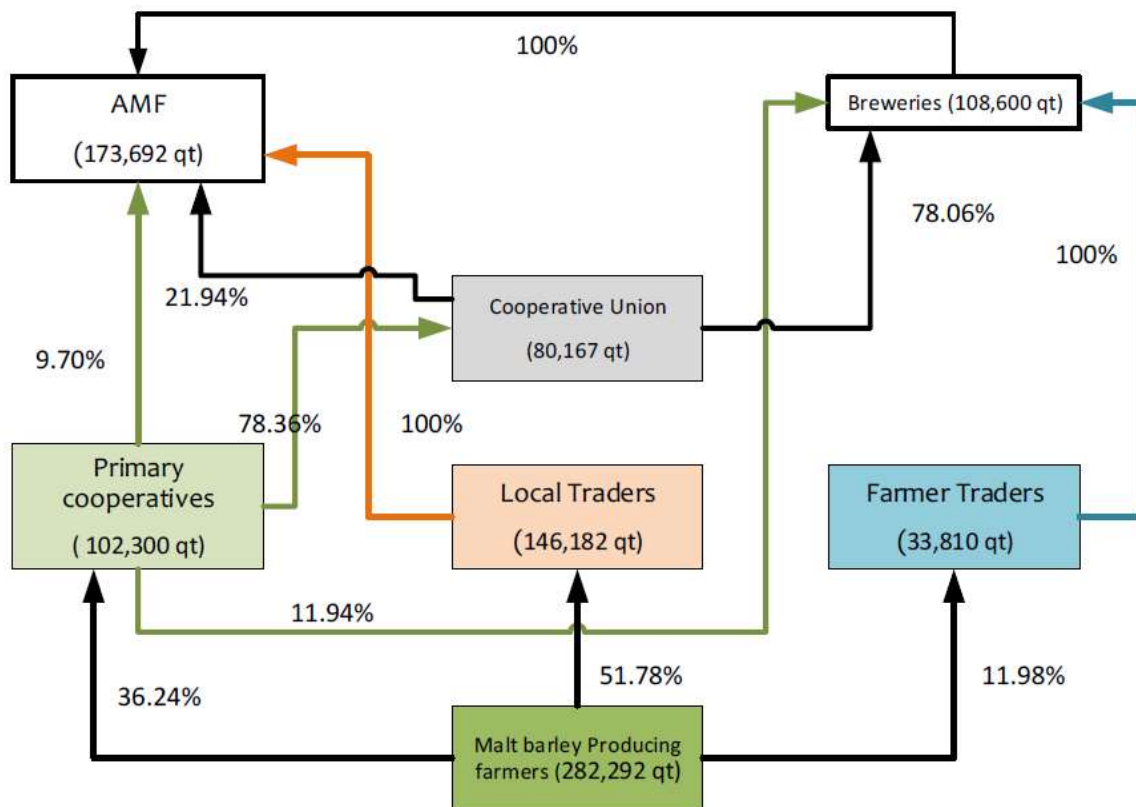


Figure 3: The formal malt and brewery industry marketing channel of malt barley in Arsi and West Arsi zones of Oromia, Ethiopia.

Source: Dawit Alemu, et al, 2015

Study by Mulugeta D. Watabaji in 2015 identified variations among malt barley value chain members in terms of the quantity and quality of information generated and shared with other chain members.

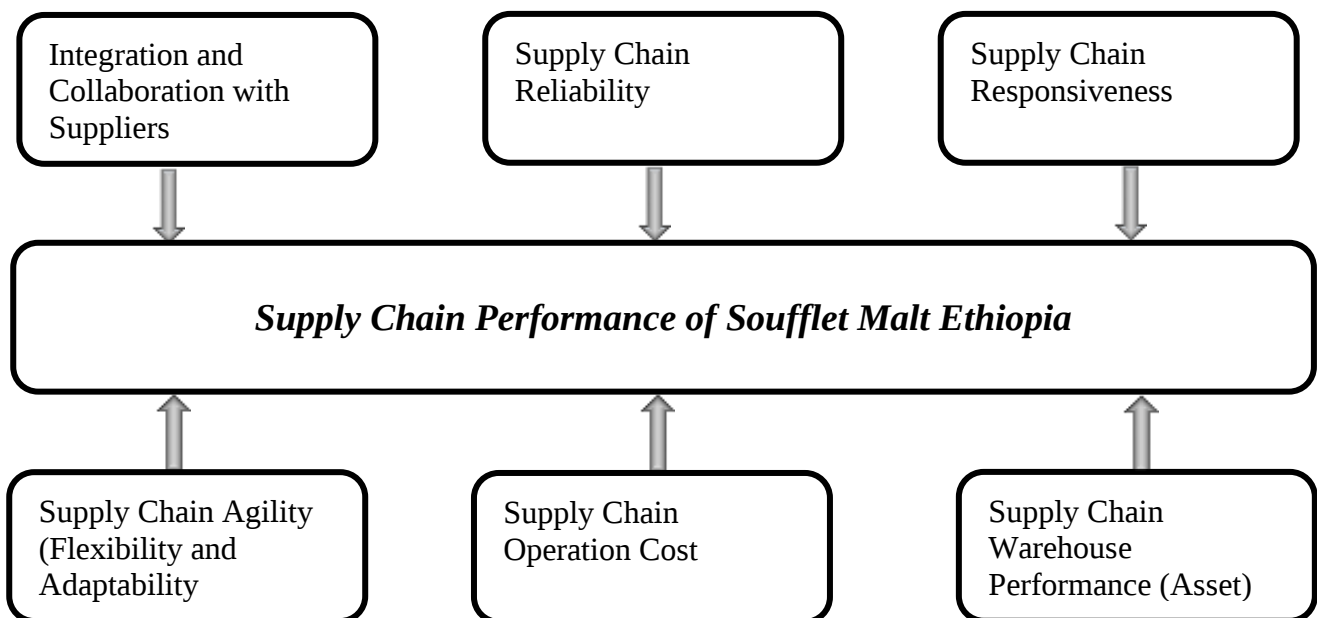
The upstream members of the malt barley value chain have less information and the situation improves as one moves down along the chain.

The variation in the level of information generated mainly results from members' variations in terms of capacity to generate information and access to information sources. For instance, farmers and cooperatives have less information than any other members due to limited information generating capacity and less access to information sources. Breweries and the malt factory are less willing to share information on product specifications to upstream members though it is quite useful for decision making.

The study identified several fragmentations in the MBVC structure that have contributed to the weak integration and low performance of the chain. The quality of malt barley produced is far below the required standard. Cooperative organizations are poorly structured to make bulk collection of malt barley. Traders are extensively engaged in the adulteration of good quality malt barley with poor ones to serve their egoistic profit desires. The level of collaboration among members on malt barley seeds development is minimal. This study has provided a conceptual framework that can be replicated in other similar studies with reference to agricultural value chains in developing countries for better generalizability of the findings. This study also provides important managerial insights concerning the structure, integration, and performance of the malt barley value chain. The disperse geographic locations of members, poor flows of information along the value chain, the use of ineffective transaction governance mechanism, weak cooperatives organizations, ineffective agricultural research system and absence of common platform for members dialoguing are some of the factors that contribute to weak integration and low performance of the malt barley value chain that its members and stakeholders should work on to improve and sustain chain's integration and performance. (Mulugeta D. Watabaji, 2015)

2.3. CONCEPTUAL FRAMEWORK

The study mainly relies on the SCOR model framework. SCOR is a supply chain process reference model containing over 200 process elements, 550 supply chain performance metrics, and 500 best practices. The Supply Chain Operations Reference model (SCOR) is the world 's leading supply chain framework, linking business processes, performance metrics, practices and people skills into a unified structure. SCOR is organized around the six primary supply chain management processes of Plan, Source, Make, Deliver, Return and Enables, and five core supply chain performance attributes or characteristics: Reliability, Responsiveness, Agility, Costs, and Supply Chain Asset Management Efficiency. The researcher tried to analyse and assess the performance of supply chain in terms of Reliability, Responsiveness, Agility, Costs, and Supply Chain Asset Management Efficiency, collaboration with upstream partners and SCOR best practices as shown in the diagram below.



Source: Self

Figure 4: The conceptual framework of SCM indicators for the study

Macro and Micro factors affect supply chain performance of a malting industry. This conceptual framework is to assess Supply chain performance of Soufflet Malt Ethiopia using SCOR Metrics on the major activity of the company.

As you can see from the figure , this study assesses Supply Chain Performance of Malting Industry in the case company from 6 major variables. This are Integration and Collaboration with Suppliers, Supply Chain Flexibility, Supply Chain Reliability, Supply Chain Responsiveness, Supply Chain Agility, Supply chain Operation cost and Warehouse Performance (Asset Management)

CHAPTER THREE

METHODOLOGY

In this chapter the research design and methodology used in the study is described. The geographical area where the study conducted, the research design, the research approach, the subject of the study, the case companies, the participants of the study, the type of data source, the type of research, the research instrument used to collect the data, the methods of data collection, method of data analysis, validity and reliability of the instrument, ethical.

3.1 DESCRIPTION OF THE STUDY AREA

The Soufflet Group is a French family-owned business based on collecting and adding value to agricultural raw materials. It is the top private France's private cereal collector; the Group is also a major player in supplying inputs to farmers cultivating various field crops and wine yard. It was established 100 years ago. Internationally it works on Wheat supply chain, Barley supply chain, Rice and pulses supply chain and Agriculture, and market.

In barley, it is a front-rank world player on the malt market with 28 malt plants in Europe, Latin America, Asia, and Africa, located at the main area of the barley producing regions.

Varietal selection research and Development, seed multiplication, choosing the best quality barley for its malt plants and the precision of its manufacturing process all enable Soufflet to produce the finest malt for its brewer customers. It has started its operation in Ethiopian in 2017 and is setting up a manufacturing unit and the associated value-chain. By setting a first foot in Africa, this ambitious project is fully in line with the strategy of Malteries Soufflet to develop activities outside Europe which already include Brazil, Argentina, and India. ([Soufflet, 2021](#))

In Ethiopia the company is known by the name of Soufflet Malt Ethiopia SC.

Ethiopia is the largest barley producer in Africa and the fourth largest beer maker on the continent, where the market is fast expanding. The malt plant located inside Bole Lemi Industrial Park in Addis Ababa, close to many of the barley fields in the country.

Currently, Soufflet Malt Ethiopia collects malt barley grain mainly in barley producing Oromia region by locating rented warehouse in Adama, Asela, Shashemene, Dodola and other areas like Ambo.

Soufflet works with different stakeholders in the malt barley supply chain and breweries. It starts from malt barley producing farmers to brewery company like Heineken, Habesha, BGI and including governmental and non-governmental organizations like EUCORD, Oromia Seed Enterprise and woreda to federal government office mainly agriculture.

The main customer of this company is Heineken and BGI brewery which are the top actors in beer industry in Ethiopia.

3.2 RESEARCH APPROACH

There are three research approaches: qualitative, quantitative, and mixed methods. Mixed research methods used when to incorporate elements of both qualitative and quantitative approaches. It also makes the findings more reliable. Mixed research design is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone. Creswell (2013).

Qualitative techniques including focus group discussion, key informant semi structured interviews and unstructured in-depth interviews will be used for data collection. Quantitative researches as a formal, objective, systematic process will be used to describe and test relationships and examine cause and effect interactions among variables. Surveys will be used for exploratory research. A survey will be used to collect original data for describing a population too large to observe directly. A survey obtains data from a sample of the population and infers that the population had the same characteristics as that of the population. (Kothari, 2004).

For this research, Data collection techniques include semi-structured interview for qualitative data and questionnaire with five points Likert scale to be distributed personally and through email to the subjects by the researcher to measure the perceived practice of Supply chain performance practices in the case of Soufflet Malt Ethiopia SC for quantitative data.

3.3 RESEARCH DESIGN

In this research descriptive and exploratory study design using quantitative method used to analyse data collected from respondents. The researcher used two sources of data to collect information. These are primary (Questioner and interview) . Using questionnaire and semi structure interview, the researcher tried to get the insight of the respondents about the level of supply chain practice in the

case company. The purpose of this study is also to describe and determine the level of perceived supply chain practice.

3.4 POPULATION AND SAMPLING TECHNIQUE

The total population of this study is 300 from different groups. As this is a case study focus on Soufflet Malt Ethiopia required Data is collected from Soufflet Malt Ethiopia, its key supplier and malting supply chain participants. The major input to source at Soufflet Malt Ethiopia is grain and most of the respondents are key strategic supplier. For this study, the researcher used Stratified random Sampling technique. This is because stratified random sample provides with the sample that is highly representative of the population being studied.

Stratified random sampling is used to see the research problems from different angles. These groups include input suppliers, service supplier and other malt barley supply chain participants.

According to Malhotra & Peterson (2006) there is no a single and precise way to determine the size of sample; hence there are several inadequacies for deciding on sample size. The larger the sampling size of a research, the more accurate the data generated.

The sample selection was made based on Carvalho's method (1984) which is given in the following table.

Table 3. sample size determination

Population Size	Small	Medium	Large
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1200	32	80	125
1201-3200	50	125	200
3201-10,000	80	200	315
10,001 – 35,000	125	315	500
35.001 – 150,000	200	500	800

Source: Carvalho, 1984

The sample of the research is 80 peoples from different groups determined based on Carvalho's method. A stratified random sampling involves dividing the entire population into groups called strata. Therefore, the population for the research stratified under 4 groups. The group classified as malt barley grain suppliers, input and service suppliers, Agronomy and Supply Chain department staff and other supporting staff working in Logistics and Procurement, Finance. Then random sampling technique used to identify representative sample from each group proportionally.

Table 4: Selected respondents from each stratum

Function	Population	Sample Size
Malt Barley Suppliers	230	60
Input and Service Providers	20	6
Agronomy and SC	33	9
Logistics, Procurement and Finance	17	5
	300	80

Source: Self

3.5 DATA SOURCES AND TYPES

This study used both Primary and Secondary Data. Primary data collected by using questionnaire and interview. While secondary data collected from previous literature and data relate to malting and brewery industry, available company reports, websites, journals, magazines, company manuals and procedures regarding the supply chain of malting industry.

3.5.1 PRIMARY DATA

The primary data gathered through questionnaire distributed to respondents through email and in person. Soufflet Malt Ethiopia staffs those are involved with the malt supply chain especially managers and field executives also interviewed.

3.5.2 SECONDARY DATA

Secondary data collected from previous researches, documents, annual reports, related articles, books, publications, online browsing, and journal that support and related to this research. The data is considered overall to be useful when establishing comparisons and evaluating data. Groupe Soufflet

home page and other malting industry related Journals, e-newspapers, e-books used to collect secondary data.

3.6 DATA COLLECTION PROCEDURES

First, questionnaire was developed and approved by advisor to collect data on reliability, responsiveness, flexibility, cost efficiency, asset management, integration, and collaboration of Soufflet Malt Ethiopia supply chain. Then, the questionnaire distributed to key grain suppliers, input, and service suppliers, Soufflet staffs both in head office and in field directly in person and through email.

3.7 ETHICAL CONSIDERATION

All ethical consideration in research is respected including the right to choose to respond the questionnaire, right to be informed, right of privacy, confidentiality, etc. This is applied during data collection, data analysis and writing final report. The researcher/data collector informed respondents the issue of confidentiality and highly secured on answering the questionnaires. The researcher also gave a consent to respondents their response does not disclose for anybody without their consent. Finally, the researcher respects the rights to anonymity, confidentiality and informs consent of the respondents.

3.8 DATA ANALYSIS

Qualitative and quantitative raw data collected through questionnaire, processed and analysed using computerized system. The Quantitative data was analysed by using descriptive statistics. For data analysis mean, variance or standard deviation, and cross-tabulations is used. Information obtained from respondents is analysed and interpreted with the help of SPSS Software.

3.9 VALIDITY AND RELIABILITY

Validity refers to how exactly a scientific investigation is carried out and how accurate the instruments and methods are, according to the purpose of the study. It's to study what you really intended to study and nothing else.

Reliability implies that a measuring instrument should be able to give reliable and stable results. If it is reliable other researchers should be able to come to the same results if they use the same method. Cronbach's Alpha Coefficient result of this research is 0.881 which is greater than 0.70. According to George and Mallery (2003) a reliability test of greater than 0.9 are excellent, greater than 0.8 are good, greater than 0.7 are considered as acceptable, greater than 0.6 –are regarded as questionable, greater than 0.5 is Poor, and a test result of below 0.5 is unacceptable.

Table 5: Cronbach's Alpha Coefficient for Each variable

	Supply chain performance variables	Cronbach's alpha result	N of Items
1	Integration & Collaboration with Strategic Suppliers	0.820	5
2	Supply Chain Reliability	0.789	4
3	Supply Chain Responsiveness	0.810	4
4	Supply Chain Agility (Flexibility and Adaptability)	0.842	5
5	Supply Chain Operation Cost	0.882	6
6	Warehouse Performance (Asset Management)	0.871	5

CHAPTER FOUR

4. RESULT DISCUSSION AND ANALYSIS

Introduction

In this chapter of the research, the profile of the respondent's, analysis, result, and discussion of the study on the Supply Chain Performance Assessment in the case of Soufflet Malt Ethiopia SC is discussed in detail. Quantitative data analysis is done using descriptive statistics to compute mean and standard deviation using a SPSS version 20. Different data visualization tools are used to present the finding. The qualitative data collected from the case malting company, local suppliers, logistics suppliers, and malt buyers were used to analyse the findings of the quantitative data.

4.1. Respondents' demography and Response Rate

A total of 90 questionnaires were distributed and 85 questionnaires were returned. Among the 85, five of them were in complete discarded.

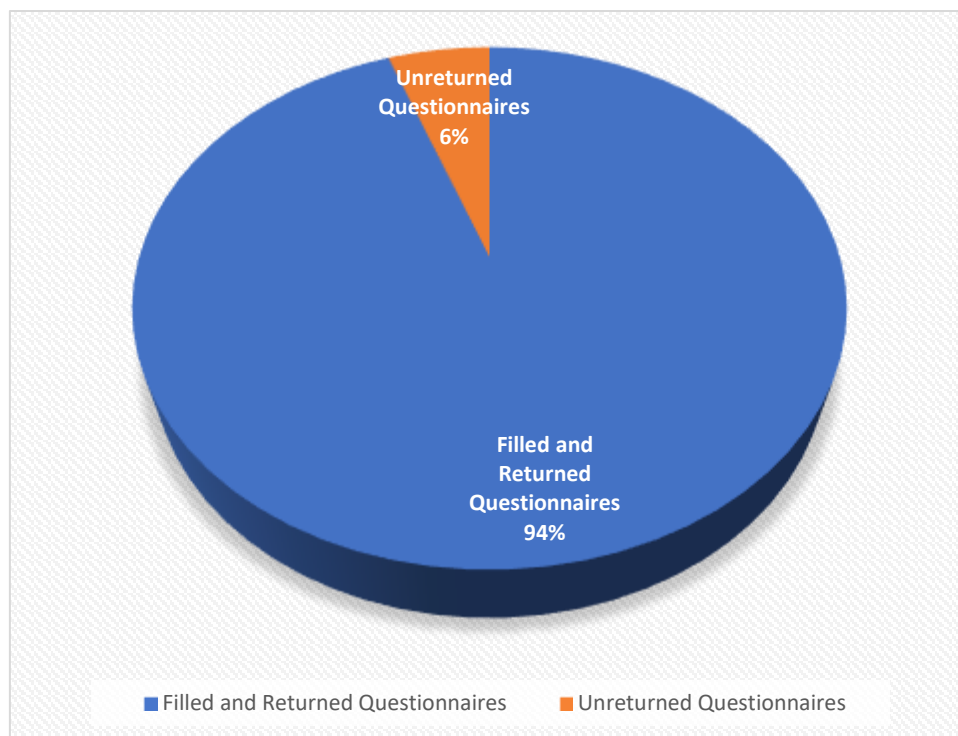


Figure 5: Questionnaire response

Education level of the respondent: As it is shown below, majority of the respondents holds college Diploma .

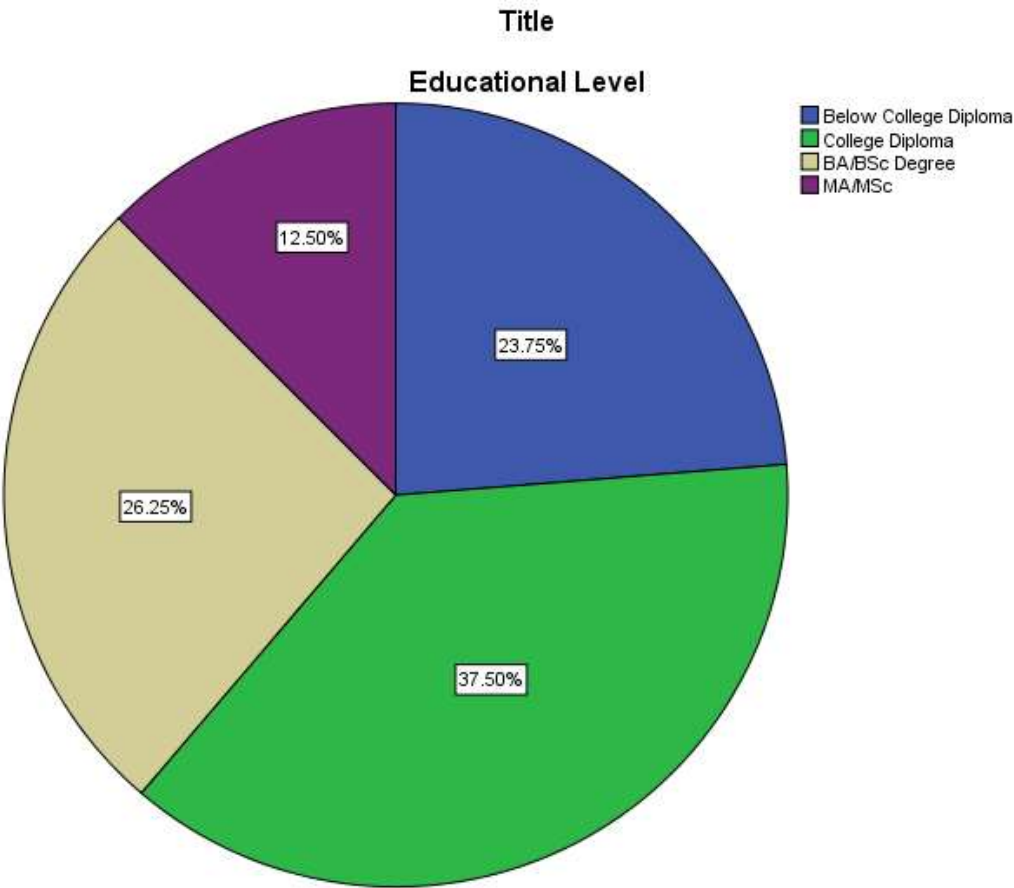


Figure 6: Respondent’s educational level

4.2. Employee’s Work experience

As it is shown on below figure, 7.5 % of the respondents have an experience of more than 10 years on malt barley supply chain and 27.5% have an experience between 5-10 years. Respondents with 2-5 years and below 2 years’ experience are 46 % and 19 % respectively.

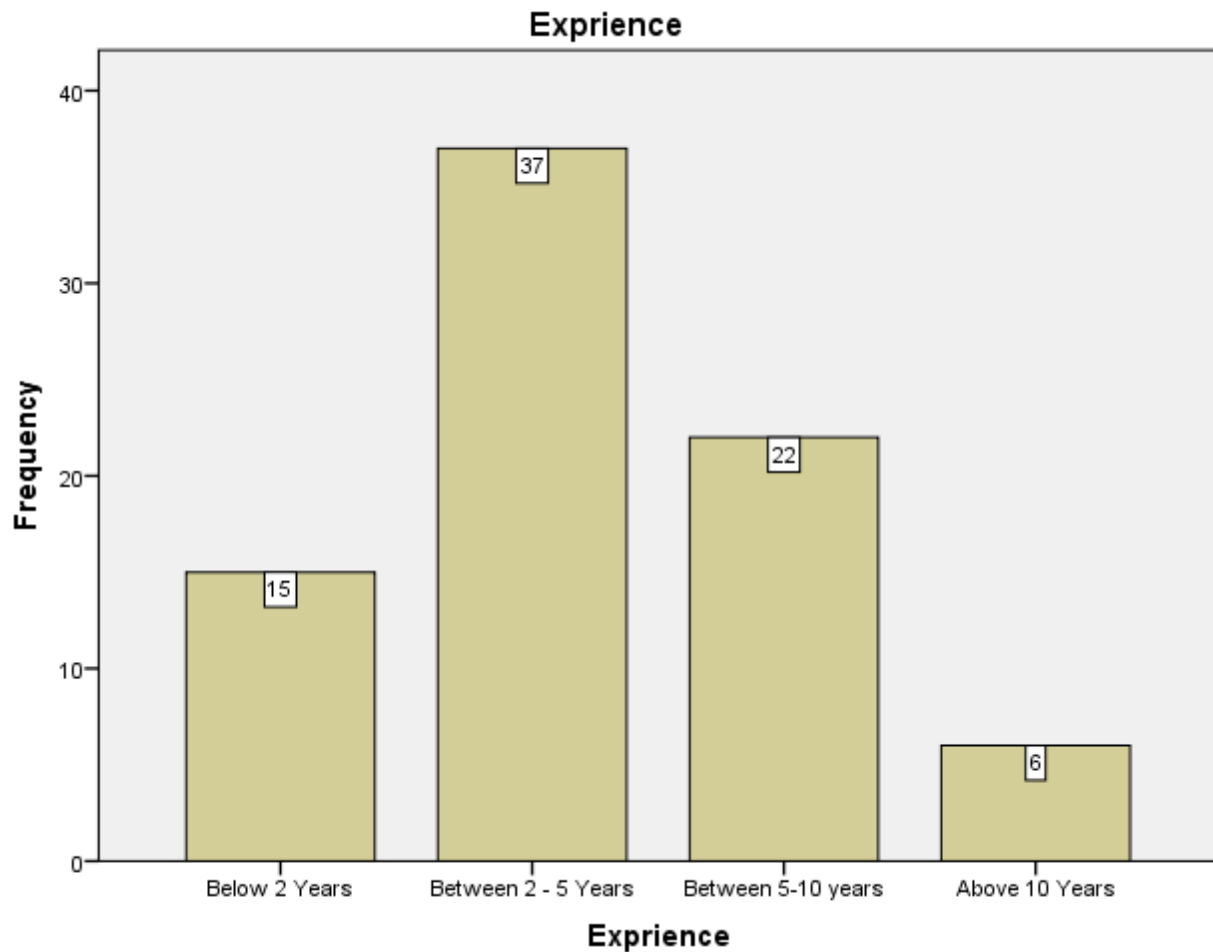


Figure 6: Respondent's Experience

4.3. Quantitative Data analysis

Based on their malt barley supply chain experience, respondents were asked to inform us the level of their agreement related to each supply chain performance measurement parameter on the questionnaires from their involvement with Soufflet Malt Ethiopia. Five Point Likert method was used where 1 for strong disagreement and 5 for strong (Best) Performance. To make analysis and asses company's performance three (Average level) is considered as a cut-off Point, where a value greater than 3 considered as better level of performance while less than three was considered as low level of performance which suggest a need for improvement and management concern. The researched also took three (Average level) as an indication for the area of improvement where the company management suggested to prepare action plan. Mean Performance score four and greater than four is considered as high level of supply chain performance.

Table 6: INTEGRATION AND COLLABORATION WITH SUPPLIER

SUPPLIER INTEGRATION AND COLLABORATION PERFORMANCE Sample: 80	Mean	Std. Deviation
Soufflet Malt Ethiopia have a long-term main input contract with input strategic suppliers.	4.33	.471
Soufflet Malt Ethiopia encourages and developed the capacity of its strategic suppliers	3.81	.393
Soufflet Malt Ethiopia share long term production and demand plans with its key suppliers	3.79	.412
Soufflet Malt Ethiopia involve key suppliers on planning to fulfil its demand and input supply	2.44	.499
Soufflet Malt Ethiopia trusts key suppliers to share supply chain information.	3.75	.436
GRAND MEAN	3.62	

As it is indicated above table, more than 80% of mean performance of integration and collaboration with its strategic suppliers is greater than 3 which is considered as high level of Performance, and even 40% of mean performance is greater than 4. Only one fifth (20%) of mean performance is less than 3 which is low level performance. This indicate that Soufflet Malt Ethiopia have high integration and collaboration with its strategic suppliers by working with a long-term contractual agreement. Soufflet also work on developing the capacity of its suppliers. The result also shows that there is trust of sharing supply chain information between Soufflet Malt Ethiopia and its key suppliers. There is low level of performance on involving suppliers on planning to fulfil its demand and input supply together.

The response from semi structured interview further explain that even though there is a contractual agreement between Soufflet Malt Ethiopia and its strategic supplier due to market price and high competitors in the market, the contract is not enforceable and mainly grain suppliers sometimes sell to other company with high price. The interview also indicates that there are some data that can't share to its suppliers as some suppliers work with multiple buyers and this key information are important to stay competitive in the market.

Related to capacity building of its supplier, Soufflet Malt Ethiopia give training on quality analysis and support financial to help on purchase malt barley. It also sometimes provides seed and chemicals with 50% prefinance to be collected in the next grain collection season. It also gives training on malt barley production.

Table 7: **SUPPLY CHAIN RELIABILITY**

SUPPLY CHAIN RELIABILITY(SCR) Sample: 80	Mean	Std. Deviation
Soufflet Malt Ethiopia meet the commitment made such as payment on time for input purchased or service received.	4.81	.393
Input Suppliers (Grain or other inputs) always meet the delivery of contracted quantity to buyer.	2.53	.503
Input Supplier deliver according to agreed quality on contract or agreement within agreed time.	3.68	.471
Soufflet Malt Ethiopia always deliver consistent service to suppliers.	4.75	.436
GRAND MEAN	3.94	

According to above result table 2 above, 75% of mean performance score for supply chain reliability is above 3 which is high level of Performance and only 25% of the mean performance score is below 3 which indicate low level of performance. These shows Soufflet Malt Ethiopia is meet the commitment agreed with suppliers. Additionally, its supplier's performance in delivery the quantity and quality agreed is low.

The qualitative data collected also indicate that, input suppliers mainly grain suppliers are in high competition with other company suppliers and low malt barley production contribute for low performance for not delivery the quantity and quality required per the contract. All companies like Boort Malt, Asela Malt Factory, Dashen Brewery and Habesha brewery collect barley from the same areas which creates high competition.

Moreover, high level of malt barley price fluctuation creates sub suppliers mainly farmers to keep their barley for long period of time to sell when the price is high. Some companies in the market also buy from anyone deliver to them and having contract is not their requirement. As semi structures interview indicate, quality parameters difference between companies in the market also contribute to low performance in quality and quantity supply to the case company.

As it was indicated in the background, malt barley grain is the main input for malting factory and if the quantity and quality required for factory operation is not collected locally, malting factories start looking to source from foreign country with hard currency. This will have its own implication for the industry as a specific and for the country as a general.

Table 8: **SUPPLY CHAIN RESPONSIVENESS**

SUPPLY CHAIN RESPONSIVENESS (RES) Sample: 80	Mean	Std. Deviation
The company has short raw material sourcing cycle time	2.18	.444
The company continuously collect the market price of inputs to align with the competitor within short period of time	4.15	.359
Soufflet Malt Ethiopia provide or prepare required input for collection within Short period of time	4.08	.414
Soufflet Malt Ethiopia collects extra grains to quickly respond to demand fluctuation.	2.50	.503
GRAND MEAN	3.23	

Supply Chain responsiveness result on the table 3 above shows that, 50% of mean performance score is above 4 which is considered as high-level performance and 50% of mean performance is below 3 which show low level performance. The area with high performance is short time response on aligning with market and competitors' price and providing requested input for collection within short period of time. Raw material sourcing cycle is long, and Soufflet Malt Ethiopia is not in position to collect extra for demand fluctuation. Qualitative data collected explain the above result as follows. Due to high demand of malt barley in the market for malting and food where many buyers are operating, most of the company is not able to fulfil their annual demand. Previously Asela Malt factory was the only malting factory in Ethiopia and currently two internationally well recognized companies, Soufflet and Boort Malt joined the market in Ethiopia with high malt production capacity and new technology from Europe. According to some secondary data Asela Malt Factory was full satisfying its demand locally and currently most of the companies are collecting less than 50% of their annual demand. These will lead the companies to source grain barley abroad with lead time between 3-5 months. This period is considered as long sourcing cycle.

All above factor affects the case company responsiveness.

Table 9: **SUPPLY CHAIN AGILITY (FLEXIBILITY & ADAPTEBILITY)**

SUPPLY CHAIN AGILITY (FLEXIBILITY & ADAPTEBILITY (AGL) Sample: 80	Mean	Std. Deviation
The company has quickly responded to changes on price based on market price.	4.15	.359
Soufflet Malt Ethiopia collection facility is flexible to accommodate a 25% increase in collection or delivery of inputs.	4.44	.613
Soufflet Malt Ethiopia quickly adjust quality parameters based on the reality of the market	3.45	.794
Soufflet Malt Ethiopia rapidly adjusts its collection and sourcing capacity to address achievement below plan	4.35	.480

Soufflet Malt Ethiopia input and service providers adjusts their plan to respond to higher order such as transportation and collection bag Supply.	2.93	.708
GRAND MEAN	3.86	

According to the data in the Table 10 above, 80% of the mean of Supply chain Agility indicators is above 3 which shows high level of performance and only 20% of mean performance indicator is below 3 which indicate low. These indicate Soufflet Malt Ethiopia is highly flexible in responding to changes in market price, and its facility can handle more than 25% increase in supply. It also re-adjusts its quality parameters based on the actual situations. It also rapidly adjusts collection and sourcing plan to achieve the plan. Input suppliers are also flexible on replanning based on request.

Qualitative data collected also support above findings. Due to high competition in the market, having high flexibility and adaptability is a key for success especially in this industry. Small difference in price for a week affect the performance of the company and Soufflet Malt Ethiopia continuously collect market to make changes. It also buys directly from Supplier warehouse by providing trucks with more than 40-ton capacity for high quantity inputs. Additionally, Soufflet uses different strategies to handle its supplier with different incentive and additional premium payments. The qualitative data also shows adjusting the quality parameter does not necessary mean adjusting to low quality. Soufflet have multiple Grade for barley delivered and price is per the grade of the barley. Therefore, it adjusts the quality parameters for grades within acceptable range to pay more and encourage suppliers.

To accommodate the future increase in Malt demand, Soufflet has already built some part of the second phase based on the information provided by government on production capacity at feasibility study period.

Table 10: **SUPPLY CHAIN OPERATION COST PERFORMANCE**

SUPPLY CHAIN OPERATION COST PERFORMANCE Sample: 80	Mean	Std. Deviation
Cost of Grain purchase	4.09	.532
Inventory carrying cost of Soufflet Malt	3.56	.499
Input Transportation cost of Soufflet Malt Ethiopia	3.28	.656
Cost of collection facility renting and Management	3.75	.436
Factory Input Production Support cost of Soufflet Malt Ethiopia. (Seed, Training, demonstration, etc)	2.68	.471
Production (Labor , Machine) cost of Soufflet Malt Ethiopia.	2.44	.499
GRAND MEAN	3.30	

Table 7 show Supply chain operation cost related to Grain purchase, collection facility renting and management, input transportation and Inventory carrying cost is high. Comparatively, Production cost and input production support cost is low. This is to indicate the cost of seed production; different kinds of training and research are low.

The qualitative data also show grain purchase and collection facility is high to due to the fact that Soufflet Malt Ethiopia rent multiple warehouse to collect barley in different location and finally it is important to transport collected barley from warehouse to the factory. The Company also cover the transportation cost from farmer to its warehouse and from its warehouse to factory. As the company currently don't own and a warehouse renting cost of big warehouses are high and sometimes it require to rent through the year. Additionally, warehouse located in Adama used as temporary storage location until it transferred to the factory located in Bole Lemi Industrial Park.

Even if the company produce and distribute seeds to farmers, the cost of production and distribution is low compared to the grain. This is due to the low quantity of seed production and the cost is recovered by adding to seed price. The cost of uncollected prefinance is also another minor cost which is around 5% of the total prefinanced amount.

In order to increase the efficiency of training and minimize training cost, Soufflet Malt Ethiopia focus on giving training in the farms by its field executives. COVID-19 cases also pushed the company to choose this strategy.

Table 11: **WAREHOUSE PERFORMANCE**

WAREHOUSE PERFORMANCE Sample: 80	Mean	Std. Deviation
Soufflet Malt Ethiopia set quality parameters and collection plan per warehouse.	4.54	.502
Soufflet Malt Ethiopia's warehouses are always ready for collection and reception of inputs	4.20	.683
Soufflet Malt Ethiopia select strategic locations of warehouse for building or renting	3.76	.428
Soufflet Malt Ethiopia use automated system to manage and follow up inventory	2.98	.675
Soufflet Malt Ethiopia share important information about warehouse with its strategic supplier i.e. capacity of warehouse, weighbridge availability and location	3.40	.493
GRAND MEAN	3.78	

As we can see from above table, more than 80% of mean performance score for warehouse performance is greater than 3 which shows high performance level and 20% mean performance is below 3 which shows low performance . Soufflet Malt Ethiopia clearly set quality parameters for each warehouse and collection plan for each specific warehouse. Soufflet's warehouses are always ready for collection and reception of Inputs. There is low performance on automating the warehouse for good management and inventory follow up. The other high performance indicated on the warehouse performance is sharing information about warehouse.

Qualitative Data collect also suggest that input quality parameters are clearly communicated to its staff and suppliers. Problem in quality parameters discussed with management team and correction action implemented with few days. Tools used for quality checking such as sieves, moisture tester and variety recognizing magnifiers fulfilled in advance. Warehouse renting contract mostly with

Ethiopian Grain Business cooperation finalized in advance and the warehouse is cleaned and fumigated before any operation.

Soufflet also rent warehouse in a strategic location where there is huge grain production mainly Asela, Dodola, Shashemene, Bale, Adama and Ambo. Among the above warehouse more than 80% of grain collection is collected in Asela, Shashemene and Dodola warehouse. Dodola also used as seed cleaning and distribution centre.

4.4. Finding Explanations

Most of the respondents and Soufflet Malt Ethiopia staffs agree on having strong collaboration and integration with their Suppliers are important for the achievement of the company plans. Soufflet and Its supplier integrate and collaborate in many ways in addition to Malt barley collection. Soufflet and other Malt Barley grain collector mostly provide interest free short-term loan to their suppliers to capacitate in purchasing. Soufflet Malt Ethiopia also give seed prefinance (Providing seed with loan to be paid on next collection). All agree as this increase production and productivity of malt barley for all stakeholders: Farmers, traders, unions, consumers, and buyers.

Suppliers also sign contractual agreement with malting companies before the start of collection and even though some suppliers are not loyal and undertake side selling to another company with higher price. Therefore, Integration and collaboration with Suppliers are average and mostly varies from supplier to supplier.

Soufflet also creates a platform where suppliers are oriented and trained on quality and quantity required and strategies for collection. At the end of collection there is also feedback discussion to improve their collaboration in the future.

Even if Soufflet share some important information with Suppliers, some very sensitive information such as price are solely shared to high performing and trustworthy suppliers. Among respondents 25% respond as Neutral and 75% respond as Soufflet share enough information to its supplier.

In malt barley supply Soufflet Malt Ethiopia is well recognized with fulfil commitments such as paying in short period of time and consistency in good service provision. More than 25% of respondents agree as Soufflet always deliver consistent service to suppliers and 75% strongly agree on this situation. There is also strong follow up and Support from Soufflet Malt Ethiopia Staff from commercial and agronomic perspectives.

The case company also have long input sourcing cycle mainly from January to May. Malt Barley collection process extends starting from November where warehouses and quality testing material prepared up to all collected barley transferred to factory from each warehouse. Soufflet Malt Ethiopia also frequently collect market price and respond for the difference from the market. By current situation Soufflet is not able to collect extra grain to achieve its annual plan due to many reasons. The major one is availability of malt barley grain in the market. Even if Soufflet has good performance in malt barley supply it is unable to collect the quantity needed.

As we can see from the response, Soufflet is highly flexible in responding to changes. Mainly price, quality parameters, performance progress and request from suppliers.

From operation cost perspective, the cost of malt barley purchase is the highest cost of the industry. High fluctuation of the price doubles the challenge of the company in minimizing the operational cost and price of final malt for breweries. The other major cost is transportation. As the company rented warehouse in many places for collection, transportation cost from farmers to warehouse and from each warehouse to factory is high. 33% of respondents agree Soufflet cost of Training and capacity building is low. The remaining 67% of the respondents respond as the cost of raining and capacity building.

Finally, from warehouse management perspectives 76% of the respondent agree Soufflet Malt Ethiopia located in strategic location for malt barley collection. But the automation and ICT application in warehouse management needs to be improved.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary

Building high level supply chain performance in terms of having strong integration and collaboration with partners and suppliers, cost reduction, responsiveness, reliability, and resource management such as warehouse are becoming crucial in this very competitive market to become successful specially for a company like Soufflet Malt Ethiopia. Every year demand increases in beer consumption which directly indicate high demand for malt is creating highly competitive market with limited resource in ground. Even if Soufflet Malt Ethiopia is new company joining the business in Ethiopia, it is highly competitive in the market by collecting malt barley grain which is main input used for malting.

The researcher was interested in assessing Soufflet Malt Ethiopia upstream level of supply chain performance by interviewing grain suppliers, warehouse managers/coordinators, Soufflet Staffs that has direct connection with Supply chain and even some competitor company staffs view on Soufflet. Based on the data collected Soufflet is leading the malt barley grain collection in major malt barley production areas such as Arsi and West Arsi Zone.

Quantitative and qualitative data was collected from respondents using semi structured interview and questionnaire. Semi Structured interview used to cross check the response on the questionnaire and it is collected from the same respondents. As we have seen in Chapter 4, six supply chain performance variables or indicators used to assess Soufflet Malt Ethiopia Supply chain performance. These variables are Integration and collaboration with strategic suppliers, responsiveness, reliability, Agility (Flexibility and Adaptability), Operational cost and warehouse management.

The result indicates that 80% of Supply chain integration and collaboration with suppliers is considered as high performance and only 20% considered as low performance. Supply chain reliability performance show that 75% mean performance score is considered as high performance and 25% mean performance show low performance.

Supply Chain responsiveness result shows that, 50% of mean performance is considered as high-level performance and 50% of mean performance show low level performance. From Agility perspectives

Soufflet has high performance in Flexibility and Adaptability in new developing situation and changes. This help the company to stay competitive and effective.

Finally, more than 65% of operational cost is high and only 35% of Supply chain operational cost low. This needs to be improved. Warehouse performance result shows more than 80% of mean performance score indicate high performance level and 20% mean performance shows low performance

5.2. Conclusion

Soufflet Malt Ethiopia integration and collaboration with strategic suppliers was generally considered good with a limitation in terms involving key suppliers on planning to fulfil its demand and input supply.

Even if Soufflet Malt Ethiopia is reliable in delivery the commitment agreed key strategic suppliers fails to fulfil their commitment. This is caused due to highly competitive market, high fluctuation in price and quality and low input availability.

Soufflet Malt Ethiopia were flexible to align with actual market situation and to manage extra delivery of inputs. It also pays extra to achieve its plan by even additional cost like transport service from suppliers. It also implements different strategies to maximize collection.

Supply Chain operation cost for input purchase, transportation, warehouse, and inventory carrying are considered as high. Warehouse management performance was also considered as low due to lack of automated warehouse management practices and tools. Cost of production input supply, training and research considered low.

5.3. Recommendation

Based on the findings the following recommendation is proposed to be communicated to the case company.

- To further improve the integration and collaboration with key strategic suppliers more, it is important to participate key strategic suppliers in company planning and strategy
- To improve the reliability in supply chain, on time information collection, establishing good communication channel and discussing challenges with supplier are crucial
- Responsiveness can be increased by using different tools , techniques, and skills for coordinating and optimizing key process, functions and relationship between its staff, suppliers, service, and input providers.
- Soufflet Malt Ethiopia should work closely with warehouse service providers, transport service providers and non-grain input suppliers in order to minimize cost of operation.
- Soufflet also needs to invest more on research and training to achieve its long-term plan of grain collection.
- The researcher recommended Soufflet Malt Ethiopia to implement modern warehouse and inventory management tools such as ERP to control and manage warehouse efficiently.
- To increase the production of malt barley and fulfil its annual grain demand, it is suggested to continue investing on seed production and distribution to farmers.
- Soufflet Malt Ethiopia should work closely with warehouse service providers, transport service providers and non-grain input suppliers in order to minimize cost of operation.
- Finally, it is recommended to discuss with competitors on making the market stable and reliable for coming years.

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Appendix A: Research Questionnaire

Addis Ababa University

College of Business and Economics

School of Commerce

Dear respondents,

The purpose of this questionnaire is to gather data for a research on Supply Chain Performance of Malting Industry: the Case of Soufflet Malt Ethiopia, and hence you are kindly requested to help the successful completion of the study by responding to below questions. Your response is anonymous and based on your volunteerism. Your response will remain confidential and only used for this research. So, your clear and timely response is vital for the success of the study.

Thank you in advance for your kind assistance and please fill and return the questionnaire as soon as you can.

SECTION 1

PART-1 RESPONDENT'S PROFILE

1. Gender : Male: ☐ Female: ☐

2. Educational Level

Below college Diploma ☐ MA/MSc ☐

College diploma ☐ Above master's degree ☐

BA/BSc Degree ☐

3. Your current position

Agronomist/Supply Chain ☐

Warehouse/Storekeeper ☐

Field Executive ☐

Malt Barley Grain Supplier ☐

Non-Grain Input/Service Supplier ☐

Logistics/Procurement /Finance ☐

Other: ☐ Please specify: _____

4. Your work experience in malt barley Supply chain

Below 2 years ☐

Between 2-5 years ☐

Between 5-10 years ☐

Above 10 Years ☐

PART 2: PERFORMANCE OF SUPPLY CHAIN

The following questions are about how Soufflet Malt Ethiopia is implementing supply chain Performance. Please indicate the level of your agreement or disagreement using (✓) on the following statements based on your experience on the following supply chain performance. The rating is from 1= Strongly Disagree to 5=Strongly Agree as shown below.

	INTEGRATION WITH SUPPLIERS (SSI)					
CODE	Description	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
IS1	Soufflet Malt Ethiopia have a long-term main input contract with input strategic suppliers.					
IS2	Soufflet Malt Ethiopia encourages and developed the capacity of its strategic suppliers					
IS3	Soufflet Malt Ethiopia share long term production and demand plans with its key suppliers					
IS4	Soufflet Malt Ethiopia involve key suppliers on planning to fulfil its demand and input supply					
IS5	Soufflet Malt Ethiopia trusts key suppliers to share supply chain information.					

SUPPLY CHAIN RELIABILITY(SCR)						
CODE	Description	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
SCR1	Soufflet Malt Ethiopia meet the commitment made such as payment on time for input purchased or service received.					
SCR2	Input Suppliers (Grain or other inputs) always meet the delivery of contracted quantity to buyer.					
SCR3	Input Supplier deliver according to agreed quality on contract or agreement within agreed time.					
SCR4	Soufflet Malt Ethiopia always deliver consistent service to suppliers.					

SUPPLY CHAIN RESPONSIVENESS (RES)						
CODE	Description	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
RES1	The company has short raw material sourcing cycle time					
RES2	The company continuously collect the market price of inputs to align with the competitor within short period of time					
RES3	Soufflet Malt Ethiopia provide or prepare required input for collection within Short period of time					
RES4	Soufflet Malt Ethiopia collects extra grains to quickly respond to demand fluctuation.					

SUPPLY CHAIN AGILITY (FLEXIBILITY & ADAPTEBILITY (AGL))						
CODE	Description	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
AG1	The company has quickly responded to changes on price based on market price.					
AG2	Soufflet Malt Ethiopia collection facility is flexible to accommodate a 25% increase in collection or delivery of inputs.					
AG3	Soufflet Malt Ethiopia quickly adjust quality parameters based on the reality of the market					
AG4	Soufflet Malt Ethiopia rapidly adjusts its collection and sourcing capacity to address achievement below plan					
AG5	Soufflet Malt Ethiopia input and service providers adjusts their plan to respond to higher order such as transportation and collection bag Supply.					

SUPPLY CHAIN COST PERFORMANCE (COS)						
CODE	Description	Very Low 1	Low 2	Neutral 3	High 4	Very High 5
COS1	Cost of Grain purchase					
COS2	Inventory carrying cost of Soufflet Malt					
COS3	Input Transportation cost of Soufflet Malt Ethiopia					

COS4	Cost of collection facility renting and Management					
COS5	Factory Input Production Support cost of Soufflet Malt Ethiopia. (Seed, Training, demonstration, etc)					
COS6	Production (Labor , Machine) cost of Soufflet Malt Ethiopia.					

	WAREHOUSE PERFORMANCE (WH) (Asset Management)					
CODE	Description	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
WHS1	Soufflet Malt Ethiopia set quality parameters and collection plan per warehouse.					
WHS2	Soufflet Malt Ethiopia's warehouses are always ready for collection and reception of inputs					
WHS3	Soufflet Malt Ethiopia select strategic locations of warehouse for building or renting					
WHS4	Soufflet Malt Ethiopia use automated system to manage and follow up inventory					
WHS5	Soufflet Malt Ethiopia share important information about warehouse with its strategic supplier i.e. capacity of warehouse, weighbridge availability and location					

SECTION 2: Interview Questions to Suppliers

1. Does Soufflet Malt Ethiopia share you its plan and demand? Please explain briefly

2. Does Soufflet Malt Ethiopia share their long term needs to manage inventory jointly you as a supplier? Please explain briefly

3. How do assess the collaboration and integration effort of Soufflet Malt Ethiopia in terms of capacity building, research activities, input, and output quality control, etc? Please explain briefly

4. Do you satisfy the demands of Soufflet Malt Ethiopia in terms of quality and quantity for the item or good you deliver? Please explain briefly

5. Do you have the capacity to handle unplanned demand/order changes of Soufflet Malt Ethiopia? How, please explain?

6. Does your company deliver quantity contracted on time with the right quantity and quality?

7. If not, what are the challenges for not delivering according to contract?

8. Does Soufflet Malt Ethiopia share you all information help you to deliver the right quantity and quality of Goods and services?

9. What supportive strategies do Soufflet Malt Ethiopia use to help you to fulfil your commitment?

10. How do you evaluate the overall performance of Soufflet Malt Ethiopia?

SECTION 3: Interview Questions to Soufflet Malt Ethiopia Company Staffs. Thank you for explaining the following semi structured questions.

1. How do you evaluate the level of your relationship, collaboration, and integration with your strategic input and service suppliers?

2. Please explain the areas of collaboration and coordination with your input and service suppliers as a supply chain member?

3. How do you explain the supply chain performance of Soufflet Malt Ethiopia in terms of reliability, responsiveness, flexibility, and operational cost?

4. What is the level of ICT utilization in the supply chain and communication within your warehouse and communication?

5. How do you assess the Soufflet Malt Ethiopia supply chain operation cost?

6. Please tell me about the Soufflet Malt Ethiopia warehouse management process in your company.

7. What is the level of involvement of your suppliers in joint planning, forecasting, and sharing supply chain information?
