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FACTORS AFFECTING UPSTREAM SUPPLY CHAIN INTEGRATION MANAGEMENT PRACTICE THE CASE OF ABAT&MEHARI AGIRO PROCESING FLOUR FACTORY)

BY: TESFAYE AYCHLUHIM

Advisor YEHYEYIS A. (Dr.)

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BY: TESFAYE AYCHLUHIM

Advisor YEHYEYIS A. (Dr.)

Approved By Board of Examiners

Advisor	Signature	Date
External Examiner	Signature	Date
Internal Examiner 1	Signature	Date
Internal Examiner 2	Signature	Date

Declaration

I, Tesfaye Ayichelhum, hereby declare that the research work entitled ""Factors ***affecting upstream supply chain integration management practise industrial plc at Abat and mehari agroprocessing plc****" is my original work that is done under the guidance and supervision of my advisor* **Yeheyis A. (Dr.)** The study has not been submitted in any institutions and all the sources of the materials in this research paper has been dully acknowledgeable.

Name: Tesfaye Ayechilhum Signature: _____ Date: _____

Statement of Certification

This is to certify that Tesfaye Aychilhehum has carried out his research work on the topic entitled ***‘“‘Factors affecting upstream supply chain integration management practise industrial plc at Abat and mehari agroprocessing plc****”is his original work and is suitable for submission for the award of Master’s Degree in Business Administration.*

Adviser's Name	***Signature***	***Date***
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ABSTRACT

This study investigated the factors influencing upstream supply chain integration practices in the context of Abat & Mehari Agiro Processing Flour Factory, Ethiopia. Recognizing that supply chain integration is crucial for competitive advantage, this research focuses on dimensions such as information integration, collaboration and resource sharing, organizational relationship linkage, ICT utilization, and inventory management. The research employed both qualitative and quantitative methods, utilizing descriptive and inferential statistical analyses. Findings reveal moderate levels of integration, with strengths in coordination and IT tools but significant challenges in inventory management and information integration. Barriers such as inadequate infrastructure, weak supplier relationships, and poor technological implementation are identified. The study concludes with actionable recommendations for enhancing supply chain integration and achieving organizational efficiency. This work contributes to supply chain management literature by addressing the unique challenges in Ethiopia's agro-processing sector.

Key words; Supply chain, ICT, Technology, Inventory Management

CHAPTER ONE

INTRODUCTION

This introduction part of the study discussed the background information of upstream supply chain integration, the intent, research problems, question and objective of the study. In addition, the scope and significance of the study also have discussed.

1.1. Background of the study

Recently, the rapid advancements of technology such as Globalization, wireless and internet networks, the basic supply chain is rapidly evolving into what is known as a Supply Chain Network. To cope with these fast-growing challenges manufacturing industries are implementing different systems like TQM, ERP, BPR, etc. But still the integration of supply chain is still in low level to develop the competitive advantage of the organizations (Fasika, B. G., Klaus-Dieter, T. & Marcus, S., 2014).

In this competitive world, one of the important tools for achieving organizational objective in manufacturing sector is integrating supply chain among the network. Organizations within the supply chain should manage the integration of business, people, technology and the process to get successful in the market (Intan, *et al*., 2015). Process integration and redesign is an important component of supply chain management implementations.

The upstream SCIM is often a rewarding and eye opening one, with organization establishing trust and starting to work collaboratively rather than independently. Efficiencies and synergies are quickly established between organization in supply chain that lower cost at every point and establish a network relationship with partners keeping supply chain running smoothly.

The development of supply chain integration described into four basic levels including; the first stage represents the fragmented operations within the individual company; the second stage is limited to integration between adjacent functions, for example, purchasing and materials control. In the third stage, the integration requires the internal integration of the end-to-end planning in the individual company and finally, the last stage represents the true supply chain integration including upstream to suppliers and upstream to customers (Stevens, 1989).

Integration among partners along the supply chain achievement involves information sharing especially with regards of projected product or service. In addition, it requires comprehensive look at customer service level, supply chain distribution channels, facility location, allocation, inventory, transportation information management as well as organization of the supply chain (Kent, 2001).

The development of supply chain integration described into four basic levels including; the first stage represents the fragmented operations within the individual company; the second stage is limited to integration between adjacent functions, for example, purchasing and materials control. In the third stage, the integration requires the internal integration of the end-to-end planning in the individual company and finally, the last stage represents the true supply chain integration including upstream to suppliers and upstream to customers (Stevens, 1989).

Supply chain Integration requires strong commitment and involvement by top management, supply chain risk management, needs to react to dynamic market changes and the factories brings high competition among them to win the market share throughout the country (Gunasekaran & Ngai, 2004).

Upstream supply chain integration requires technological integration primarily with main supplier and customer which has positive impact on overall monitoring and collaboration among the business entities within the supply chain. Supply chain integration can also encourage business firms for information sharing, collaboration and cooperation among them which enhance ultimate customer satisfaction (Power, 2005).

Supply chain Integration requires strong commitment and involvement by top management, supply chain risk management, needs to react to dynamic market changes and the factories brings high competition among them to win the market share throughout the country (Gunasekaran & Ngai, 2004).

Moreover, the nature of the business in the beer supply chain requires high level of upstream supply chain to win the market for the reason that , this research focused on analysing practice, level, benefits and challenges of upstream supply chain integration for Abat and mehari's products and recommended effective supply chain integration strategy to maximize the benefits of each partner from manufacturing to retailing as the result maximizing customers' satisfaction in terms of Price as well as product Quality.

The study was conducted to assesses the upstream supply chain integration practice in ABAT &MEHARI AGIRO PROSESING flour factory.And it touched all activities that create integration process between company and partners across supply chain. The study would cover the activities of upstream supply chain actors' start from company, wholesalers, retailers and customer. And it may investigate their performance, structures, facilities and integration practice across the supply chain within the company.

1.2. Statement of the problem

Literatures and empirical studies proved that practice of supply chain integration in Ethiopian manufacturing sector is at infant stage (Fasika, et al., 2014). On the other side, as supply chain management is one of the basic tools to win the market through fulfilling the interest of all partners in the supply chain and bringing customer satisfaction; integrating all participants plays great role to ensure their common goals.

In Ethiopia, brewery industry is evolving rapidly and gets attraction of direct foreign investment on the industry to fill the market gap. Recently numbers of new breweries have been come in to the market and the existing factories are expanding their capacity (Ethiopian News Agency, May 2016). These resulted in tough and aggressive market competition;

Research outputs indicate that, the upstream integration is least touched in both academic and practitioner literatures (Narayanamurthy & Gurumurthy, 2013). One of the probable reasons could be that, the design and coordination of upstream networks i.e. the distribution channels is considered to be the responsibility of more than one business functions. Sales and

marketing departments, operations department, and supply chain department end up in conflict while deciding on owning the distribution process (Wathne & Heide, 2004).

Inappropriate or lack of information technology integration with the business, poor IT infrastructure, insufficient and inadequate application of IT among the supply chain partners affects the overall supply chain performance (Gunasekaran & Ngai, 2004). As per the pre- assessment questioner information obtained from BGI selected supply chain managers and staffs, in BGI Products upstream supply chain integration, there is no Information Technology implemented in the upstream supply chain as the result the information exchanges are limited to traditional like letter, telephone and fax.

Cooperation, collaboration, information sharing, trust, partnerships and shared technology are the main milestones of integration in the supply chain (Akkermans, et al., 1999). In BGI product upstream supply chain the company made price and non-price decision making process by itself without participating major partners in the upstream supply chain. This implies the existence of lack of trust among the members in the upstream supply chain.

Practically there are limited loyal customers of beer who consumes only the specific brand beer. It's real that loyal customers developed based on the product and service quality, availability, accessibility, affordability and goodwill of that specific brand beer (Harrison & Hoek, 2008). As per the information obtained through pre-assessment questioner and observation in the beer market, the loyal consumers of BGI products are

limited as compared with the total sales of the company throughout the country.

Thus, the assessments were made on how coordination among stakeholders takes place, how is the practice and level of upstream supply chain integration in brewery industry among the supply chain partners , how members of the upstream supply chain members perceived the benefits of integration among them and the challenges observed for integration in the upstream supply chain.

Companies need to integrate their supply chain among partners into their operations. The strategic customer partnership construct would be operated base on five different activities that manufacturers commonly use to integrate their operations with customer namely emphasis on high, long term relationship with customer, jointly problem solving with customer, continuous improvement program with customer ,planning and goalsetting(Sunil Chopra and Peter Meindl,2009). The long term customer relationship practice has influences on the bottom line such as products quality. The upstream supply chain integration management practice in the world, our country and company is still in infancy stag there may be a number of manufacturing companies that may practice supply chain integration in a good manner and integrate their organization system. A number of studies on SCM practices had been conducted in Ethiopia on various manufacturing industry. Admaw (2010) studied the practice of SCM for Ethiopian textile firms. It was found that, SCM practices in Ethiopian textile firms are weak and not considering SCM as a strategic tool for competition. Business managers of the textile firms didn't give attention for SCM theories and practices. Temesgen Tagesse (2017) study on supply chain management practice and impact on firm performance in the case of Yotek

construction plc. His study was focus on SCM practice and impact on firm performance that determined in terms of operational and organizational performance. Mintesinot Abay (2018) test if there is a relationship between SCM practices, supply chain responsiveness, and operational performance in manufacturing industry in Bahir Dar. Moges (2015) study Practice and challenge of SCM on Ethiopian Private Grade one Road Construction Companies by selecting five companies among the twenty three companies and select seven sample sizes from each company. His study was focus on the practice and challenge of SCM practice as well as assessing collaboration level within supply chain members.

Abat & Mehari Agiro Processing Flour Factory, a, faces challenges in aligning its upstream supply chain processes with its operational needs. Factors such as limited supplier collaboration, inadequate communication, inconsistent quality of raw materials, and inefficient logistics have been identified as key barriers to effective integration. However, despite the significant impact of these challenges on production efficiency and customer satisfaction, there is a lack of empirical research examining the specific factors that hinder upstream supply chain integration in the context of this factory.

Preliminary observations suggest that integration issues stem from both internal management practices and external environmental factors. Internally, the factory struggles with limited technological infrastructure, poor data exchange systems, and insufficient training in supply chain management. Externally, inconsistent supply quality, lack of trust between suppliers and the factory, and weak supplier relationship management practices exacerbate integration efforts. These barriers, coupled with a rapidly changing market environment, further complicate the supply chain management process.

Empirical studies on supply chain integration have generally focused on large-scale enterprises or industries outside the food processing sector, creating a significant gap in understanding how upstream integration can be optimized particularly in the context of the agroprocessing processing industry. For instance, studies by Taticchi et al. (2010) and Lee et al. (2017) demonstrate the importance of technology and collaborative practices in improving supply chain integration, but similar empirical studies in developing countries, like Ethiopia, are limited.

Additionally, while global studies highlight the role of information systems, supplier trust, and effective communication in fostering upstream integration (Croom et al., 2000), there is a notable lack of localized studies focusing on how these factors apply in the specific context of Ethiopian SMEs in the flour processing industry. Thus, a deeper understanding of how these factors specifically affect supply chain integration in Abat & Mehari Agiro Processing Flour Factory is necessary.

This research aims to fill this gap by investigating the factors that influence upstream supply chain integration at Abat & Mehari Agiro Processing Flour Factory. By conducting empirical analysis, this study seeks to identify the key barriers and drivers of effective integration, with the goal of providing actionable

recommendations that can enhance the factory's supply chain management practices, improve efficiency, and contribute to overall business sustainability.

1.3. Research questions

The research was guided by the following main research questions

- What is the level and practice of upstream supply chain Information integration?
- What is the level and practice of collaboration & resource sharing in upstream supply chain information integration?
- What is the level and practice of organizational relation linkage between upstream partners of Abat and Mehari Ethiopia products?
- What are the perceived benefits of upstream supply chain integration?
- What is the level of ICT practice to facilitate & mange the upstream supply chain integration in the Abat and Mehari Agro processing plc.?

1.4. Objective of the study

1.4.1. General objective of the study

The general objective of the study was to investigate upstream supply chain integration in Abat and mehari agro processing plc.

1.4.2. Specific objectives of the study

The specific objectives of the study were:

- To analyze the level and practice of information integration,
- To investigate the level and practice of collaboration & resource sharing,
- To analyze the level and practice of organizational relation linkage in the case Abat and mehari upstream partners?
- To investigate the perceived benefits of upstream supply chain integration in brewery industry.
- To assess the level of ICT utilization and information flows in the factory

1.4.2 .Research Hypothesis

Hypothesis is a tentative answer to a research problem expressed in the form of a clearly stated relationship between independent (Cause) and dependent (effect) variable (Helani, 2018).

Therefore, the researcher developed the following hypothesis so as to test the relationship and effects of the predictor variables with the dependent variable1.

H1; collaboration and resource sharing: has significant effect on upstream supply chain integration management practice.

H2; practice of organizational relation linkage: has significant effect on upstream supply chain integration management practice.

H3; Information integration: has significant effect on upstream supply chain integration management practice.

H4; ICT utilization and information flows: has significant effect on upstream supply chain integration management practice.

H5.; Inventory management: has significant effect on upstream supply chain

integration management practice.

1.5. Significance of the study

Primarily, the study would be important for all actors of upstream SCIM practice as well as for the researcher. As for researcher it would contribute for the fulfillment of the academic performance in completion of MBA. Moreover, the study would contribute to the growing body of knowledge on upstream supply chain integration practice in the Ethiopia manufacturing organization context.

The study would be very important for the case of organization in order to see and evaluate the supply chain integration practice. Finally, the study would be important for academic researcher, and be used as a reference, to conduct further study on this interesting and important area of concept.

1.6. Scope of the study

This study was delimited on the upstream supply chain integration on Abat and Mehari agro processing plc. The Conceptual scope of this study was limited to the supply chain variables including information integration among the upstream partners, coordination and resource sharing practice and collaboration on Abat and Mehari upstream supply chain partners, information technology utilization practice, benefits, challenges of upstream supply chain integration

1.7. Limitation of the study

While this study provides valuable insights into the relationship between upstream supply chain practices there are several limitations that should be considered when interpreting the findings: The study was

conducted with a sample size of 163 respondents, which may not be fully representative of all industries or geographic regions. The findings may therefore be limited in their generalizability.

The results may not apply to all organizations, particularly those in different sectors or regions with different supply chain practices and integration levels.

The study primarily focused on upstream supply chain practices, without considering downstream practices or the overall supply chain network. The exclusion of downstream supply chain practices may not provide a complete picture of the integration process within the broader supply chain

Future research should consider both upstream and upstream supply chain practices to provide a more comprehensive view of overall supply chain integration.

1.8. Organization of the research report

This research is organized into five chapters: Chapter one contained the introduction part dealing with back ground of the study, the research problem, research questions, and objectives of the research, definition and terms, significance of the study and scope of the study.

The second chapter discussed related literature review on upstream supply chain integration. In this chapter, related empirical and theoretical literatures in supply chain reviewed to develop conceptual frame work which tried to address the problem statements indicated in chapter one.

In chapter three the research design and methodologies presented. Sample and sampling techniques, source of data, procedures of data collection, and methods of data analysis have been described.

In chapter four results or findings of the research discussed. The findings have been interpreted based on related literature review.

Finally, in chapter five summary of the research findings, conclusion and recommendation made. The summary was made based on findings and results which has been stated in chapter four followed by conclusion and recommendation.

1.9. Definition of terms

Supply chain

The strategic coordination of business functions within a business organization and throughout its supply chain for the purpose of integrating supply and demand management (Stevenson , 2012).

A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain includes not only the manufacturer and suppliers, but also transporters, warehouses, retailers, and even customers themselves. Within each organization, such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request. These functions include, but are not limited to, new product development, marketing, operations, distribution, finance, and customer service (Chopra & Meindl, 2007).

Supply chain Management

The management of upstream and upstream relationships with suppliers and customers in order to deliver superior customer value at low cost to the supply chain as a whole (Christopher, 2011).

Logistics

The efficient transfer of goods from the source of supply through place of manufacture to the point of consumption in a cost-effective way whilst providing an acceptable service to the customer (Rushton, *et al*., 2006).

Logistics management

The process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organisation and its marketing channels in such a way that current and future profitability are maximised through the cost-effective fulfilment of orders (Christopher, 2011).

Integration

Integration is a process of redefining and connecting parts of a whole in order to form a new one (Award & Nassar, 2010).

Supply chain Integration

The close internal and external coordination across the supply chain operations and process under the shared vision and value amongst the participating members (Lu, 2011).

Upstream

Upstream activities refer to the stages of the supply chain that are closer to the raw material sourcing and initial stages of production. It involves suppliers, manufacturers, and processors that provide the necessary inputs for the production of goods. (Sadler, 2007).

Downstream; Downstream activities refer to the flow of goods and services from the point of production to the final consumer. It involves the distribution, marketing, sales, and delivery of the finished products to the end-users.

CHAPTER TWO

Review of Related Literature

2.1. *Introduction*

In this chapter, different relevant literatures have been reviewed related to upstream supply chain integration to develop the conceptual framework of the research. The main area of the literatures reviewed are the conceptual or theoretical aspect of supply chain integration which lead to come up the good understanding of upstream supply chain integration practice, challenges and benefits to partners in the upstream supply chain.

2.2. Theoretical Literature review

2.1.1. *Overview of supply chain integration*

Supply chain is an integrated system wherein number of business entities work together for efficient and effective flow of material and service, information and funds (Kittipong, *et al*., 2013). Supply chain management is the process of value to achieve sustainable competitive advantage. The flow of materials and information through a business from the purchasing activity, through the operations and out to customers, by way of distribution or service delivers activity can be described as immediate supply chain. There are often strategic benefits to be gained in managing the flow between customers and supplier.

As Jim Langabeer & Jeff Rose (2002) description, the historical supply chain has focused on the efficiency and execution and has fallen short in bringing significant improvement in firm's level competitiveness. They strictly recommended that, "Supply chain must now take the next step and incorporate the business knowledge and practice that will help the firm understand their market place and drive the firm's strategy to the operational level in order to differentiate itself substantially from its completion (Langabeer & Rose, 2001)." In this situation supply chain enables the business organization to be efficient and competent not the business companies within the chain but completion among supply chain.

The term supply chain management was originally introduced by consultants in the early 1980's and since then has received considerable attention. A supply chain is much wider than logistics in terms of intercompany, boundary spanning concept (John & Chandra, 2012).

The upstream supply chain incorporates the supply of raw material, store, and transport to

manufacturing companies while upstream supply chain includes organizations which are responsible for conversion of raw material to semi-finished or finished product, distributors and retailers who directly communicate with ultimate consumers.

Upstream supply chain integration as part of the whole supply chain will have the lion share for the effective and efficient implementation of the supply chain to address the customer requirement at the right time, the right quality, at the right price.

2.1.2. Supply chain management definition

The concept supply chain has been described by different scholars in different ways. Mentzer *et al.,* (2001), argue to define the supply chain in terms of either in terms of management philosophy, the implementation part of philosophy or as a set of processes.

As John *et al*., (2001) describe supply chain management as a strategic and systematic integration of functions and strategies of business organizations for sustainable performance of the business by satisfying the ultimate customer (John, *et al*., 2001). Supply chain management also described as a network of different autonomous and semiautonomous business organization in the upstream and upstream supply chain partners who are responsible for the supply of inputs, conversion to finished and semi-finished product and distribution of product to create value at the hands of the ultimate customer (Swaminathan, *et al*., 1996; Lee, 1995; John & Chandra, 2012).

Supply chain management also described from management perspective as "The management of Materials, Information and funds from the initial raw materials supplier to the ultimate consumer (Deloitte, 1999)" It also described by Christopher (2011) as "The management of upstream and upstream relationships with suppliers and customers in order to deliver superior customer value at low cost to the supply chain as a whole" (Christopher, 2011).

Stevenson (2009) also defined supply chain as value chain and in terms of coordination of business functions in an organization or throughout the supply chain for the purpose of demand management.

2.1.2. *Development of supply chain*

Since 1980s, there has been a marked shift in the focus of operations strategy (Frohlich & Westbrook, 2001). In 1980s the focus were about vertically aligning among the functional departments of operations with business strategy of an organization (Robert & Steven, 1984), the 1990s have been about horizontally aligning operations across processes among external organization along the supply chains (Chrostopher & Sumantra, 1995).

As Award and Nassar (2010) description, in most industries today, it is not enough simply to optimize internal structures and infrastructures based upon business strategy. The most successful manufacturers seem to be those that have carefully linked their internal processes to external suppliers and customers in unique supply chains.

Even though the concept of supplier and customer relationship got great attention since 1980s, Globalization, environmental factors and intense business market put great pressure to the business organization to develop extremely close relationships with selected clients, or strategic customers. These situations create significantly more emphasis to place in the position on improving working arrangements towards collaboration with suppliers and customers (Award & Nassar, 2010).

The driver behind such collaboration was the desire to extend the control and co-ordination of operations across the entire supply process, replacing both the market and vertical integration as the means of managing the supply chain process (Larsen, 2003). According to Hau L. Lee and Seungjin Whang (2001), supply chain integration described as the existence of collaboration and coordination among partners to develop competitiveness in the business. Accordingly, supply chain integration has four basic dimensions; Information integration, synchronized planning, workflow coordination and new business model (Hau & Seungjin, 2001).

2.1.3. *Supply chain management theories*

Literatures pointed out the advance of different theories are the fundamental foundations of business studies (Lagat, 2013). The most theories in which supply chain management literatures explored are Transactional cost analysis, resource based view, network perspective and principal-agent theory. These theories describe supply chain management in different views which no one of them can be considered as right and the other is wrong (Holldorsson, *et al*., 2007). They suggest transactional cost analysis (TCA) and Principal Agent Theory (PAT) to well describe how to structure of the supply chain when it is perceived as a collaboration of institutions within the supply chain while adopting Resource Based View (RBV) and network Theory (NT) will help us to insight what is needed to manage a particular structure of the supply chain.

Applying Resource based view and network theories in the supply chain concept used to identify the resources required to stay competitive and to show the dynamics of the inter organizational relationship. The network theory has been found as best suited for this research to develop the conceptual framework and briefly discussed below.

2.1.4. *Transaction cost analysis*

As Clemons & Row (1992) analysis, transactional Cost theory answers why the business organization exists. In supply chain context, the main objective of transactional cost theory is, reducing the cost associated with decision with respect to transaction. Transactional cost theory describes the reason tasks are performed in different parts of the supply chain. Transaction costs can be divided into coordination costs and transaction risk. It is also described as Coordination

costs which the direct costs of integrating decisions between economic activities while Transaction risk is linked within the relationship of the partners in the supply chain (Clemons & Row, 1992).
The main factors which affect the components of the transactional cost theory are Uncertainty, frequency and asset specificity; which these factors can influence the coordination cost and transactional risk on make-or-buy decision (Williamson, 1985).

In supply chain management, organization implemented Transactional Cost Theory claimed that different control mechanisms have to be implemented as a mechanism to mitigate the risk of opportunistic behaviour of supply chain partners (Pala, 2013).

2.1.5. *Network theory*

Even though the management of buyer and seller relationship is not a new issue in the market, with the emergency of supply chain management, the network perspective it becomes a hot topic in both academics and business which replacing the traditional markets to networks of interrelated firms (Möller & Halinen, 1999).Network theory is a useful framework for analysis of a business situation, and it adds a new level of complexity to understanding the relationship perspective of business firms in the supply chain (Jarillo, 1988). As per Mikkola's (2008) study, Network relations is the most important element to create the mechanism for information sharing that enables both buyers and sellers to have access to resources and knowledge beyond their abilities which it will help the partners to have long-term relationships. Network theory also described as the most important theory for supply chain management to show the relationships in which partners within the supply chain interacts each other (Harland, 1996). Network theory helps researchers to define supply chain in network perspectives. Harland (1996) defines the network as "a specific type of relation linking a defined set of persons, objects or events." In addition, Chang, Chiang & Pai (2012) describe supply chain as, "Supply chain network is a complicated network model, and its specific context depends on the relationships among the network members." Network defined as the interaction of two or more business organization for long term benefits (Thorelli, 1986).
Mills *et.al., (*2004) highlighted the contribution of Network perspective on supply chain management that; it could underline as mechanism to lead supply chain partners to develop competitive advantage that companies share information and knowledge with their partners. The network theory is also applicable to the most important decision points in the supply chain activities. Business partners in the network also develop trustworthy among them and can add value in supply chain decision strategy. The Network perspective also encourages long term contracting among the supply chain partners.

2.2. Empirical Literature review

2.2.6..Benefits and challenges of supply chain

In the current competitive market, organizations must integrate their business, human resource, capital, technology and the way of doing within the organization and across the supply chain. The concept of supply chain management system enables organizations to create integration, collaboration, coordination of suppliers and customers, partners along the chain. Although supply chain integration brings significant benefits and competitive advantage to organizations, the management and implementation of this system face challenges to organizations (Award & Nassar, 2010). In this situation, they also highlighted that, to overcome the challenges it requires Process integration and redesign is important component SCM implementations.

2.2.7.Benefits of supply chain

Kittipong Tissayakorn (2013) describes the flow of information to upstream from customer to supplier while the flow of material upstream from Supplier to customer. The upstream flow of information is as from customer to retailer, then to agent, then to manufacture then to the supplier. The basic characteristic of supply chain integration is information integration in which members in the supply chain being informed simultaneously (Kittipong, *et al*., 2013).

In modern supply chain management as information flow, material flow has to be coordinated among all partners in the supply chain. In this regard, it implies activities should be coordinated upstream and upstream.

In order to the organization fully benefit and implement supply chain management concepts, it is important to integrate efficiently with suppliers, manufacturers, warehouses and other intermediate value-adding partners. Douglas & Martha (2000) show the importance of cross- functional integration via marketing with examples of several cases (Douglas & Martha, 2000). Hugo *et.al.*,(2004) also emphasize on manufacturers to give high attention to integration so as to insure the main supply chain activities like sourcing, production and distribution are synchronized with customer demand, as the result the overall costs will be decreased and high level of customer service will be achieved.

Integration has to do with the competitive edge of those committed to the supply chain. Supply chain integration is motivated by increase in supply chain competitive advantage. Apart from this the main characteristics of supply chain integration in manufacturing companies are Customer satisfaction, new cooperative completion and enhancing strategic alliance among the partners throughout the supply chain. (John, *et al.*, 2001)

Growing evidence suggests that the higher the level of integration with suppliers and customers in the supply chain the greater the potential benefits (Frohlich & Westbrook, 2001). When

companies integrated as one entity, their performance will be enhanced throughout the chain. On the other side, Keah *et al.*, (1998) highlighted the risks of not fully integrating of the upstream and upstream partners may cause the imbalance of supply and demand across the chain (Tan, *et al*., 1998).

2.1.6. *Challenges of supply chain*

The significant challenges on supply chain integration arises due to lack of visibility of demand, inventory holding status across the supply chain and adversarial relationship between the trading partners (Barratt, 2004). Companies are mainly focusing on their core competencies rather than looking the overall capability of the supply chain, as the result the vertical integration is happening (Sweeney, 2012).

The implementation of supply chain management is not as simple as we are thinking. It would face different challenges internally as well as externally, with respect to integrating supply chain specific strategies with the overall corporate business strategy (Award & Nassar, 2010). In recent years, along with the change in business realities related to globalization and modernization, the supply chain has got the first priority on top management of the business entities and they pay attention to cut costs and to bring their competitive advantage to satisfy their customers (Award & Nassar, 2010).

According to researchers, supply chain integration challenges classified in different ways. According to Stanley *et al* (2005), supply chain integration challenges classified as challenges of system relationships between sub systems in an organization and relationship between supply chain management systems.

Challenges of supply chain integration classified into different perspectives as technical, Managerial and relationship perspectives (Award & Nassar, 2010). They proposed to integrate all challenges to comprehensive source to bring benefits to the supply chain in such a way that; integrating challenges can help supply chain partners to decrease the complexity of the challenges; prioritizing the challenges effectively; for better allocation of resources and introducing a comprehensive source that contains all challenges stated above.

2.1.7. *Integrating supply chain*

Successful supply chain management requires a high degree of functional and organizational integration. Even though supply chain integration has significant importance to the whole supply chain partners, such integration cannot be achieved overnight (Krajewski & Ritzman, 2003).

A fundamental principle of SCM is the development of collaborative and partnership relationships throughout the supply chain, including with customers and suppliers. The most

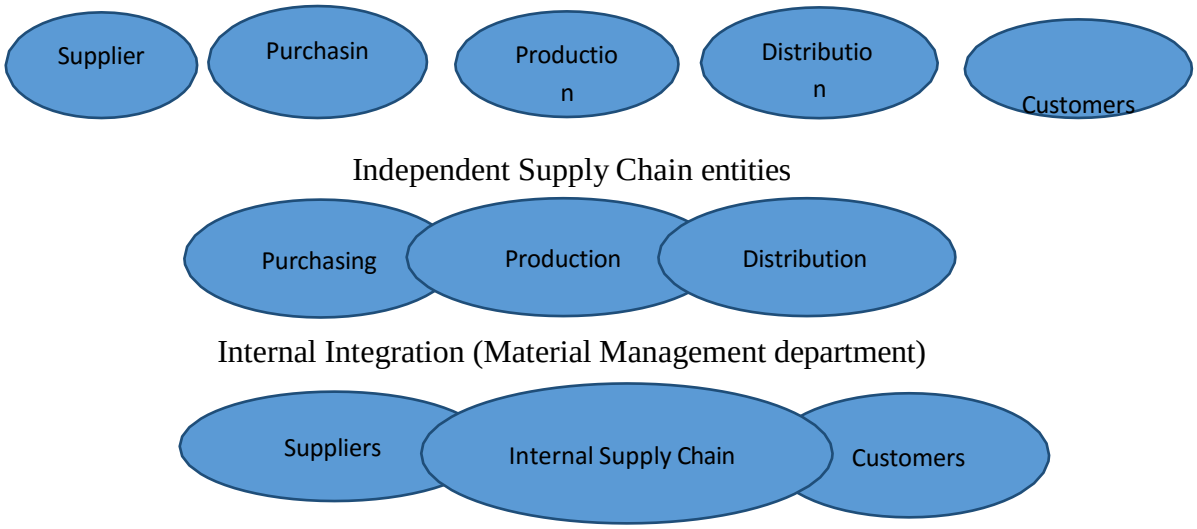
important sign of which shows the degree of supply chain integration in firms relates to the extent of customer and supplier involvement in supply chain activities (Sweeney, 2009).

The term integration defined in Webster dictionary as ‘‘the unified control of a number of successive or similar economic or especially industrial processes formerly carried on independently (Webster's , 1966).”

Thus, supply chain integration (SCI) can be referred as, the degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra and inter organizational processes, in order to achieve effective and efficient flows of products and services, information, money and decisions, to provide maximum value to the customer.
Integration is the quality of collaboration that exists among clusters to achieve an effective, efficient and united system. SCI defined as the degree to which a manufacturer strategically collaborates with its supply chain (SC) partners and collaboratively manages throughout the supply chain. The ultimate goal of SCI is to achieve effective and efficient flows of products and services, information, money and decisions, to provide maximum value to the end customers (Barbara, *et al*., 2010).

The supply chain integration involves not only implementing ERP systems and ensuring they communicate or interface with legacy systems, but it also involves integrating ERP and SCM systems with Customer Relationship Management (CRM), Product Lifecycle Management (PLM), and e-procurement and e-marketplaces, as well as making them available over the Web to foster cooperation and collaboration across the entire value chain (Award & Nassar, 2010).

Traditionally organizations have been segmented in to three categories to ensure the flow of material or service as Supply of materials, Production and Distribution. Purchasing is responsible for the acquisition of goods and services as an input and production is responsible for the transformation of inputs into semi-finished and finished goods and distribution is responsible for addressing the finished goods to ultimate customers (Krajewski & Ritzman, 2003).



Integrated Supply Chain Figure

2.3-1 Level of Supply Chain Integration

Source: Krajewski & Ritzman (2001)

As we can see above, the development of integrated supply chain has three phases; first phase is identifying components of supply chain as Supply, Production and Distribution; Second phase create internal integration as material management and finally at the third phase represent true supply chain integration including upstream to suppliers and upstream to customers. But it is not as simple as we talk. It needs high level of commitment of higher level management of each organization in the supply chain, well planned implementation, monitoring and controlling of the level of collaboration among the supply chain members (Stanley, *et al*., 2010).

These collaborations provide access to human resource, technology, capital and information. They also enable to solve problems quickly by generating new ideas and to transfer technology. Moreover, collaboration reduces lead times, minimizes inventories and increase asset utilization, where all these in turn lowers the cost of production.

2.1.8. *Type of supply chain integration*

According to Flynn, Huo and Zhao (2010) supply chain integration is the extent in which the manufacturer (Internal integration) and the extended forms in both directions (Upstream and upstream) strategically collaborate for achieving mutual beneficial goals (Barbara, *et al*., 2010). On this definition they highlighted importance of strategic collaboration as an ongoing partnership to achieve mutually beneficial strategic goals. It provokes mutual trust, increases contract duration and encourages efficient conflict resolution and sharing of information, rewards and risks.

Supply chain integration is the basic tool to successfully attaining supply chain management (Grham & Mark, 2016). There are four primary model of supply chain integration including;

back ward integration, forward integration, forward & back ward integration and internal integration (John, *et al*., 2011).

Kanter (1994), described five type of integration in collaborative relationships that include: strategic integration, tactical integration, operational integration, interpersonal integration and cultural integration (Coughlan, *et al.*, 2003).

Supply chain integration mainly classified into two main categories; internal integration and external integration (Upstream or supply integration and upstream customer relationship). In the context of supply chain integration, internal integration and external integration play different. Internal integration recognizes that the functions of each department in the organization should be activated as part of an integrated process. However, external integration acknowledges the importance of developing close, interactive relationships with customers and suppliers (Barbara, *et al*., 2010).

2.1.9. *Internal integration*

Internal integration is the creating coordination among functional departments within an organization. The internal integration, the function to function integration within the business organization can be considered as the first step of operational integration as the bases of effective supply chain integration as the benefits of external integration (Harrison & Hoek, 2008).

Identify fundamental information requirement of each functional department and creating an access of information among these department is the process of creating internal integration. This is often accomplished through a company-wide ERP system, which links internal groups via a single integrated system. ERP software applications support the re- engineering of business processes and form the foundation for an integrated organizational value system (Robert & Ernet, 2002).

The impact of internal integration on external integration characterized by high internal integration can reach a level of collaborative internal operation, with which the whole firm works like an integrated system that results in better performance and better interdepartmental effectiveness, such as cycle time reduction, better in-stock performance, increased product availability levels, and improvement in order-to delivery lead times (Harrison & Hoek, 2008).

2.1.10. *External integration (upstream and upstream)*

The supplier base is really an extension of the enterprise. As such, supplier relationships (face-to-face, telecommunications, or the Internet) need to be developed as aggressively and strategically as customer relationships (Frazelle, 2002).This implies that the upstream

supply chain integration which give high emphasize to the supplier should be equal to upstream supply chain integration.

External integration also refers to the systems that coordinates and crates collaboration among all stakeholders with on the value chain (the supplier, manufacturer and the customer). External integration allows all partners to share critical information such as forecast demand, actual orders, and inventory levels across the supply chain. Systems used to integrate supply chain members include advanced planning systems, Internet linkages, network communications, and Electronic Data Interchange (EDI) (Robert & Ernet, 2002).

External supply chain integration described both in upstream and upstream supply chain integration as; upstream supply chain integration involves core competencies derived from coordination with critical customers, whereas upstream supply chain integration involves core competencies related to coordination with critical suppliers (Donal & Edward, 1989).

High level of collaboration and information sharing activities with key customers in the upstream supply chain, providing the business entity with strategic insights into market expectations and business opportunities, and enabling a more efficient and effective response to the end customer (Schoenherr & Swink, 2012). On the other side, Germain *et al* (2008) argue that upstream integration reduces unpredictable demand and leads to better financial performance.

Effective external integration with customers may enable organizations to reduce demand- side risks, and to minimize potential occurrences of anything that may affect the business firm ability to meet the requirements of customers and end-users. Through integration with customers, companies can better understand customer needs and respond more quickly to them. Integration with consumers contributes to demand planning, greater visibility in sharing information, and a consequent increase in the level of service (Thomas & Alcantra, 2013).

2.1.11. *Supply chain integration dimensions*

Different authors study supply chain integration in deferent perspective due to lack of clarity on the concept of supply chain integration; Some examined supply chain integration with single dimension while others with multiple dimensions (Rafaela, *et al*., 2012). By analyzing supplier and customer relation management within the supply chain, R. Lee (2000) recommended that supply chain integration has three main dimensions: information integration (II), coordination and resource sharing (CRS) and organizational relationship linkage (ORL) (Lee, 2000).

2.1.11.1. *Information integration*

Information is one of the most important element in supply chian management cooperation. It can be considered as a fasten which holds together different parts of the supply chain, structure, process and entire supply chain (Moharana, *et al*., 2012). According to Lee (2000), information integration defined as the sharing of information among the supply chain partners which include, customers' demand, inventory status, promotion plans, sales forecasts and production schedules (Rafaela, *et al*., 2012). In information integartion, memebrs of the supply chain collaborate each other to establish production and sales forecaste.

For sucessful supply chain improvement, the integration of business firms in the supply chain should start with the exchange of information (Frohlich & Westbrook, 2001). In the current dynamic market, the ability of the business firm to share information among the supply chain develops the competitive advantge for many organization.Business organizationsare implimenting the functionalities of information technology to redesign their process so as to develop competitve advantage on it (Phan, 2003). Responsivness of the business firm for custmer demand in the market will be enhanced when there is effeicient information integartion throughout the supply chain partners. Inaddition the suply chain perfomance as ateam is highly dependant on the information system impimented to share information and the information technology utilized among them (Rafaeli & Ravid, 2003).

2.1.11.2. *Coordination and resource sharing*

Coordination and resource sharing CRS refers to the realignment of decisions and resources intra- and inter-organisationally (Rafaela, *et al*., 2012).On the other side, coordination and coordinated decision making is described as separated entities that work together for decision making to enhance overall supply chain perfomance (Moharana, *et al*., 2012). If separate companies coordinate, it is referred as combination or integration. Coordination is an active cooperation among partners so as to harmonize different activities or interactions to achieve a disired goals.

Coordination is the fundamental mechanism to improve supply chain perfomance. Chopra and meindl (2007) sugeted that, profitablity of the supply chain as a whole can be maximized when all atages of the supply chain are coordinated (Chopra & Meindl, 2007). Information is a mechnism to creat coordination among supply chainpartners to maximize profit and high level of customers's satisfaction interms of quality of goods and sevices delivered (Moharana, *et al*., 2012). In other words, coordination in supply chain can be achieved through different entities work together by sharing information as well as resources to maximize customer value and reducing deamnd uncertenities like bullwhip effect for the entire supply chain (Arshinder, *et al*., 2007; Lee, 2000)

Coordination among the supply chain partners not only improve product perfomance but also creats strategic alliance for the success of the overall supply chain partners through sharing information, resources, risks and benefits (Pyke, 1998; Pyke & Johnson, 2004)

Reource sharing is one of the most critical factor for effective coordination in supply chain management (Arshinder, *et al*., 2008).

2.1.11.3. *Organizational relationship linkage*

Inter organization realtions defined as formal arrangements that bring together tangeble and intangebele assets diffrent legally independent organizations with the aim to produce joint value added to the ultimate customers (Benchmann & Witteloostuijn, 2006). Organizational Relation Linkage ORL involves well establishedrelations and transparent interactionsamong the supply chain members, which demands common visions and objectives, ideas and organizational culture and integarted performance measures, incentive schemes and sharing of skills (Rafaela, *et al.*, 2012).
Organizational relationships are networks of resource interdependencies. The organizational relation linkage includes all participants in the supply chain including manufactures, buyers, suppliers, customers, government agencies, and other external organizations like third party logistics service providers that are critical to the success of the supply chain (Tillquist, 2002).Organizations relation linkage is the key instrument to share critical resources like inputs, skill and knowledge, idea, information, technology and logistical equipment. Information and Information Technology is a key component for the successful implementation and management of organizational linkage in the supply chain (Pfeffer, 1992; Tillquist, 2002).

2.1.12. *Drivers for supply chain integration and collaboration*

Collaboration is about organisations and enterprises working together and can be viewed as a concept going beyond normal commercial relationships. Collaboration existes when organizations in the value chain recognise where working and operating alone is not sufficient to resolve common problems and to achieve the desired goals (Matopoulos, *et al*., 2007).
Supply chain collaboration is a powerful tool to develop and impliment an agile and lean supply chain management (Leeuw & Fransoo, 2009). As Erlinda Yunus (2013) description, The main drivers of supply chain integration can be classified as Internal drivers(anticipation of the benefits from the supply chain integartion and Customer orentation) and external drivers (Supply uncertainity, customer uncertainity and technology uncertainity) (Yunus, 2013).

2.1.13. *Role of ICT for supply chain integration*

One of the basic tools for efficient upstream supply chain integration is implementing information technology along the supply chain. The most significant roles of information

systems in the supply chain are to decision making process, to monitor and control operations, to create stimulated systems, to store and process data and communication among individuals, companies and machineries (Rushton, *et al*., 2006).

Information and communication technology (ICT) is an important enabler for efficient supply chain integration, and many ICT applications have recently gained popularity (Fasika, *et al*., 2014). This is due to their ability to facilitate, coordinate, and integrate the flow of information across the supply chain. ICT is an enabler which helps supply chain members to establish partnerships for better performance. Some of the ICT potential applications for supply chain integration are; electronic data interchange (EDI), Internet and enterprise systems such as enterprise resource planning (ERP) and radio frequency identification (RFID) (Gunasekaran, 2004).

As information technology becomes the main tool for business process in the supply chain management, it has several importances in different aspects of its tasks. IT application moves from data management to control automation, and then moves to enterprise integration (Li, 2005).

Li (2005) highlighted the importance of ICT tools as; the implementation of IT tools through the supply chain brings efficiency, responsiveness and accuracy on the flow of information throughout the supply chain. However, it was only at the time when the Internet technology became a practical means of information exchange in industries, that supply chain management started changing its way of allocating and controlling resources across organization boundaries.

Fasika *et al* (2014) highlighted even though, the selection of the available ICT and cost associated with their implementation is still challenging tasks, the manufacturing industry needs to adopt appropriate ICT tools to leverage their business advantage. They also added that; Effective utilization of ICT tools will enable the manufacturing companies a better option in their global supply chain integration efforts.

2.4. Conceptual framework

The effect of globalization brings the high interest of integrating supply chain process instead of dealing with business organizations' internal boundary but focusing end-to-end integration from supplier to customer. Organizations should implement tools like ICT to enhance their business advantage. Effective and efficient utilization of ICT tools will provide manufacturing enterprises a better option in their global supply chain integration efforts (Hill, 2000).

The benefit of supply chain management will be maximized when the integration among companies (Suppliers, Customers and other intermediate value adding enterprises) within the chain is efficient and effective. In this regard, many research suggested that the higher level of integration with suppliers and customers in the supply chain benefits all at greater extent (Fasika, *et al*., 2014)

Upstream and upstream supply chain integration requires technological integration primarily with main

supplier and customer which has positive impact on overall monitoring and collaboration among the business entities within the supply chain. Supply chain integration can also encourage business firms for information sharing, collaboration and cooperation among them which enhance ultimate customer satisfaction (Akkermans, *et al*., 1999).

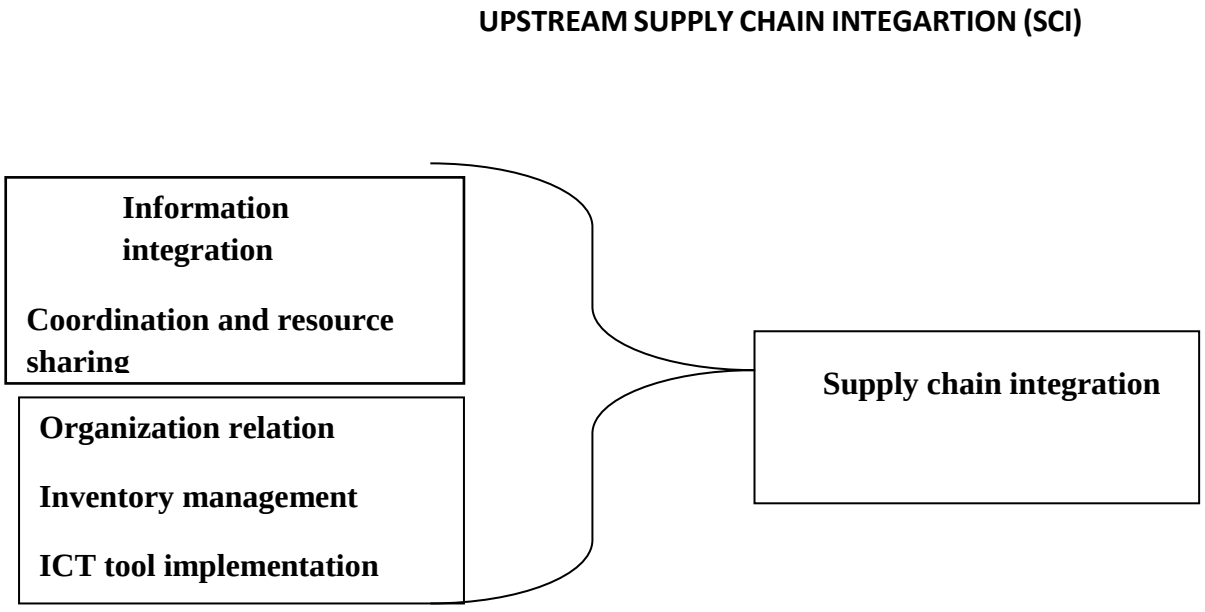
In this upstream supply chain integration, information integration, coordination and resource sharing and organizational relation linkage are the main issues to be considered.

Information integration is a collaboration and collective responsibility across functions from product design to distribution to address customer requirements at a low total system cost (Zheng ct al. 2000; Fischer. 1997). The physical flow of products and fund in the supply chain become highly dependent on information technology as the result these technologies can also become enabler of further cooperative arrangement among the supply chain partners (Damien, 2005). Effective application of information technology to the integration of supply chain activities has the effect of reducing levels of complexity (Forrester, 1958).

As per Flynna *et al*. (2010) description, the supply chain integration is a building block comprised of bricks of joint collaboration, high level of coordination, shared vision, shared information and technical infrastructure between manufacturer and distributors (Barbara, *et al*., 2010). Coordination indicates an interactive, joint decision making process, where separate entities influence each other's decisions more directly (Moharana, *et al*., 2012). In era of globalization supply chain relationships and procedures must be aligned and integrated with business strategy so that the ultimate purpose of customer satisfaction and value addition to company value delivery network should be implemented (Raja Irfan Sabir, 2014). Fast Communication channels among the members of supply chain help in framing business policies, goal alignment and achievement of tasks timely (Ross, 2010).

Implementing an agile and lean Supply chain integration may face different challenges internally as well as externally, with respect to integrating supply chain specific strategies with the overall corporate business strategy (Award & Nassar, 2010). In recent years, along with the change in business realities related to globalization and modernization, the supply chain has got the first priority on top management of the business entities and they pay attention to cut costs and to bring their competitive advantage to satisfy their customers (Award & Nassar, 2010).

Therefore, based on the network theory, the extent of upstream supply chain integration level, benefits, coordination among stakeholders, challenges or barriers of supply chain integration in Abat and mehari products has been assessed and analyzed.



Source; Developed by the researcher (2025GC)

Figure 1; Conceptual framework of the study

CHAPTER THREE
RESEARCH METHODOLOGY

3.1.Introduction

In order to investigate the association of strategic customer partnership(upstream customer integration) in supply chain integration in case of Abat &Mehari agro processing plc flour factory so the study section would provide an over view of the study research approach which lays within the method strategy. The chapter was discussing procedures and activities under taken on sampling strategy, data processing and questionnaire deign, data collection. Besides, the section deals with a discussion on ethical issues and the study profile.

3.2. Description of the study area

Debre Markos is the capital city of East Go jam zone in Amara national regional state.It is located 295 Km away from the North West of Addis Ababa, the capital city of Ethiopia, having a total area of 65.82 Kilo meter square, latitude and longitude of10°3296′N37°.7344′E and an elevation of 2,446 meters.

Debre Markos town map

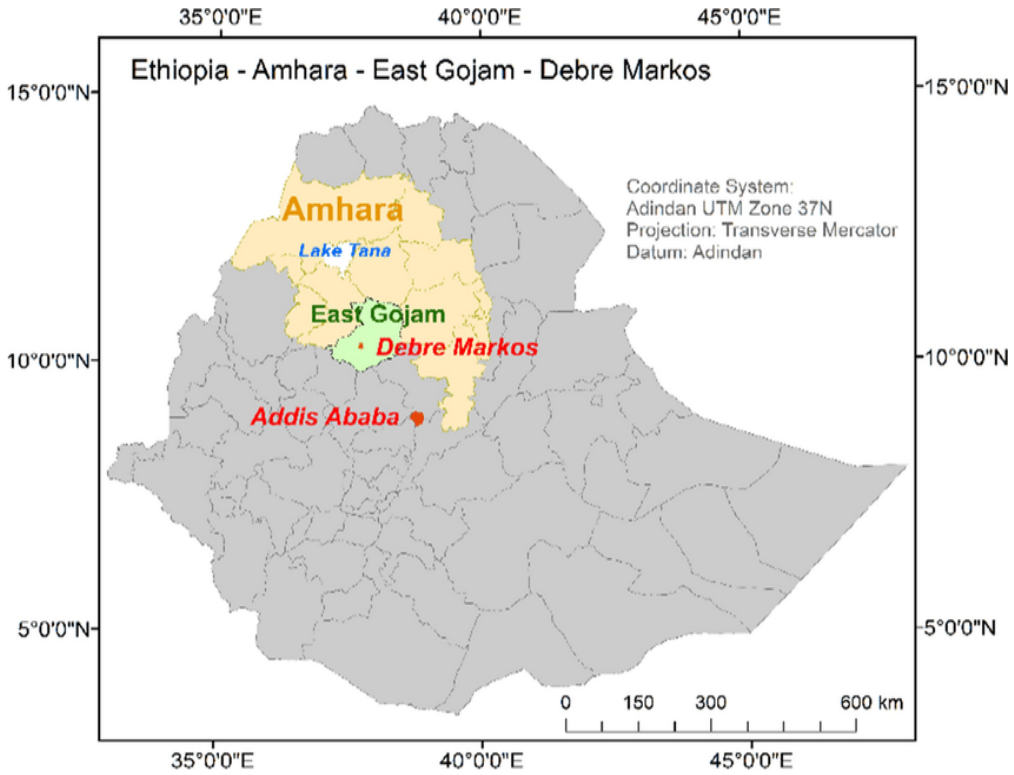


*Figure 2; Map of Debre Markos town*Table 1: Population sampleTable 2: Relaiabilty Analysis

3.1. Research Approach

According to Ghauri and Kjell (2005), there are two research approaches such as quantitative and qualitative approach, where one of them is not better than the others, all of this depends on how the researcher want to do a research study. The study conducted using both qualitative and quantitative research approach. The rationale for using quantitative data is to better understand a research problem by numeric values from quantitative research. The objective of quantitative research is to determine the relationship between an independent variable and a dependent outcome in population numerically (Hopkins, 2008).

3.2. Research Design

For this study the researcher used both descriptive and explanatory research designs to analyze the data. According to Kothari (2004), descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual or of a group.

Thus the researcher used descriptive design to determine the natures of variables based on mean and standard deviations whereas explanatory research design establish to show causal relationship between variables that may be termed explanatory studies here is on studying the problem in order to explain the effect of independent on dependent variable (Saunders et al, 2007).

3.3.Sample Size Determination and population

The population of the study covered Abat and mehari agro processing plc upstream supply chain partners including the (Gozamin union, ghion union employees)

"Sampling is the process or technique of selected a suitable sample for the purpose of determining parameters or characteristics of the whole population" (Adams, et al., 2007). This research conducted used simple random sampling method

Because of the large number of the sample unit, time and cost constraint, the sample was drawn from the target population by used simple random sampling method. Accordingly, in this study to make the sample more representatives, the sample size of the study determined use the formula adopted from Kreijcie and Morgan's (1970). Thus, the formula used to calculate the sample size is

Simplified formula for proportions i.e.

$$n=N/1+N\ (e^2)$$

Where n= the sample size

N= the population size

e= the accepted sampling error (level of significance)

- at 95% confidence level is equal to 0.05 For this particular research

n= 286/1+286(.05×.05) n= 167

.3.4.Sampling Technique

The study used simple stratified random sampling method to select the study population.

For selecting sample from each upstream partner stratified random sampling was used. The study populations were segmented on the basis of sectors this comprised of: abat and mehari, gozamin union, gihon union. The main purpose of stratification is to reduce sampling error, in order to increase efficiency. It involves the division or stratification of a population by partitioning the sampling frame in to non-overlapping and relatively homogeneous groups.

Table 3: Population sample

No	List of departments	Target Population of each Stratum	Sample size from each Stratum
1	Abat and Mehari agro processing plc.	80	$n_1 = = \frac{167 \times 80}{286} = 46$
2	Gozamin union plc.	145	$n_2 = = \frac{167 \times 145}{286} = 83$
3	Ghion union	61	$n_3 = = \frac{167 \times 65}{286} = 38$
Total		286	167

Source: Own Survey on Census Taken from Each department (october, 2024)

3.5. Source of Data Collection

The study used primary data. According to Sekaran (2010), Primary data is the data which is gathered for the purpose of the research specifically. This research project used primary data as the principal source of information. As the unit of analysis was the individual, the researcher was interested to collect original data from a population and measuring the perceptions of individuals. A survey is deemed the most suitable design to achieve the objectives of the research.

3.6. Data Collection Procedure

Data collection instrument was basically primary data which started after getting permission from the organization. The instrument used in this study was a close-ended questionnaire that will adapt from the review of related literature. The researcher collect Primary source of data through closed ended questionnaires of the 1-5 likert scale (strongly agree to strongly disagree) measurement of the variables which included on the study.

The researcher used ordinal level of measurement. At this level numbers will assign to cases specify only the order of cases permitting greater than and less than distinctions (Engel and Schutt, 2014). Therefore, the study used five-point Likert scale to measure variables since it support such relationship. The Likert scale use in this study will consider as categories, not numerical points such as 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=strongly

Agree which allows respondents to indicate level of agreement with the statement provided in the questionnaires.

3.7. Method of Data Analysis

Data analysis refers to examining what has been collected in a survey or experiment and making deductions and inferences. Prior to analysis of the data, the researcher will carry out data cleaning. Data cleaning procedure enabled the researcher to spot and eliminate all errors emanating from unclear responses, omission of unwanted data and other related mistakes (Donald and Delno, 2006).

After data collection from survey questionnaire will be made the researcher entered into SPSS (statistical package for social science) software, version 27 for analysis. Data that would collect using questionnaire analyzed through descriptive statistics like: frequency, mean, standard deviation and inferential statistical methods such as: correlation and regression for the cause and effect relationship of variables.

In descriptive statistical analysis, the researcher could use to conduct demographic profile of the study participants and to assess implementation level of total quality management practice. The correlation analysis of this study would be conduct to test the proposed hypothesis whether there is a positive significant relationship between the total quality management practice and non-financial performance.

The multiple regression models' is applicable as follows:

$$Y= \beta0+\beta1x1+ \beta2x2+ \beta3x3+ \beta4x4+\beta5x5+ \varepsilon$$

Where: Y= Dependent Variable (supply chain integration)

β0= constant term; β1, β2, β3, β4, = Beta coefficient

X1= Collaboration and resource sharing
X2= practice of organizational relation linkage
X3= Ict utilization and information
X4= inventory strategy

X5= information integration
ε=the residual value/error term

Validity and Reliability of the Instruments

3.7. Validity

Validity refers to whether an instrument measures what it was designed to measure. According to Hair et al. (2007), validity defined as "the degree to which a measure accurately represents what is supposed to". It also refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration. The study adopted construct validity approaches of validity to ensure validity of measurements.

3.8.Reliability

Reliability estimates the consistency the measurement or more simply, the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. Reliability is essential about consistency, if we measure something many times & the result is always the same, and then we can say that our measurement is reliable (John et al., 2010).

Reliability (internal consistency) Analysis: Reliability of data tested using the Cronbach's alpha. The reliability and internal consistency of the data are measured by the Cronbach's Alpha coefficient. Gerge and Mallery (2003) provides the following rules of thumb: α>0.9, Excellent, α>0.8 Good, α>0.7 Acceptable and 0.6 α <0.7 questionable α>0.5 poor and α<Unacceptable. Accordingly, to Field (2007) the reliability is regarded to be satisfactory when the Alpha Coefficient is equal to or exceeds 0.7)

Table 4:Relaiability Analyisis

Variable	Cronbach's Alpha coefficient score	No. of Items	Comments
Collaboration and resource sharing	0.909	8	Acceptable
Information integration	0.895	5	Reliable
practice of organizational relation linkage	0.856	4	Reliable
Ict utilization and information	0.869	5	Reliable
Inventory managment	0.854	7	Reliable
Supply chain integration	0.871	8	Reliable
Overall Reliability	**0.868**	7	

Table 2: Reliability Analysis

3.1 Ethics in Research

According to Leedy and Ormrod (2010), most ethical issues fall into one of the following four categories; informed consent, confidentiality, security and honesty. Therefore, the researcher considered all these issues in the questionnaire guidelines in the following manner:

- **Informed consent:** all participants will briefly inform about the reason of conducting such study therefore enabled them to join with full consent.
- **Right to privacy (confidentiality):** the researcher will keep the nature and quality of participants' performance strictly confidential. No information will record to link respondents with their responses.
- **Security:** the researcher will not expose the participants to unusual stress, embarrassment, or loss of self-esteem.
- **Honesty:** The researchers will report the findings in complete honesty.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presented the findings of the research in accordance to the research objectives. The analyses and interpretation of the data collected from the respondents is presented. It began with description of the demographic respondents. The Cronbach's alpha coefficients for reliability were examined. Then, the results of correlation analysis and regression analysis for the research variables were also discussed.

4.2 Questionnaire Response Rate

A total of 167 questionnaires were distributed to employees, 163 of them were correctly filled and returned, an overall response rate of (97%). According to Rogelberg and Stanton (2007) and Saunders *et al.* (2007), a response rate of 50% is adequate; a rate of 60% is good and a response rate of 70% and above is very good. Therefore, the response rate in this study was considered to be very good for the study.

4.3.Demographic Description of Respondents

Demographic characteristics are very important indicators of performance in any organization and are the basis for research questionnaire turnout. Even though demographic characteristics are not having great influence on this study, the researcher considers some of them which are believed to have correlation to the study. Hence, the demographic characteristics of gender, age, education, work experience, marital status and position at the companies are emphasized.

Table 5;Sex of respondents

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	87	53.4	53.4	53.4
	female	76	46.6	46.6	100.0
	Total	163	100.0	100.0	

Source: - Researcher Own Survey (2025)

From the above table 3 we can see that, 87 (53.4%) of respondents are male whereas 76(46.6%) of respondents were female. Based on this, the numbers of male employees surpass female employees in the organization. Regarding to this proportion of gender it can expected both female and male had the abilities to express the impact of upstream supply chain practices of Abat and Mehari plc.

Table 6: Education Status of the Respondents

education level		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	primary education	18	11.0	11.0	11.0
	secondary education	87	53.4	53.4	64.4
	diploma	51	31.3	31.3	95.7
	Bachelor degree and above	7	4.3	4.3	100.0
	Total	163	100.0	100.0	

Source: - Researcher Own Survey (2025)

As indicated in table 4 above, it showed clearly almost hall of the participants are possessed secondary education and 51(31.3%). are diploma holders, 50(16.1%) are secondary education and 18(11%) primary education .Therefore, this implies that the majorities of respondents are educated and had the ability to understand the questions they were presented with in regard to upstream supply chain practices of abat amd mehari plc. The respondent's education status increases the perceptions of supply chain integration and also has the abilities to identify the challenges and factors affecting supply chain integration performance of their manufacturing company.

Table 7;Age of Respondents

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-23	38	23.3	23.3	23.3
	24-29	78	47.9	47.9	71.2
	30-35	8	4.9	4.9	76.1
	36-41	20	12.3	12.3	88.3
	41 and Above	19	11.7	11.7	100.0
	Total	163	100.0	100.0	

Source: - Researcher Own Survey (2025)

As indicated in the table 5 it indicates that, 78(47.9%) of respondents are age groups of between 24-29 years followed by 38(23.3%) of respondent in the age group of 18-23, 20 (12.3%) are in the age group of 36-41, 38(12.3%) of respondents are between 41 and above and the last 8(4.9%) are between 30-35 years. Regarding to this we can conclude that majority employees of the companies are young with age group of 24-29 that means 78(47.9%) and this would enhance the companies to have energetic and experienced employees to accomplish their company goals.

Table 8:Work experience of respondents

work experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<2 years	7	4.3	4.3	4.3
	2-7 years	53	32.5	32.5	36.8
	8-14 years	63	38.7	38.7	75.5
	above 15	40	24.5	24.5	100.0
	Total	163	100.0	100.0	

Source: - Researcher Own Survey (2025)

As shown in table 5 as indicated above, a large number of respondents work experience lies between 8 to 14 years 63 (38.7%), followed 2 to 7 years 53(32.5%) ,17(9.44%) and above 15 years 40(24.5%). Only few respondents work experience is less than 2 year 7 (4.3%). Therefore, since majority of respondents lie above 8 to 14 years of work experience, this shows that the respondents are well knowledgeable about overall activities of their company and supply chain integrations.

4.4. Descriptive Analysis

4.2.1 Mean and Standard deviations

Neil J. Salkind (2010) Mean is a parameter that measures the central location of the distribution of a random variable. A standard deviation is a statistic that measures the dispersion of a dataset relative to its mean. Descriptive statistics (mean and standard deviations) of the respondents' scores were computed and analysis has been done by comparing these mean scores and standard deviations among respondents. The reason for using descriptive statistics is to distinguish factors affecting upstream supply chain integration practices in case of Abat and Mehari Agro processing plc by using means and standard deviations values. Respondents were asked to rate their insight on a five-point Likers scale ranging from 1 being ''Strongly Disagree'' to 5 ''Strongly Agree'' Accordingly, the result of descriptive statistics (mean and standard deviation) of each variable is presented in the table below.

With the objectives of interpretation of the above descriptive data, the researcher adopted measurement scale intervals or range from Poonlar Btawee, 1987 as cited by Hailu Demissie (2014). Based on Btawee, mean scores ranging from 4.51 to 5.00 consider as "excellent or very good", 3.51- 4.50 as "good", 2.51-3.50 as "average or moderate", 1.51-2.50 as "fair" and 1.00-1.50 as "poor" (Hailu Demissie, 2014).

The summary statistics of all the variables in this study is presented as in the following table 4.8 shows that there are 163 observations for each variables, the mean and standard deviation value.

Table 6 Descriptive statistics summary of upstream supply chain practices and supply chain integration performance

Table 9:Descriptive stastics summary of Upstream supply chain practices

Variables	**N**	**Mean**	**Std. Deviation**
Information integration	163	2.53	0.79
Coordination and resource sharing	163	4.01	1.02
Organizational relation	163	3.18	1.02
It tool implementation	163	3.68	0.94
Inventory management	163	2.25	.682
Upstream Supply chain integration	163	2.71	.738

Source: - Researcher Own Survey (2024)

Information Integration

Mean = 2.53: The average score for information integration is 2.53, which indicates a relatively low level of integration.

Standard Deviation = 0.79: The spread of responses around the mean is moderately spread out, suggesting a fair degree of variability among participants.

Coordination and Resource Sharing

Mean = 4.01: This dimension has the highest average score, suggesting that the respondents perceive a relatively high level of coordination and sharing of resources within the organization or supply chain.

Standard Deviation = 1.02: This value indicates that there is a higher variability in the responses compared to other dimensions.

Organizational Relation

Mean = 3.18: The mean score here is moderate, indicating that organizational relationships are neither particularly strong nor weak, but somewhat average.

Standard Deviation = 1.02: The spread of responses is quite wide, indicating variability in how organizational relations are perceived.

IT Tool Implementation

Mean = 3.68: This dimension has a fairly high average score, which suggests that IT tools are implemented at a moderate to high level in the organization.

Standard Deviation = 0.94: The standard deviation indicates moderate variability in the responses, meaning that some respondents perceive IT tool implementation to be better than others.

Inventory Management

Mean = 2.25: This is the lowest mean, indicating that inventory management is perceived as being relatively weak or underdeveloped within the organization.

Standard Deviation = 0.68: The lower standard deviation suggests that responses are relatively consistent, indicating a common perception of weak inventory management.

Upstream Supply Chain Integration

Mean = 2.71: The mean score here suggests that upstream supply chain integration is relatively low but not the lowest (inventory management is). This indicates that integration efforts are somewhat underdeveloped in this area.

Standard Deviation = 0.738: This value indicates a moderate level of consistency in responses regarding the level of integration

The highest rated dimension is Coordination and Resource Sharing (Mean = 4.01), indicating a strong perception of inter-organizational coordination.

Information Integration and Inventory Management have the lowest scores (Means of 2.53 and 2.25, respectively), highlighting areas where there may be significant room for improvement.

IT Tool Implementation (Mean = 3.68) and Organizational Relation (Mean = 3.18) are seen at moderate levels, suggesting that these aspects are somewhat developed but could be further optimized.

Upstream Supply Chain Integration is also moderately low, similar to information integration, suggesting that improving integration could enhance overall performance.

The standard deviations show that there is some variability in perceptions across the sample, indicating differing views on the implementation of these dimensions.

4.5. Inferential Analysis

Like the descriptive statistical methods, i.e. demographic and other related factors, the scale typed questionnaire has been entered to the SPSS software version 27 and inferential statistics methods such as: simple correlation and multiple regression methods has been employed to test

4.5.1. Correlation Analysis

Pearson correlation test was conducted to know the degree of relationship between the independent variables i.e. information integration, coordination, inventory management, organization relation, ict tool implementation and dependent variable i.e. supply chain integration. Based on the questionnaires which were filled by the employees and the results of correlation analysis between these variables are shown in table below.

		II	CO	OR	ITIM	IM	SCI
II	Pearson Correlation	1	.112**	.112**	.172*	.102	.202**
	Sig. (2-tailed)		.049	.000	.021	.175	.030
CO	Pearson Correlation	.147*	1	.154*	.775**	.807**	.278**
	Sig. (2-tailed)	.049		.000	.000	.000	.000
OR	Pearson Correlation	.312**	.354**	1	.266*	.362**	.330**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
ITIM	Pearson Correlation	.172*	.775**	.466**	1	.883**	485**
	Sig. (2-tailed)	.021	.000	.000		.000	.000
IM	Pearson Correlation	.102	.807**	.362**	.883**	1	411**
	Sig. (2-tailed)	.175	.000	.000	.000		.000
SCI	Pearson Correlation	.162*	.773**	.420**	.752**	.797**	1
	Sig. (2-tailed)	.030	.000	.000	.000	.000	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 7 Pearson Correlation Analysis

Source: - Researcher Own Survey (2025)

Information Integration (II):

Pearson Correlation = 0.202, Sig. (2-tailed) = 0.030 (significant at the 0.05 level)

Interpretation: There is a weak positive correlation between Information Integration and Upstream Supply Chain Integration. The correlation is statistically significant, suggesting that as information integration improves, and upstream supply chain integration tends to improve slightly, though the effect is modest.

Coordination and Resource Sharing (CO):

Pearson Correlation = 0.278, Sig. (2-tailed) = 0.000 (significant at the 0.01 level)

Interpretation: There is a moderate positive correlation between Coordination and Resource Sharing and Upstream Supply Chain Integration. This relationship is statistically significant, implying that better coordination and sharing of resources are associated with stronger upstream supply chain integration.

Organizational Relations (OR):

Pearson Correlation = 0.330, Sig. (2-tailed) = 0.000 (significant at the 0.01 level)

Interpretation: A moderate positive correlation exists between Organizational Relations and Upstream Supply Chain Integration, which is statistically significant. This suggests that stronger organizational relations are associated with better integration in the upstream supply chain.

IT Tool Implementation (ITIM):

Pearson Correlation = 0.752, Sig. (2-tailed) = 0.000 (significant at the 0.01 level)

Interpretation: There is a strong positive correlation between IT Tool Implementation and Upstream Supply Chain Integration, and the relationship is highly statistically significant. This indicates that more effective implementation of IT tools leads to significantly better upstream supply chain integration.

Inventory Management (IM):

Pearson Correlation = 0.797, Sig. (2-tailed) = 0.000 (significant at the 0.01 level)

Interpretation: A very strong positive correlation exists between Inventory Management and Upstream Supply Chain Integration, and this correlation is statistically significant. This suggests that more effective inventory management is strongly associated with better upstream supply chain integration.

Key Findings:

IT Tool Implementation (ITIM) and Inventory Management (IM) show the strongest correlations with Upstream Supply Chain Integration (DSCI), both with a correlation coefficient of around 0.75 to 0.80, and these relationships are highly statistically significant.

Coordination and Resource Sharing (CO) and Organizational Relations (OR) also show moderate positive correlations with Upstream Supply Chain Integration (DSCI), indicating that these factors still play a notable role in influencing supply chain integration.

Information Integration (II) has the weakest correlation with Upstream Supply Chain Integration (DSCI), though it is still statistically significant.

Conclusion:

IT Tool Implementation and Inventory Management are the strongest predictors of Upstream Supply Chain Integration, with strong and significant positive relationships. These dimensions should be prioritized for organizations seeking to improve supply chain integration.

While Coordination and Resource Sharing, Organizational Relations, and Information Integration also show positive correlations, they are weaker in comparison and may require further focus to enhance their impact on upstream supply chain integration.

4.5.2. Multiple Regression analysis

Regression analysis describes the proportion of variation in one dependent variable accounted for by the other independent variable (Greener S, 2008). In this study multiple regression analysis used to see the relationship between upstream supply chain integration and its variables and to test the hypothesis stated in the previous chapter. However, it was necessary to carry out diagnostic tests to confirm whether the data collected fitted well in the model.

4.5.2.1 Tests for the Multiple Linear Regression Model Assumptions

The basic assumptions should be satisfied in order to maintain data validity and robustness of the regressed result of the research under the multiple regression models. Hence this study has conducted the assumption tests such as, Normality, Linearity, Homoscedasticity and Multi-collinearity tests.

4.5.2.1.1 Normality Test

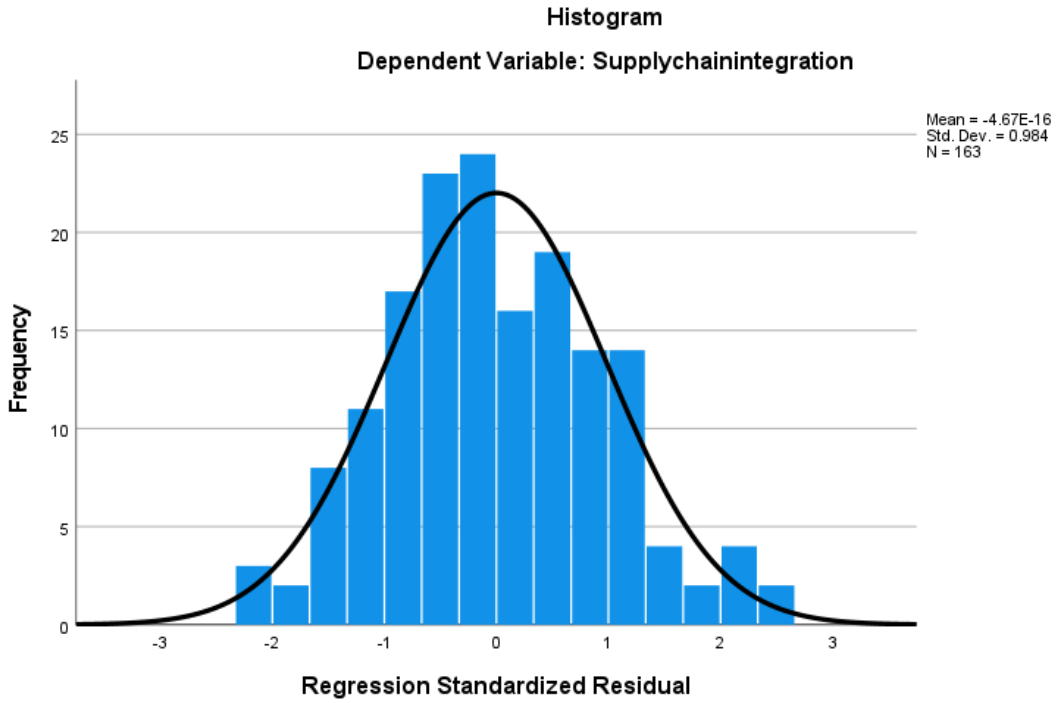
Normality was tested using Shapiro-Wilk test, which has the ability to detect departure from normality. Its statistic ranges from zero to one and figures $p > 0.05$ indicates the data is normal (Razali & Wah, 2011). Shapiro-Wilk test assesses whether data is normally distributed against null hypothesis (H_0) that the sample does not follow a normal distribution. The results are as presented in Table 8

Table 10: Shapiro -wilk Test

Variables	Shapiro-Wilk		
	Statistic	DF	Sig.
Information integration	.930	310	.06
Coordination and resource sharing	.967	310	.09
Organizational relation	.891	310	.12
It tool implementation	.911	310	.09
Inventory managment	.839	310	.06
up stream Supply chain integration	.950	310	.08
Information integration	.948	310	.07

Source: - Researcher Own Survey (2025)

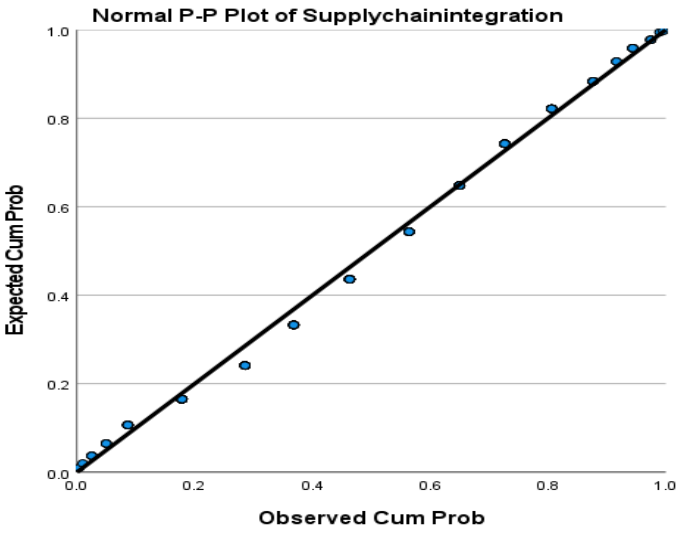
All the variables tested (Information Integration, Coordination and Resource Sharing, Organizational Relation, IT Tool Implementation, Inventory Management, and Upstream Supply Chain Integration) show p-values >0.05, meaning that all of the variables are normally distributed according to the Shapiro-Wilk test.



4.5.2.2 **Linearity Test**

In the Normal Probability Plot it will be hoped that points reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality. The study applied Normal P-Plot of regression Standardized Residua l (See Figure 2) to test linearity.

Figure 2: Normal



Point Plot of Standardized Residual

Source: - Researcher Own Survey (2025)

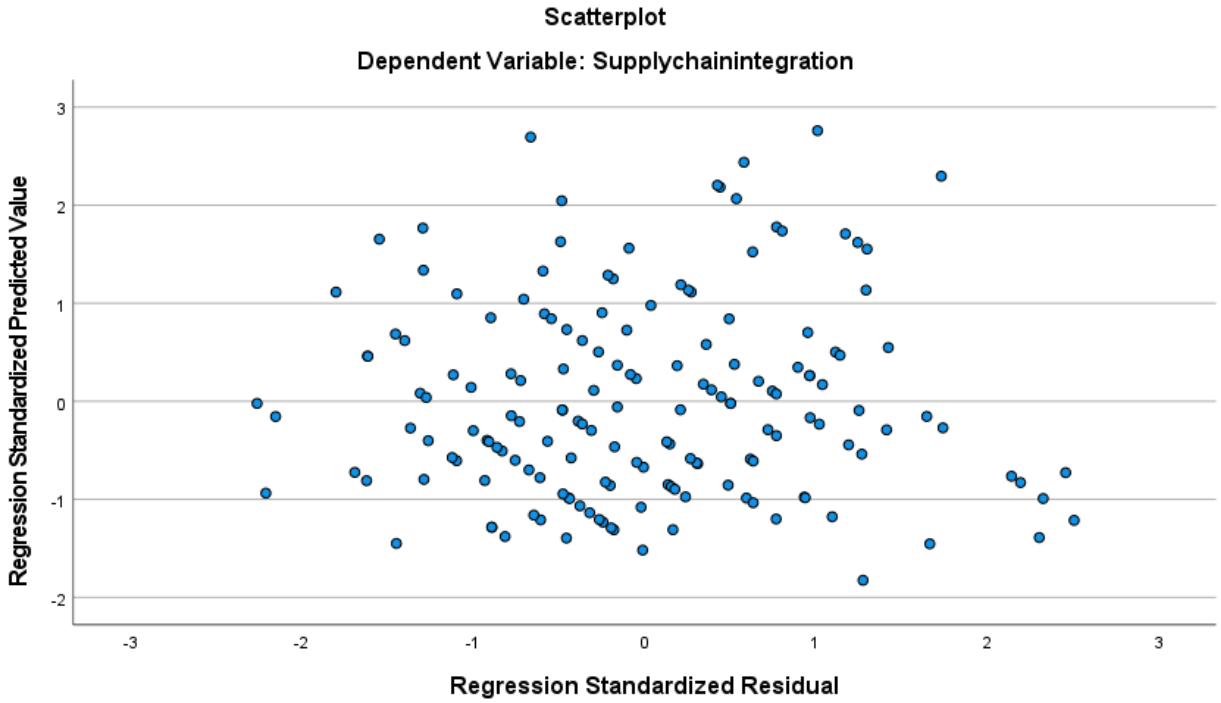
From the above figure 2 we concluded that the points were symmetrically distributed around diagonal line, linearity pattern was observed. Hence, the straight line relationship between the residuals and the predicted dependent variable scores depicted that linearity was achieved.

4.5.2.3 **Homoscedasticity Test**

Homoscedasticity is the extent to which the data values for the dependent and independent variables have equal variances, as Saunders, et al. (2009) noted. Homogeneity of variances assumes that the dependent variable exhibits equal variance across the range of predictor variables.

If the variances in the two groups are different from each other, then adding the two together is not appropriate and will not yield an estimate of the common within-group variances. Therefore, for this test scatter plot was used to measure the equality of variances for the variables.

Figure 3 : Scatter Plot



Using the plots of ZRESID against ZPRED, the researcher tried to check whether the graph looks like a random array of dots evenly dispersed around zero because the Testing for Homoscedasticity lies with an assumption in regression analysis that the residuals at each level of the predictor variable(s) have similar variances. This is to mean that at each point along any predictor variable, the spread of residuals should be fairly constant. The plot in the above figures 3 shows that how the points are randomly and evenly dispersed throughout the plot. And, these patterns are indicatives of a situation in which the assumption of linearity and homoscedasticity have been met in whole the six independent variables against non-financial performance.

4.5.2.4 **Multi-collinearity test**

According to Field (2009), multicollinearity was not a problem as long as the variance inflation factor (VIF) was lower than 10 and the tolerance statistic was greater than 0.10. The variance inflation factors for all independent variables were under 10; therefore, a multicollinearity problem was not observed. To this end,

the five independent variables measuring upstream supply chain practices were regressed against the dependent measure of the supply chain integration.

Before proceeding to the multiple regression analysis; the researcher tested the existence of a multicollinearity problem. Thus, to indicate whether multi collinearity was violated, the tolerance and VIF were evaluated as can be seen from the following table

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Information integration	.890	1.124
coordination	.872	1.146
Organizational relation	.917	1.090
IT tool implementation	.656	1.524
Inventory management	.718	1.394

Table 11; Multicollinearity Table

AS shown in the above table 9, the tolerance values for each of the scales of the variables ranged from 0.656 to .917 which are greater than .10; thus, further verifying that the assumption is not violated. No multicollinearity was also verified by the VIF values that ranged from 1.090 to 1.524 which are less than 10.

4.6. Regression Result and Hypothesis Testing

Multiple regressions are the most common and widely used to analyze the relationship between a single dependent variable and multiple continues on categorical independent variable (George et al, 2003). In this study multiple regression analysis was employed to examine the factors towards information integration, organizational relation, coordination, IT tool implementation and inventory management on the upstream supplychain integration. The following table presents the results of multiple regressions analysis. Here the squared multiple correlation coefficients (R^2) which tells the level of variance in the dependent variable (upstream supply chain integration) that is explained by the model.

Table 12; Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.636[a]	.404	.385	.57901

Source: - Researcher Own Survey (2024)

Predictors: (Constant), Inventorymanagment, coordination, organizational relation, Information integration, It tool implementation

In table 10, the coefficient of correlation (R) of the variables as a whole, fitness of the model (R2), adjusted R Square (adj.R2) and standard error of the estimate were computed using SPSS software and these were interpreted here. However, the coefficients of determination of each independent variable were described separately in table 11. In the column labeled R (correlation coefficient) were the values of the multiple correlation coefficients between the predictor and the outcome. When the five-predictor variables were used at once, the relation between the independent and dependent variables will be 0.636

The next column gives us a value of R^2 (coefficient of determination) or fitness of the model , which was a measure of how much the variability in the outcome was accounted for by the predictors or the percentage of the dependent variable explained by the independent variables.

Therefore, the value was 0.636 Inventory management, coordination, organizational relation, Information integration, It tool implementation account for 63.6% of the variance in upstream supply chain integration. The adjusted R2 gives idea of how well the model generalizes and ideally it would be good its value to be the same, or very close to, the value of R2.

Table 13; Analysis of Variance(Anova)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.737	5	7.147	21.320	.000b
	Residual	52.634	157	.335		
	Total	88.371	162			

a. Dependent Variable: Upstream Supply chain integration

b. Predictors: (Constant), Inventorymanagment, coordination, organiztionalrelation, Information integration, Ittoolimplementation

Table 4.6 Significant of Independent Variables on Dependent Variable

Source: - Researcher Own Survey (2025)

Similarly, the ANOVA Table 11 above shows the overall significance/acceptability of the model from a statistical perspective. As the significance value of F Statistics shows a value (.000), which is less than

p<0.05, the model is significant. This indicates that the variation explained by the model is not due to chance. As it is stated in the objective of this study, this study aims to identify the most contributing independent variables in the prediction of the dependent variable. Thus, the strength of each predictor (independent) variable influence on the criterion (dependent) variable can be investigated via unstandardized Beta coefficient. The regression coefficient explain the average amount of change independent variable that caused by a unit of change in the independent variable. The larger value of Beta coefficient that an independent variable has, brings the more support to the independent variable as the more important determinant in predicting the dependent variable.

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.285	.396		5.777	.000
	Information integration	.226	.060	.244	3.733	.000
	coordination	.196	.049	.266	4.037	.000
	organiztionalrelation	.161	.046	.224	3.488	.001
	Ittoolimplementation	.189	.059	.241	3.175	.002
	Inventorymanagment	.262	.087	.219	3.011	.003

a. Dependent Variable: Upstream Supply chain integration

Source: - Researcher Own Survey (2025)

4.7. Regressions coefficient result

Based on the above regression analysis result table, we can conclude on interpretation of individual effect of the predictors.

The Unstandardized coefficients of beta show the effect of independent variables on upstream supply chain by the given amount in the above table 4.7. The regression equation above shows that, by taking all factors into account constant at zero, the upstream supply chain in the companies had the value of 0.436

- ☞ If Information integration increases by 1 percent by considering all factors as constant, upstream supply chain integration was increase by 22.6 %. Regarding to this, the researcher confirms that Information integration had a positive effect on non-financial performance.
- ☞ When coordination and resource sharing increases by 1 percent, upstream supply chain integration performance was increase by 19.6 %. Regarding to this, the researcher confirms that coordination and resource sharing had a positive effect on upstream supply chain integration
- ☞ If organizational relation increases by 1 percent, upstream supply chain integration was increase by 16 %. Thus, the researcher confirms that organiztionalrelation had a positive on upstream supply chain integration.
- ☞ If Information technology implementation increases by 1 percent, upstream supply chain integration.
- ☞ Was increase by 18.9 %. Thus, the researcher confirms that Information technology implementation has a positive effect on upstream supply chain integration Based on the above finding the study could develop the following multiple regression model.

If inventory management increases by 1 percent, upstream supply chain integration was increase by 26.2 %. Thus, the researcher confirms that inventory management had a positive on upstream supply chain integration.

DSI= β_0 + β1II1+ β2CO+ β3OR+ β4ITIMP+ β5IM+ ε

Where, DSI = upstream supply chain integration

β_0 = Constant

β = Coefficient of estimate

II = Information Integration

ITIMP =IT Implementation

CO= Coordination and resource sharing

OR = Organizational relation

IM=Inventory management

ε = the error term

Based on this we can rewrite the mathematical the model equation as follows,

DSI=.

dependent Variable=2.285+0.226(Information Integration)+0.196(Coordination)+0.161(Organizational R+0.189+Ittooimplementation+0.262 inventory management

4.8. Discussion of finding

The unstandardized coefficients (B) provide the magnitude of change in Upstream Supply Chain Integration for each unit change in the corresponding independent variable. The standardized coefficients (Beta) allow us to compare the relative importance of each independent variable. Here are the key findings from the regression table:

Constant (2.285):

This is the baseline value of Upstream Supply Chain Integration when all independent variables are zero. It doesn't hold much significance on its own, but it helps to define the starting point of the regression equation.

Information Integration (B = 0.226, Beta = 0.244):

Interpretation: A one-unit increase in Information Integration is associated with a 0.226 increase in Upstream Supply Chain Integration, holding other factors constant.

The standardized coefficient (Beta = 0.244) indicates a moderate positive impact of Information Integration on Upstream Supply Chain Integration, suggesting that improving the flow of information across the supply chain can improve supply chain integration.

Empirical Comparison: In similar studies, the importance of information sharing and integration has been consistently recognized as a driver of supply chain performance (e.g., Kim et al., 2011; Lee, 2004). Effective information integration helps reduce uncertainty and enables better decision-making, which supports the findings of your study.

Coordination (B = 0.196, Beta = 0.266):

Interpretation: A one-unit increase in Coordination and Resource Sharing leads to a 0.196 increase in Upstream Supply Chain Integration.

The standardized Beta coefficient of 0.266 shows that Coordination has a moderate positive effect on upstream supply chain integration, which emphasizes the importance of collaborating with partners to optimize the supply chain.

Empirical Comparison: This result aligns with research that highlights the role of collaboration and coordination in enhancing supply chain efficiency (e.g., Choi & Krause, 2006; Mentzer et al., 2001). Effective coordination reduces redundancies and enhances the flow of goods and information.

Organizational Relation (B = 0.161, Beta = 0.224):

Interpretation: A one-unit increase in Organizational Relation is associated with a 0.161 increase in Upstream Supply Chain Integration.

The Beta of 0.224 suggests that Organizational Relations play a moderate role in improving supply chain integration. Strong relationships between partners in the supply chain improve communication and foster trust.

Empirical Comparison: Similar findings have been reported by studies focusing on the importance of trust and collaborative relationships in improving supply chain integration (e.g., Dyer & Singh, 1998). Trust reduces the perceived risk in supply chain relationships, which can lead to more effective collaboration and integration.

IT Tool Implementation (B = 0.189, Beta = 0.241):

Interpretation: A one-unit increase in IT Tool Implementation leads to a 0.189 increase in Upstream Supply Chain Integration.

The Beta coefficient of 0.241 highlights the moderate impact of IT tools on supply chain integration. IT tools, such as enterprise resource planning (ERP) systems, improve the flow of information and coordination across the supply chain.

Empirical Comparison: The positive relationship between IT tools and supply chain integration is consistent with research (e.g., Zhang et al., 2003; Gunasekaran et al., 2004), which shows that IT systems enable faster decision-making and enhance the visibility and coordination of supply chain activities.

Inventory Management (B = 0.262, Beta = 0.219):

Interpretation: A one-unit increase in Inventory Management results in a 0.262 increase in Upstream Supply Chain Integration.

The Beta coefficient of 0.219 suggests that Inventory Management has a moderate impact on upstream supply chain integration. Efficient inventory management helps to synchronize the flow of goods and materials, reducing stockouts and overstock situations, which ultimately improves supply chain integration.

Empirical Comparison: Similar research has shown that effective inventory management is crucial for improving supply chain performance (e.g., Cachon & Fisher, 2000; Lee et al., 1997). Proper inventory control ensures smoother supply chain operations and better alignment with demand.

The regression analysis indicates that all the independent variables (Information Integration, Coordination, Organizational Relation, IT Tool Implementation, and Inventory Management) have a positive and statistically significant impact on Upstream Supply Chain Integration.

Among these, Inventory Management has the strongest unstandardized coefficient, followed by Information Integration, Coordination, and IT Tool Implementation.

These findings are consistent with existing empirical research, supporting the notion that key practices in supply chain management—such as information sharing, coordination, organizational relationships, IT implementation, and inventory control—play crucial roles in improving the integration of upstream supply chain activities.

Based on the findings from the regression analysis, ANOVA, and interpretation of the coefficients, we can summarize the hypotheses and their outcomes as follows:

4.9. Hypotheses Summary

Table 14: Hypothesis and Summary Table

Hypothesis	Variable(s) Tested	Result (Based on Regression & ANOVA)
H1: Information Integration positively affects Upstream Supply Chain Integration.	Information Integration	**Supported**: The unstandardized coefficient for Information Integration (0.226) is positive and statistically significant (p-value = 0.000). It has a positive impact on DSCI.
H2: Coordination positively affects Upstream Supply Chain Integration.	Coordination and Resource Sharing	**Supported**: The unstandardized coefficient for Coordination (0.196) is positive and statistically significant (p-value = 0.000), indicating a positive effect on DSCI.
H3: Organizational Relations positively affect Upstream Supply Chain Integration.	Organizational Relation	**Supported**: The unstandardized coefficient for Organizational Relation (0.161) is positive and statistically significant (p-value = 0.001), suggesting a positive effect on DSCI.
H4: IT Tool Implementation positively affects Upstream Supply Chain Integration.	IT Tool Implementation	**Supported**: The unstandardized coefficient for IT Tool Implementation (0.189) is positive and statistically significant (p-value = 0.002), indicating a positive impact on DSCI.
H5: Inventory Management positively affects Upstream Supply Chain Integration.	Inventory Management	**Supported**: The unstandardized coefficient for Inventory Management (0.262) is positive and statistically significant (p-value = 0.003), suggesting a positive eff

CHAPTER FIVE

Summary, conclusions and recommendations

In this chapter the summary of main findings has been summarized, conclusion and recommendation drawn for the study.

5.1. Summary of the findings

The summary of the findings in this study presented as follow

This study aimed to investigate the relationship between key upstream supply chain practices and Upstream Supply Chain Integration (DSCI), focusing on five independent variables: Information Integration, Coordination and Resource Sharing, Organizational Relation, IT Tool Implementation, and Inventory Management. A series of regression analyses and an ANOVA test were conducted to evaluate the impact of these variables on DSCI. The variables with higher mean values, such as Coordination and Resource Sharing (4.01) and IT Tool Implementation (3.68), indicate that these practices are relatively more perceived as effective in improving supply chain integration.

Conversely, Inventory Management (2.25) and Information Integration (2.53) have the lowest mean values, which could point to opportunities for improvement in these areas to enhance overall upstream supply chain integration.

Upstream Supply Chain Integration itself has a moderate score (2.71), suggesting that while integration exists, it may not be fully optimized, and further efforts are needed to improve it.

The ANOVA results indicated that the overall regression model was statistically significant, with a p-value of 0.000, which confirms that the independent variables collectively explained a significant amount of variation in the dependent variable (DSCI). The F-statistic of 21.320 further supported the overall strength of the model.

The regression analysis revealed that all five independent variables had a positive and statistically significant effect on Upstream Supply Chain Integration. Specifically:

Information Integration showed a positive impact (B = 0.226), with a standardized Beta of 0.244.

Coordination had a positive effect (B = 0.196), with a Beta of 0.266.

Organizational Relation was positively associated with DSCI (B = 0.161), with a Beta of 0.224.

IT Tool Implementation positively impacted DSCI (B = 0.189), with a Beta of 0.241.

Inventory Management had the highest impact (B = 0.262), with a Beta of 0.219.

All five factors were significant at the $p < 0.05$ level, meaning that increasing any of these practices leads to an improvement in Upstream Supply Chain Integration.

5.2. Conclusions

In this study the major variables have been measured to assess the upstream supply chain integration of Abat and mehari agro processing plc based on responses from members of the Abat and mehari agro processing plc products upstream supply chain partners. The research questions have been addressed based on sample analysis and the mean value and standard deviation along with their level of correlation.

The findings from this study highlight the importance of specific supply chain practices in improving Upstream Supply Chain Integration. All the independent variables examined—Information Integration, Coordination and Resource Sharing, Organizational Relations, IT Tool Implementation, and Inventory Management—were found to have a statistically significant and positive effect on supply chain integration.

Information Integration and Coordination are key drivers, as they improve the flow of information and collaboration across supply chain partners, which is essential for effective integration.

Organizational Relations and the implementation of IT Tools help to streamline operations and foster trust and communication within the supply chain, further enhancing integration.

Inventory Management emerged as the most impactful predictor, suggesting that efficient management of inventory systems plays a critical role in ensuring the smooth operation and integration of upstream supply chain activities.

The results also underscore the importance of focusing on these practices to optimize supply chain integration and enhance overall performance. The study suggests that organizations seeking to improve supply chain integration should prioritize improving these areas and foster stronger collaboration, better information sharing, and more efficient inventory management systems.

5.3. Recommendations

Based on the findings of this study, the following supply chain strategies recommended to strengthen the upstream supply chain integration

- Invest in IT infrastructure: Ensure that all relevant supply chain partners have access to and are using common platforms for sharing real-time data (e.g., cloud-based systems, Enterprise Resource Planning (ERP) software).
- Enhance communication protocols: Standardize communication methods and ensure that information flows seamlessly between departments and external partners.
- Training: Provide regular training for staff on the importance of information sharing and on how to use integrated systems effectively.
- Foster deeper collaboration: Encourage regular strategic meetings and workshops with supply chain partners to align goals and share resources, improving the overall synergy.
- Develop joint resource planning: Engage in joint planning and forecasting with suppliers and distributors to ensure mutual resource availability and avoid disruptions.
- Incentivize collaboration: Offer incentives for suppliers and partners who actively participate in shared initiatives or collaborative efforts that contribute to overall supply chain goals.
- Optimize existing IT tools: Evaluate the current IT tools in use for gaps and inefficiencies. Invest in software that improves visibility, tracking, and automation across the supply chain.
- Integration of advanced technologies: Explore technologies such as Artificial Intelligence (AI), Internet of Things (IoT), and blockchain for better tracking and transparency in the supply chain.
- Regular updates and training: Ensure that IT systems are regularly updated to keep up with technological advancement
- Implement better inventory forecasting: Use advanced predictive analytics and demand forecasting techniques to optimize inventory levels and reduce stockouts or overstocking.
- Adopt Just-in-Time (JIT) and Lean Inventory: Streamline inventory management practices by adopting JIT or lean inventory systems to reduce waste and improve supply chain responsiveness.
- Invest in automated inventory systems: Invest in automated systems such as barcode scanning and RFID to improve inventory accuracy, reduce manual errors, and enable real-time tracking.
- Integrate end-to-end processes: Work on integrating upstream and upstream processes more effectively. Collaborate with suppliers and distributors to create a seamless flow of information, goods, and services across the entire supply chain.
- Monitor and measure integration: Establish clear performance metrics to regularly assess the level of integration. Focus on KPIs such as lead time, order accuracy, and supply chain visibility.

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Appendix

DEBRE MARKOS UNIVERSITY

COLLEGE OF BUSSINES AND ECONOMICS

DEPARTMENT OF MANAGEMENT

Dear Respondents,**TESFAYE AYCHLUHIM**

I am conducting a research study on "ASSESSEMENT OF UP STREAM SUPPLY CHAIN INTEGRATION PRACTICE (CASE OF ABAT&MEHARI AGIRO PROCESING FLOUR FACTORY. In partial fulfillment of Master of in Business Administration at Debre Markos University .I request your help to spend some minutes of your time by filing the provided questionnaire. Your response will be confidential and will only be used for academic purpose. To obtain reliable and valid information for the researcher, your open and genuine response is highly appreciate please, answer all the questions without skipping, since in complete response are not valid

Thank you in advance for your cooperation!

If you need contact me by:

Phone: +251 948148496

Section I: General Backgrounds of Respondents (Demographic Information)

Instructions: - put tick (√) in the appropriate box in the space provided for the answers.

1. Please indicate your gender Male ☐ Female ☐
2. Please indicate your age group (in years):

below 25 ☐ 26 – 30 ☐ 31 – 35 ☐ 36– 40 ☐

41and above ☐

3. Please indicate your highest education qualification level

Illiterate ☐ Primary Education ☐ Secondary Education ☐ Diploma ☐

Bachelor Degree ☐ Master Degree and Above ☐

4. Your years of service in the company

<1 years ☐ 1 - 3 years ☐ 4 - 7 years ☐ >7 years ☐

5. Your Area of operations

Finance ☐ strategy and operation ☐ Human resource ☐

Marketing ☐ production ☐ other ☐

Your marital status. Single ☐ Married ☐ Divorced ☐

The following questions are about how your organization has been implementing upstream supply chain integration Practice, Benefits and IT utilization. Please indicate the level of your agreement or disagreement using (□) on the following statements based on your experience in your company on the following supply chain management practices. The rating is 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5=Strongly Agree as shown below.

S.N	Description	1	2	3	4	5
	SECTION 3: level and practice of upstream supply chain practices					
	Information Integration					
1	You are frequently sharing Information with partners for decision making improvement					
2	You are using Information technology to access information by all partners					
3	Information is available to all partners for Collaborative Planning in the upstream supply chain					
4	There is real-time information practice directly from the end customer for demand forecast to avoid disruption					
	Coordination and Resource Sharing					
5	Every partner of the upstream supply chain members involves in Decision making process					
6	Every member of partner realizes joint action to achieve common objective					
7	Partners in the upstream supply chain involves in designing and development of packaging to facilitate handling in transport, reduce cost and ensure quality					
8	There is agreement on delivery frequency throughout the supply chain					
9	There is Common use of logistical equipment practice among members in the upstream supply chain					
	Organizational Relationship Linkage					
10	There is active communication channel with members of the supply chain					
11	Common performance indicators have been established that aligned with agreed common objective					
12	Integrated behaviour has been established to promote integrated business performance					
13	Joint Objectives have been established among supply chain members					

14	There is practice of Sharing of skill, Ideas and institutional culture along the upstream supply chain					
15	Stable links with partners of the supply chain have been established					
16	The supply chain encourage team building for coordination and cooperation					
	***Views regarding* inventory management**					
17	The company has a good warehousing system about SCIM.					
18	I am aware inventory management available services on SCIM					
19	I am aware inventory management available services on SCIM					
20	There is a good inventory management system in the company.					
	SECTION 5: IT TOOLS IMPLIMENATION					
21	Your Company Employed advanced Information systems for sharing information with partners					
22	Your company Implemented Electronic Data Interchange (EDI) system					
23	Your company implemented forecast or demand management system					
24	Your company's information system is linked with BGI Information system to share information					
25	There is a strong collaboration with Abat and mehari in implementation of Information Communication Technology tools					
	Benefits and performance of upstream supply chain integration					
26	The collaboration of partners throughout the upstream supply chain increase sales volume					
27	Created market competitiveness					
28	Your profit increased due to supply chain integration					
29	You have been helped to decrease the total logistics cost					
30	Builds high sustainable customers' satisfaction on the product and service quality					
31	Developed high level of responsiveness whenever necessary					

THANK YOU