DOWNSTREAM SUPPLY CHAIN INTEGRATION IN BREWERY INDUSTRY: THE CASE OF BGI ETHIOPIA'S PRODUCT

BY

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DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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Statement of certification

This is to certify that **Mulugeta Zenebe Asfaw** has carried out his research work on the topic entitled, **"Downstream supply chain integration in brewery industry: the case of BGI Ethiopia's product"** is his original work and is suitable for submission for the award of Master of Art Degree in Logistics and Supply Chain Management

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Declaration

I the undersigned, declare that the thesis entitled "**Downstream supply chain integration in brewery industry: the case of BGI Ethiopia's product"** is my original work and has not been presented for any other University for any other requirements, and that all sources of materials used for the thesis have been duly acknowledged.

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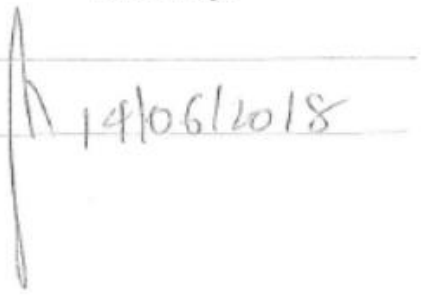
Signature: 

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List of abbreviations and acronyms

BGI	Brasseries Et Glaciers Internationals
BPR	Business Process Reengineering
CRM	Customer Relationship Management
CRS	Coordination and Resource Sharing
DSCI	Downstream Supply Chain Integration
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
HL	Hector Liter
ICT	Information Communication Technology
II	Information Integration
IT	Information Technology
NT	Network Theory
ORL	Organizational Relationship Linkage
PAT	Principal Agent Theory
PLM	Product Lifecycle Management
RBV	Resource Based View
RFID	Radio Frequency Identification
SC	Supply Chain
SCI	Supply Chain Integration
SCM	Supply Chain Management
SPSS	Statistical Package for Social Science
TCA	Transactional Cost Analysis
TQM	Total Quality Management

Abstract

Downstream Supply chain integration is part of supply chain integration; coordinating and synchronizing the functions and interdependent organizations to address product and services to end consumer to enhance common benefits. The main objective of the study is to assess downstream supply chain integration in Brewery industry in Ethiopia in the case of BGI Ethiopia products. The level and practice of information integration, coordination and resource sharing, organizational relationship linkage, perceived benefits of downstream supply chain integration and information technology tools implementation practice has been analyzed. The main drivers of this study are those Critical factors of the downstream supply chain integration including; Poor information integration and traditional way of communication and lack of trust among partners. The study deployed descriptive research method with representative sample of 304 respondents from the downstream supply chain partners selected through stratified random sampling. A self-developed questionnaire adopted from related literatures as well as semi structured interview and focus group discussion was used as a research tool for collecting data. The collected data was analyzed using statistical package for social science version.23 software descriptive statistics (mean, standard deviation and correlation). The main findings of the study show that, the level and practice of information integration, coordination and resource sharing, organizational relationship linkage and information technology tools implementation practice rated at low level. However, the perceived benefits for downstream supply chain partners rated at satisfactory level. Poor collaboration, lack of trust, low level of information technology utilization, high cost and lack of focus for supply chin integration are the main challenges or barriers identified in this study. Finally, the study recommends proper Information integration, establishing active communication channel, establishing common performance indicators, efficient resource sharing, and capacity building to strengthen the integration and maximize the benefits of partners.

***Keywords**: Information, Integration, Coordination,*

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CHAPTER ONE

Introduction

This introduction part of the study will discuss the background information of downstream 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.

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 downstream to customers (Stevens, 1989).

On the other side, as John Mangan & Chandra (2012) illustrate on their book, Global logistics and supply chain management, there are four primary model of supply chain integration including; Back ward integration; Integration with first tyre and second tyre supplier, forward Integration; Increasingly with first tyre customers or service providers, Forward & back ward

integration; Integration with suppliers and customers and Internal integration; Cross functional integration within an organization.

Upstream and downstream 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 downstream supply chain to win the market for the reason that , this research focused on analysing practice, level, benefits and challenges of downstream supply chain integration for BGI Ethiopia'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.

BGI Ethiopia plc. is one of the Breweries in Ethiopia with about 3.5M HL attainable capacity producing four brands of products (Castel, St. George, Amber and Panache beer) both in draft and bottle (BGI, 2018).

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 downstream 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 downstream 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 downstream supply chain integration, there is no Information Technology implemented in the downstream 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 downstream supply chain the company made price and non-price decision making process by itself without participating major partners in the downstream supply chain. This implies the existence of lack of trust among the members in the downstream 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 downstream supply chain integration in brewery industry among the supply chain partners , how members of the downstream supply chain members perceived the benefits of integration among them and the challenges observed for integration in the downstream supply chain.

1.3. Research questions

The research was guided by the following main research questions

- What is the level and practice of downstream supply chain information integration?
- What is the level and practice of collaboration & resource sharing in downstream supply chain information integration?
- What is the level and practice of organizational relation linkage between downstream partners of BGI Ethiopia products?

- What are the perceived benefits of downstream supply chain integration in BGI Ethiopia?
- What is the level of ICT practice to facilitate & mange the downstream supply chain integration in the BGI Ethiopia?
- What are the challenges of downstream supply integration in BGI Ethiopia plc.?

1.4. Objective of the study

1.4.1. General objective of the study

The general objective of the study was to assess downstream supply chain integration in brewery industry.

1.4.2. Specific objectives of the study

The specific objectives of the study are:

- To analyse the level and practice of information integration,
- To analyse the level and practice of collaboration & resource sharing,
- To analyse the level and practice of organizational relation linkage in the case brewery companies' downstream partners?
- To investigate the perceived benefits of downstream supply chain integration in brewery industry.
- To assess the level of ICT utilization and information flows in brewery industry
- To identify the challenges of downstream supply chain integration in brewery industry

1.5. Significance of the study

Analysing the downstream supply chain management integration supposed to have significant importance for brewery industry specifically for BGI Ethiopia and its supply chain partners; moreover; to academicians, operation managers, and policy makers, generally for business practitioners.

The study brought some concepts on downstream supply chain integration in brewery industry. Likewise, the study helps breweries as additional input for their improvement plan. The research findings will also give insights to supply chain partners (distributors, retail outlets, transporters, etc.) in the chain of the case breweries industry to analyse their own supply chain operational performance excellence.

Furthermore, this research outputs expected to a basis for other researchers to fill gap and address problems that has been identified by this study.

1.6. Scope of the research

This study was delimited on the downstream supply chain integration on brewery industry especially on BGI Ethiopia Products. The study also delimited geographically in Addis Ababa and surrounding towns. The Conceptual scope of this study was limited to the supply chain variables including information integration among the downstream partners, coordination and resource sharing practice and collaboration on BGI Products downstream supply chain partners, information technology utilization practice, benefits, challenges of downstream supply chain integration in brewery industry.

1.7. Organization of the research report

This research is organized into five chapters: Chapter one contains 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 discusses related literature review on downstream 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.

1.8. 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 downstream 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).

Downstream

The movement away from suppliers and towards customers. Conversely, upstream is the movement towards the suppliers (Sadler, 2007).

CHAPTER TWO

Related literature review

2.1. Introduction

In this chapter, different relevant literatures have been reviewed related to downstream 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 downstream supply chain integration practice, challenges and benefits to partners in the downstream supply chain.

2.2. Theoretical Literature review

2.2.1. 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 downstream 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.

Downstream 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.

2.2.2. 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 downstream 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 downstream 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.

2.2.3. 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).

2.2.4. 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.

2.2.5. 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).

2.2.6. 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.

2.3. Empirical Literature review

2.3.1. 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.

2.3.2. Benefits of supply chain

Kittipong Tissayakorn (2013) describes the flow of information to upstream from customer to supplier while the flow of material downstream 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 downstream.

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 downstream partners may cause the imbalance of supply and demand across the chain (Tan, *et al*., 1998).

2.3.3. 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.

2.3.4. 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).

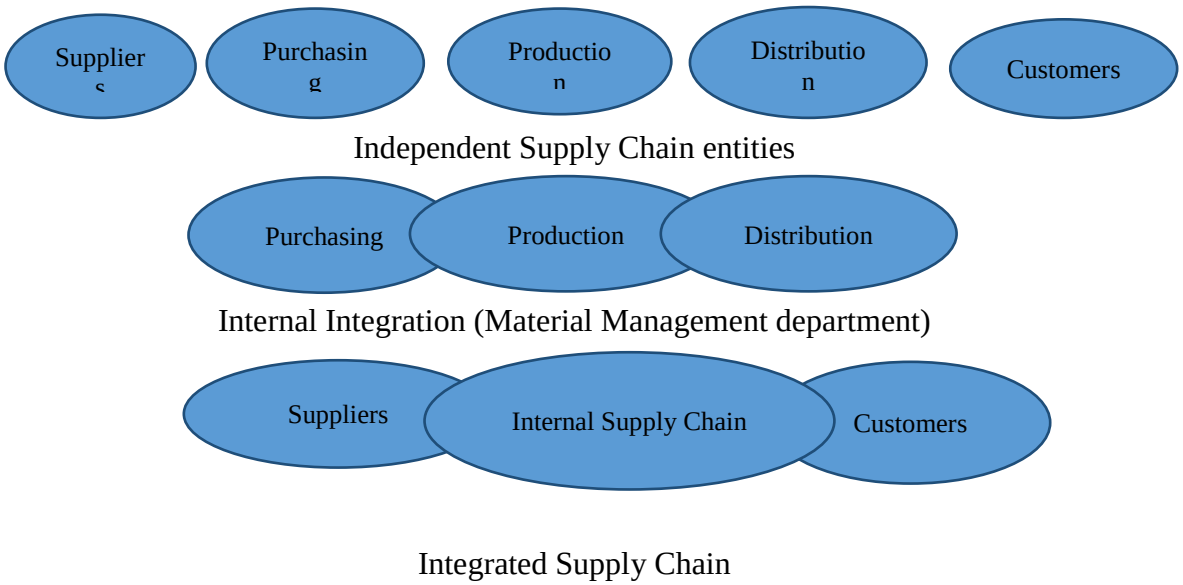


Figure 2.3-1 Level of Supply Chain Integration

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 downstream 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.

2.3.5. 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 downstream) 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 downstream 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).

2.3.6. 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).

2.3.7. External integration (upstream and downstream)

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 downstream 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 downstream supply chain integration as; downstream 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 downstream 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 downstream 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).

2.3.8. 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).

2.3.8.1. 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).

2.3.8.2. 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).

2.3.8.3. 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).

2.3.9. 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).

2.3.10. Role of ICT for supply chain integration

One of the basic tools for efficient downstream 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 importance 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.

2.3.11. BGI Ethiopia Downstream supply chain

BGI plc is a member of Castel Group which its head office is based in France, established in 1997 in Kombolcha. BGI Ethiopia was the first private Owen brewery in Ethiopia by acquiring 47 Hectar of land. Initially BGI started manufacturing and distributed to Ethiopian Market two brands (Bati and Castel beer). During that period the main competitor in the market was St. George Beer. In 1998 BGI Ethiopia plc Owned St. George beer factory and then expand its capacity by installing the third factory at Hawassa city mainly for south and east part of Ethiopian market (BGI, 2018).

Currently BGI Ethiopia plc has three brand products of two types each. These are St. George, Castel and Amber beer in bottle and draft. BGI Has three factories located in Kombolcha, Addis Ababa and Hawassa with total production Capacity 3.5M HL.

2.3.11.1. Facility Location

The three factories of BGI Are located strategically near to the customers. Kombolcha Factory is based in Kombolcha to address the Central, North and North west part of Ethiopia while Addis Ababa St. George factory mainly focused Addis Ababa and its neighbouring regions as the main market area is Addis Ababa. Hawassa factory is located in Hawassa to cover the south and eastern part of Ethiopia (BGI, 2018).

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 downstream 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 downstream 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 downstream supply chain integration level, benefits, coordination among stakeholders, challenges or barriers of supply chain integration in BGI Ethiopia products has been assessed and analysed.

DOWNSTREAM SUPPLY CHAIN INTEGARTION (DSCI)

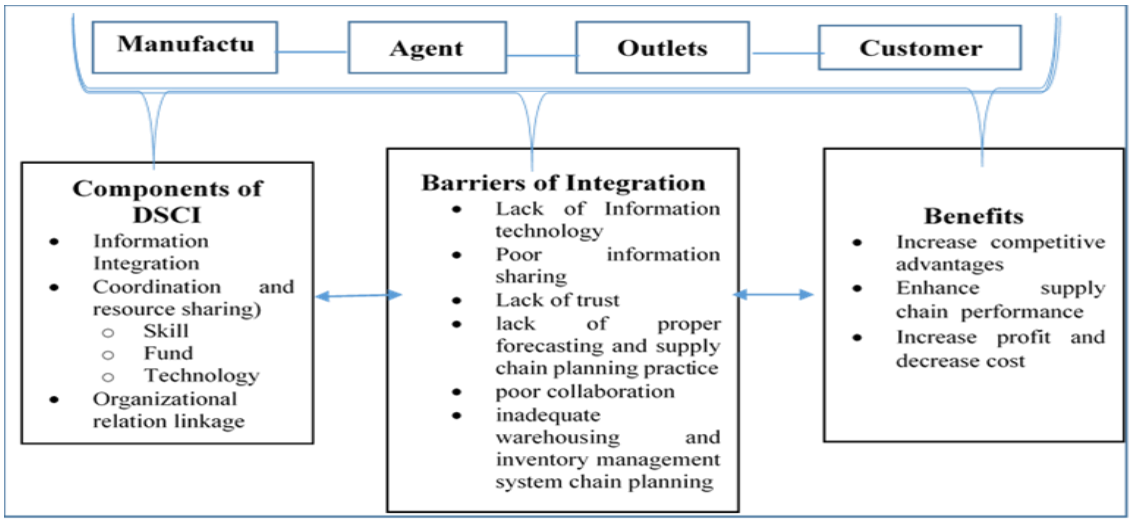


Figure 2.4-1 Conceptual Framework

Source: Self depicted based on network theory

Note: Arrows in the diagram show, the existence of barriers during the downstream integration to benefits partners.

2.5. Identified literature gap

There are several studies that have been conducted to analyses the impact of supply chain integration on supply chain performance. Those studies mainly focused on upstream part of the supply chain. However, literatures on the downstream supply chain part is limited or studied with the overall supply chain part. But, this study focused on analysing the practice and level of downstream supply chain integration based on the primary data or observation which was collected from representative sample from manufacturer, agents, or wholesalers and outlets within BGI Ethiopia products' downstream supply chain.

CHAPTER THREE

Methodology of the study

3.1. Introduction

The major purpose of the study is to identify and explore the practice and level of downstream supply chain integration in brewery industry.

This part of the study presents research methodology. It contains data source, sample and sampling techniques, data gathering tools, methods of data analyses and ethical consideration.

3.2. Research design

The study is descriptive type which showed the level of integration, challenges faced in downstream supply chain, the benefits gained by the business firms in the brewery supply chain, the level of coordination and the tools implemented on the existing supply chain integration practice. As the research intention was to show the extent of the facts in the downstream supply chain integration and needs to investigate what is happening on the downstream supply chain based on the facts observed, descriptive type of research design implemented (Kotheri, 2004). Thus, the research was an empirical case analysis that tried to investigate a current phenomenon of downstream supply chain management integration in the brewery industry of the country.

3.3. Population size and sampling techniques

3.3.1. Target population and size

The study covered BGI products supply chain partners including the manufacturer, agents and retailers or outlets (Both exclusive outlets and nonexclusive) in Addis Ababa and surrounding towns. In this supply chain, there are 6 agents, 148 exclusive outlets, 8893 nonexclusive outlets, in Addis Ababa and surrounding towns.

Table 3.3.1Number of agents and outlets in Addis Ababa and surrounding towns

S.N	Territory	Number of Agents	Number of Outlets		
			Exclusive	Nonexclusive	Total
1	T1	1	**38**	1,835	1,873
2	T2	1	**20**	1,066	1,086
3	T3	1	**22**	1,212	1,234
4	T4	1	**23**	1,520	1,543
5	T5	1	**37**	2,404	2,441
6	T6	1	8	856	864
TOTAL		**6**	**148**	**8,893**	**9,041**

Source: BGI Ethiopia Sales department

3.3.2. Sample size

For the collection of information, stratified random sampling method applied to reach the final respondents. First segmented the population into territories or regions as strata. Then from each territory or stratum, outlets selected by using simple random sampling to reach the outlets. This helped to reach and cover all territories so as to represent the population

Therefore, as per Robert V. Krejcie *et. al* (1970), the sample size based on 95% confidence interval and 5% error margin presented as follow

Table 3.3.2 Sample size

S.N	Territory	BGI	Number of Agents	Number of Outlets		
				Exclusive	Nonexclusive	Total
1	T1	3	1	2	74	76
2	T2	3	1	1	43	44
3	T3	3	1	1	49	50
4	T4	3	1	1	62	63
5	T5	3	1	2	97	99
6	T6	3	1	1	36	37
		18	6	8	361	369

From the company side, respondents selected based on purposive sampling in the sales and marketing department Managers, Coordinators and sales promoters from each territory.

3.4. Sources of data and data collection instrument

The study used both primary and secondary type of data. Primary data was collected through questioners, interviews as well as Focus group discussion with selected management staffs of the company. Secondary data collected from company published document and literatures, books and other publications.

As this methodology requires detail information to come up with the result, questions prepared to collect primary data from willing BGI Products downstream supply chain participants. The collected data summarized and analyzed and finally interpretation had be made from the drawn samples (Leady P.D, 2010).

3.5. Data analysis

In this study, both qualitative and quantitative data analysis are applied. The quantitative data analysis has been done using descriptive statistics to compute the central tendency, frequency, standard deviation and correlation using a statistical tool known as SPSS V 23. The findings of each variable presented using figures, percentages, tables, charts and graphs. The qualitative data collected from BGI Ethiopia, Agents and outlets explained for further detail awareness about the findings of the quantitative data in each variable. The demographic background information of the respondent also presented using descriptive statistics.

3.6. Reliability test

Reliability measures to what extent data collection instrument addresses uniform result throughout repeated trials while validity measures the consistency of the information in which the instrument yields (Leady P.D, 2010).

Chronbach Alpha Statistics is the most important tool preferred to the reliability and internal consistency of the findings. Chronbach Alpha result has to be above 0.70 to obtain a reliable scale and any scale with Chronbach Alpha which is less than 0.70has to be excluded (Sekaran & Bougie, 2013).

Accordingly, Table 3.6.1 shows that, the Chronbach alpha statistics based on 30 pilot surveys made found is above 0.7.

Table 3.6.1Reliability Test Statistics

Variable	Cronbach's Alpha	Number of Items
Information Integration	.768	4
Coordination and resource sharing	.713	5
Organizational relationship linkage	.880	7
Downstream supply chain integration Benefits	.860	6
IT tools Implementation	.811	5

Source: Own survey result, 2018

3.7. Validity test

Validity is categorized into internal and external validity; where internal validity refers to the level to which its design and the data it yields allows to come up intended and accurate conclusions about cause-and-effect relationship within the data while external validity refers to the level to which the research results apply to situations beyond the research.

The draft research question had been reviewed by different individuals who have expertise knowledge and practitioners directly involved in the BGI Ethiopia products' downstream supply chain. The research framework also constructed by reviewing different related published literatures.

For this research, the respondents selected from the top management of BGI Ethiopia plc. Coordinators and facilitators of agents, wholesales, outlets. Accordingly, reliable response were reacted for the research question stated at the beginning of the study

In this study, the respondents were clearly communicated on the contents of the questioner as well as the objectives of the research. That is suitable techniques implemented so as to sustain the validity and reliability of the data. Avoiding leading questions, taking notes not just depending on

tape recorders conducting a pilot interview; and giving the interviewee a chance to sum up and clarify the points they have made.

3.8. Ethical consideration

Respondent were informed about the objective and purpose of the study and verbal consult was obtained for better participation engaged in the study.

Participants were also informed their right not to participate in the study at any time. Participants were clearly informed the benefit of the research and thus research has no risk. Participants have been given right to ask question or clarification and refuse to give information in any time in the research process if there is any.

CHAPTER FOUR

Results discussion and interpretation

4.1. Introduction

This chapter presents the analysis and interpretation of results; data were collected through questionnaire from BGI Ethiopia, Agents and out lets both exclusive & non-exclusive outlets which operate in the downstream supply chain of BGI Ethiopia products'.

The data analysed using Statistical Package for Social Science (SPSS v.23). Based on the methodologies, research design and tools of the proposal the data was collected from 317 respondents. From the total 396 questionnaires distributed 317 were returned from which 13 were not correctly filled and rejected. Therefore 304 were effectively used for analysis that shows response rate of 77%. According to Smith (2002) the return or success rate 50% is 'adequate'; 60% response rate is 'good' and 70% rate or higher is 'very good'.

Accordingly, Demographic data and frequency of respondents, analysis, interpretation and discussion on the results are presented in the subsequent headlines.

4.2. Demographic data presentation and analysis

Observing the demographic trend or characteristics of our sample population before starting the data analysis is useful to make the analysis more meaningful for the reader. This part of the questionnaire requested limited amount of information related to personal and demographic status of respondents.

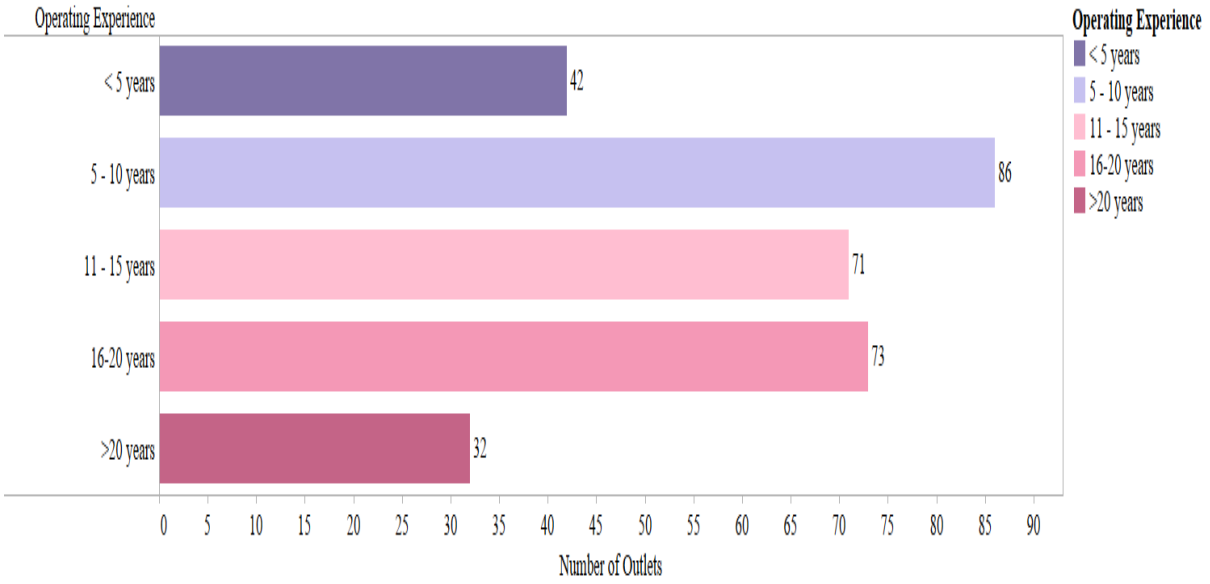
The purpose of demographic analysis in this research is to describe the characteristics of the sample such as proportion of male and female in the sample, managerial position of respondents, academic qualification of respondents and experience of respondents. Accordingly, these variables are summarized and described in tables shown below.

Table 4.2.1Demographic profile of respondents

Variable		Frequency	Percent	Cumulative Percent
Number of Employee	<100	269	88.5	88.5
	101-250	20	6.6	95.1
	250-500	15	4.9	100.0
	Total	304	100.0	
Operating Experience	<5	42	13.8	13.8
	5-10	86	28.3	42.1
	11-15	71	23.4	65.5
	16-20	73	24.0	89.5
	>20	32	10.5	100.0
	Total	304	100.0	
Gender	Male	250	82.2	82.2
	Female	54	17.8	100.0
	Total	304	100.0	
Qualification	MA or Above	10	3.3	3.3
	BA/BSC	103	33.9	37.2
	Diploma	78	25.7	62.8
	High School and Less	113	37.2	100.0
	Total	304	100.0	
Job Position	Top Management	126	41.4	41.4
	Middle Management	151	49.7	91.1
	Officer	27	8.9	100.0
	Total	304	100.0	
Work Experience	<5	65	21.4	21.4
	5-10	87	28.6	50.0
	10-15	73	24.0	74.0
	>15	79	26.0	100.0
	Total	304	100.0	

Source: Own survey result, 2018

Figure 4.2-1 Operating Experience



As the above graph presents the operating experience of the downstream supply chain partners of BGI Ethiopia products, more than 42% of the respondents have 10 years and less experience and 58% have more than 11 year experience on the market. The information of the business firms' experience shows us they have good understanding on the practice and level of the downstream supply chain management among the partners.

Figure 4.2-2 Number of Employee

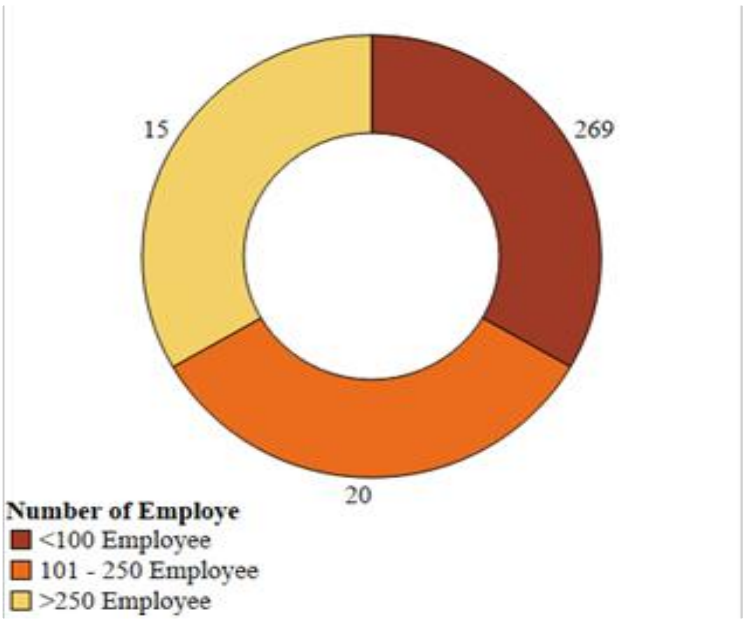
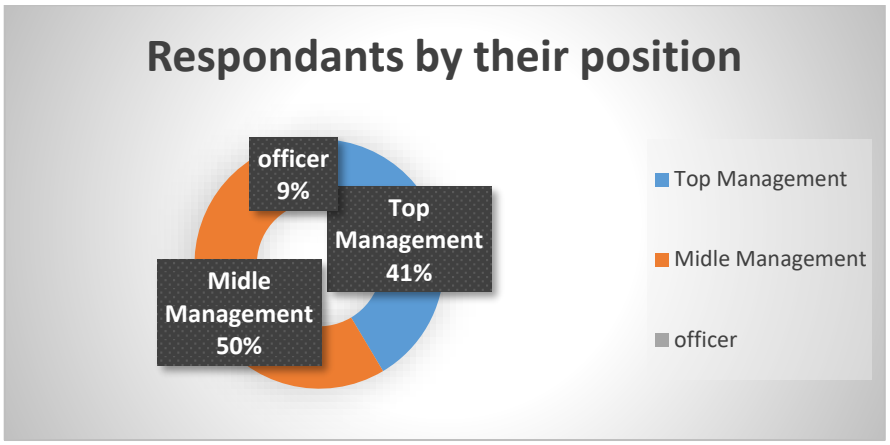
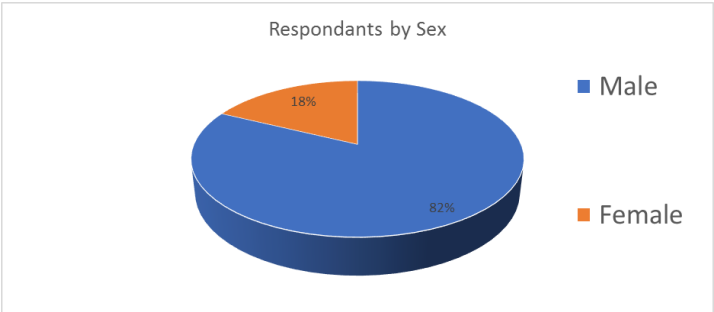


Figure 4.2-3. Job Position



The Above Donut chart presents the number of employee managed in the business firms. From the total respondents, 88% of the respondents have less than 100 employees and 7% of them have up to 500 employees and the remaining 5% have more than 500 employees working in the organizations. On the other side 41% of the respondents are top management or owners of the business organizations while 50% of the respondents are middle level and the remaining 9% are lower level management members of the business firms. This result shows the respondents can understand and respond the questioners very carefully.

Figure 4.2-4 Gender



On the other side as the above pie chart shows that, 82% of the respondents are male and the remaining 18 % are female which indicates the majority of beer business managed by males.

Regarding the educational level of the respondents, 37% are high school or less and 63 % are diploma or above. The educational level help to easily communicate with the respondents to get the required information. The working experience of the respondent was the other main issue raised to respondents. The result showed that, 50 % of the respondents have less than 10 year work experience, 50 % of them have more than 10 years experiences.

In general, the demographic data from the above tables showed that, the respondents are capable of responding the questioner and can give valuable inputs to the research to come to the end result.

4.3. Descriptive analysis

The main statistics to measure the central tendency of that shows the general image of the situation is mean or average of the observations. The mean value of observation in each dimensions of

downstream supply chain integration suggests that the average amount that each dimension has positive or negative response of respondents. In this case, the mean of each item together with their respective dimension overall mean was found to show the level and practice of downstream supply chain integration of BGI Ethiopia products.

The mean statistical values of the items were based on the 5 point Likert scale and demonstrated through the following assumptions: if the mean (M) score is below 2.5 it implies that the respondents disagree with the respective statement, if the mean score is equal to 2.5 it indicates that the respondents prefer satisfactory, and if the mean score is above 2.5 it implies that the respondents agree with the respective statement.

Regarding the standard deviation, it measures the distribution of the score from the mean. given the distribution of the scores is symmetrical and if we divide the distribution into standard deviation from the mid-point, 99% of the score lie between 3 stranded deviation. In this research result considered valid if the standard deviation is below 3 and will be rejected if the standard deviation is above 3. (Brock, n.d.)

Accordingly, the mean scores and standard deviations have been computed for all the five-downstream supply chain integration variables that include; Information Integration, Coordination and resource sharing, organizational relationship linkage, perceived benefits of downstream supply chain integration and practice of IT tools implementation.

Table 4.3.1 Level and practice of BGI Ethiopia products downstream supply chain integration

	N	Mean	Std. Deviation	Skewness	
Variables	Statistic	Statistic	Statistic	Statistic	Std. Error
Information Integration	304	2.23	.935	.937	.140
Coordination and Resource sharing	304	2.04	.833	.684	.140
Organizational relationship linkage	304	2.30	1.018	.678	.140
perceived benefits	304	2.50	1.165	.415	.140
Information Technology Implementation	304	1.41	.690	2.023	.140
Valid N (list wise)	304				

Source: Own Survey, 2018

Based on the respondents in the downstream supply chain partners, the practice and level of downstream supply chain integration has been presented in the above table 4.3.1. According to the result presented on the table 4.3.1, the level of information integration, coordination and resource sharing, organizational relationship linkage and IT tools utilization practice rated at low level. However, the respondents agreed that, they could get better benefits from the downstream supply chain integration. The detail analysis for each variable is presented as follow.

4.3.1. Information integration

Table 4.3.2 Information Integration

Items	Scale					Mean	Std. Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Information sharing practice	12.8	49.3	4.3	27.0	6.6	2.65	1.193
Usage of Information technology to access information by all partners	34.2	47.0	4.3	12.5	2.0	2.01	1.032
Accessibility of Information	25.3	53.3	7.9	10.9	2.6	2.12	.996
Access of Real time information from end customers	32.9	44.1	4.9	14.5	3.6	2.12	1.128
Information Integration Grand mean						2.23	.935

Source: Own survey result, 2018

The effect of information integration in the BGI Ethiopia's product downstream supply chain is reflected in various ways: lack of information technology to share information, access of information among all partners and getting real time information from the end user.

However, as Moharanan *et.al* (2012) emphasized the importance of information for supply chain integration as the main fastener of business firms process, structure and activities among the partners for their sustainability (Moharana, *et al*., 2012). In addition, the success of the supply chain also enhanced when the supply chain integration supported by information integration (Frohlich & Westbrook, 2001). In the current dynamic market, one of the most significant input to develop the competitive advantage is capability of accessing information due time. In this situation Fasika *et.al* (2014) research also shows the information integration level in manufacturing industry in developing countries rated at low level and mainly supported by traditional way of information communication like letter, telephone and fax and verbal instructions (Fasika, *et al*., 2014) .

Information integration is one of the most significant dimensions of downstream supply chain integration. The above table 4.3.2 pinpoints the mean value of each item related to information integration with its aggregate average.

From the table 4.3.2 below, there is the practice of information sharing among the downstream supply chain partners (M=2.65, SD= 1.2). However, the practice of using information technology is at low level (M=2.01, SD=1.03). As the result the accessibility of information to all partners as well as obtaining real time information from the end consumers are stayed at low level (M=2.2, SD=0.996) and (M=2.12,SD 1.13) respectively.

As per table 4.3.2, the respondents are under complain of information integration due to the absence of information technology to freely sharing of accurate information in the downstream supply chain and timely sharing of information with members of supply chain with a mean and standard deviation score of (M=2.23, SD=0.935).

As Rafaeli & Ravid (2003) research indicted, information sharing among the supply chain partners is highly dependent on the use of information technology and the existence of information system that supported the real time information access from the end consumer (Rafaeli & Ravid, 2003). Likewise, the Pearson correlation analysis stated in the table below (Table 4.3.3) shows there is high level of correlation between the practice of using information technology to access of information among them as well as from the end consumer r=0.676 and r=0.639 respectively.

Table 4.3.3 Pearson Correlation of Information Technology with access of information

Variables		Usage of Information technology to access information by all partners	Accessibility of Information	Access of Real time information from end customers
Usage of Information technology to access information by all partners	Pearson Correlation	1	.676**	.639**
	Sig (2-tailed)		.000	.000
	N	304	304	304
Accessibility of Information	Pearson Correlation	.676**	1	.783**
	Sig (2-tailed)	.000		.000
	N	304	304	304
Access of Real time information from end customers	Pearson Correlation	.639**	.783**	1
	Sig (2-tailed)	.000	.000	
	N	304	304	304

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

Source : Own Survey, 2018

As per focused group discussion held with BGI sales and marketing department responsible staffs, the company is investing huge amount of money to implement ERP system to enhance the information system within the company. The system which is installed and implemented to enhance the internal integration of the three factories (Hawassa, Kombocha and Addis Ababa) by sharing real time information which covers all functional departments like procurement, inventory, sales and human resource which mainly focused the financial management aspect of the company. However, this virtual wide area network didn't synchronize the downstream supply chain partners to access and share information. On the other side, BGI is accessing information from the market through sales staffs which didn't cover the whole market at real time base.

4.3.2. Coordination and resource sharing

Table 4.3.4 Coordination and Resource sharing

Item	Scale						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Participation of partners in decision making process	61.2	29.6	4.6	3.0	1.6	1.54	.847
Realization of Joint action towards common goal	33.9	39.5	10.5	13.8	2.3	2.11	1.093
Involvement of partners on design and development of packaging	64.1	26.3	3.6	5.6	.3	1.52	.836
Agreement on delivery frequency	27.6	37.5	8.6	22.0	4.3	2.38	1.221
There is Common use of logistical equipment practice	24.0	32.9	6.6	29.3	7.2	2.63	1.319
Coordination and Resource sharing Grand mean						2.04	.833

Source: Own Survey, 2018

Coordination within the supply chain is the most important activity to manage the material, information as well as fund flows throughout the supply chain members (Arshinder, *et al*., 2008).Coordination and resource sharing is one of the most significant dimensions for successful supply chain integration which look up synergy based on trust and interdependency among the supply chain partners (Rafaela, *et al.*, 2012).

The coordination and resource sharing practice in BGI Ethiopia products downstream supply chain rated at low level. As per the table below, coordination and resource sharing practice has been measured by five items including; partners' participation on decision making, realization of joint objectives, involvement on designing and development of packaging, Agreement on delivery frequency as well as common use of logistics equipment among the partners.

In this regard, as it indicated on table 4.3.4, practically there is common usage of logistical equipment practice among the supply chain members rated (M=2.63, SD, 1.32). From the discussion with sales managers of BGI Ethiopia, the company provides equipment and accessories for draft beer sales as well as promotional equipment for all exclusive outlets.

On the other side, table 4.3.4 shows that, practice of participating on decision making process is rated at low level (M=1.54,SD=0.847). Decision making process involves sharing of price and non-price information among the stakeholders. In this situation the result indicated on table

4.3.4 that there is lack of trust among BGI and agents to share important information for decision making. From focus group discussion, the main reason to not participate main agents for decision making especially on price setting is lack of trust which the partners may focus for their individual interest rather than focusing group interest. As Matopoulos *et al.,* 2007 description, trust is one of the significant influential items to build collaboration among partners for decision in the supply chain. They also highlighted the influential power of trust to create strong relationship by developing intercompany dependencies between business firms (Matopoulos, *et al*., 2007).

The other basic item to measure the level of coordination and resource sharing variable is how partners realize the joint action towards their common goal. In this regard, as per table 4.3.4 realization of joint action towards common goal is rated (M=2.11,SD=1.09).

Rafaela *et al*.,(2012) sugest that, the level of Cooperation among the supply chain partners determined by the practice how members realize the joint action for their common goal (Rafaela, *et al*., 2012). However, as indicated on table 4.3.4, in BGI products downstream supply chain partners, the level of cooperation is at lower rate. This implies most of the partners in the downstream supply chain strive by their own way to maximize individuals as sales volume as well their profit.

As Rafaela *et al (*2012) conceptual framework, the level of coordination and resource sharing also characterized by how partners involved in designing and development of packaging to facilitate handling and tranportation as well as to reduce logistics cost. In this situation the level of participation of partners in designing and development process is rated as lower level (M=1.52,SD=0.836).

The other basic component to measure coordination and resource sharing is how partners in the downstream supply chain agree on product delivery frequency. Joint agreement on delivery frequency determines the production cycle length and for joint economic procurment, production and delivery policy (Arshinder, *et al*., 2008). Hence, the level of agreement on delivery frequency rated at low level (M=2.38, SD=1.221). This indicates the product delivery to the final outlet is determined by the distribution agent and the availablity of the product from the factory.

In general, table 4.3.4 indicates that the level of coordination and resource sharing in BGI downstream supply chain rated at low level (M=2.04,SD=0.833). In many outlets, BGI products especially St. George draft is selling to the end consumer with other competitors' glass cups which has significant impact on the visibility of the product and ultimately affect the future performance

4.3.3. Organizational relationship linkage

Table 4.3.5 Organizational Relationship Linkage

Variables	Scale					Mean	Std. Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Presence of active communication channel	16.8	49.7	10.2	17.4	5.9	2.46	1.14
Establishment of Common performance indicators	34.5	36.8	8.9	15.5	3.9	2.17	1.18
Establishment of Integrated behaviour	34.9	37.2	9.5	16.1	2.3	2.14	1.13
Establishment of Joint Objectives	36.5	34.2	8.6	17.8	3.0	2.16	1.19
Practice of Sharing of skill, Ideas and institutional culture	25.7	38.2	10.5	22.7	3.0	2.39	1.18
establishment of Stable links with partners	25.3	35.2	10.2	24.7	4.6	2.48	1.24
Encourage team building for coordination and cooperation	29.6	35.9	10.2	21.7	2.6	2.32	1.19
Organizational relationship linkage Grand mean						2.30	1.02

Source: Own Survey, 2018

The level of downstream supply chain Integration characterized by the level of inter-organization relationship linkage among different business firms in the supply chain. Inter-organizational relationship determined by the existence of dependency one on another for the importance of shared goals and benefits as well as creating collaborative rules and practice (Nicholls & Huybrechts, 2014). On the other side, Rafaela *et al (*2012) also highlight the importance of clear strategic vision in the organizational relationship linkage to achive common vision, objectives, share risk an reduce costs and to define their common perfomance.

From the respondants in the downstream supply chain of BGI products, the level of organizational relationship linkage presented in the above table(Table 4.3.5).

The first and the most important element on inter organizational relationship linkage is the creation of active communication channel among business firms along the chain. In this situation table 4.3.5 shows that, the respondents didn't agree for the presence of active communication channel in the BGI products downstream supply chain (M=2.46, SD= 1.137). Hence the presence of active communication channel rated as low level. On the other side, from semi structured interview with sales manager in BGI Ethiopia, the company established clear organizational

structure to reach the ultimate customer (sales manager- sales coordinator- sales supervisor- sales promoter) in every sales region or territory. This chain is designed to develop high level of information flow as well as to reach the customer to promote the sales activity as well as to give support to the outlet whenever needed. However, more than 76% of the respondent didn't agree for the presence of active communication channel so that the information communication is not sufficient and not at regular base.

The research result also shows that, 71% of respondents didn't agree on the establishment of common performance indicators along the supply chain partners while 20% of the respondents agree for the presence of common performance indicators. The remaining 9% respondents needed to stay neutral. This result indicates the supply chain partners do not agree on the existence of unbiased performance measurement from one outlet to the other (M=2.17, SD=1.178).

Regarding the establishment of integrated behaviour along the downstream supply chain partners, 72% of the respondents do not agree on the statement while 18% of the partners believed on the existence of integrated behaviour among the partners. 10% of the respondent responded neutral on the statement. As the result showed in Table 4.3.3 the level of establishment of integrated behaviour within the downs stream supply chain partner is rated low (M=2.14, SD=1.132)

The practice of developing joint objective in the downstream supply chain was measured as; 71% of the respondents do not agree on the statement while 20% of the respondents agree on the establishment of objective jointly with partners and the remaining 9% respondent responded as neutral. The practice of establishment a joint objectives is rated as low (M=2.16, SD=1.185). According to the semi structured interview with the sales manager, there is the practice of joint meeting with agents and main customers to establish objectives and sales target at yearly base.

The next basic item used to measure the level organizational relationship linkage is how skill, ideas, and institutional culture being shared among the supply chain partners. In this situation 64% of the respondents do not agree for the practice of sharing skill, ideas and cultures while 26% believed on it. The remaining 10% of the respondents stayed neutral to react on the statement. In this regard, the practice and level of knowledge sharing among the partners in the downstream supply chain rated at lower level (M=2.39, SD=1.178).

As per the qualitative information got from sales and marketing department of BGI Ethiopia, there is practice of giving technical training for agents and outlets in different time. In addition, the company's door is also open to customers to visit the production process to build knowledge on the company's product. But they also believed that the practice of sharing knowledge and ideas is not at optimal level and needs improvement. Regarding institutional culture, the company is doing different promotional events to share the culture of the company to agents and outlets. It also observed that, the institutional culture among BGI and some exclusive outlets is at good start.

Organizational relationship linkage also described in terms of the existence of long term contract or relationship among partners. In this regard, 61% of the respondents do not agree as they have stable linkage among them while 29% agree on the existence of stable linkage with partners and 10% remains neutral. On the other side the qualitative information got from semi structured interview with the sales and marketing manager, the company is doing with agents for more than 15 years at contract of yearly renewal base. It shows the existence of long term relationship with agents or distributers. On the contrary from Table 4.3.5 describes the level of establishment of stable link with partners in the downstream supply chain needs improvement (M=2.48, SD=1.237)

The last but not the least parameter to measure the level of organizational relationship linkage considered is, how the supply chain encourage team work or doing together for their common goal. Accordingly, 66% do not agree on the practice of team work while 29% agree on it. The level of encouraging team work in BGI Ethiopia products downstream supply chain rated at low (M=2.32, SD=1.186).

In general the practice and level of organizational relationship linkage is rated at low level (M=2.30, SD=1.018) and needs improvement.

Table 4.3.6 Pearson Correlation on organizational relationship linkage measuring parameters.

		Presence of active communication channel	Establishment of Common performance indicators	Establishment of Integrated behaviour	Establishment of Joint Objectives	Practice of Sharing of skill, Ideas and institutional culture	establishment of Stable links with partners	Encourage team building for coordination and cooperation
Presence of active communication channel	Pearson Correlation	1	.860**	.738**	.796**	.604**	.617**	.613**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	304	303	304	304	304	304	304
Establishment of Common performance indicators	Pearson Correlation	.860**	1	.797**	.841**	.592**	.610**	.621**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	303	303	303	303	303	303	303
Establishment of Integrated behaviour	Pearson Correlation	.738**	.797**	1	.844**	.704**	.678**	.702**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	304	303	304	304	304	304	304
Establishment of Joint Objectives	Pearson Correlation	.796**	.841**	.844**	1	.677**	.702**	.712**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	304	303	304	304	304	304	304
Practice of Sharing of skill, Ideas and institutional culture	Pearson Correlation	.604**	.592**	.704**	.677**	1	.826**	.688**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	304	303	304	304	304	304	304
establishment of Stable links with partners	Pearson Correlation	.617**	.610**	.678**	.702**	.826**	1	.716**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
	N	304	303	304	304	304	304	304
Encourage team building for coordination and cooperation	Pearson Correlation	.613**	.621**	.702**	.712**	.688**	.716**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	304	303	304	304	304	304	304

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

Source: Own Survey, 2018

Regarding the correlation among each item to measure the organizational relationship linkage Table 4.3.6, there is strong positive relation among them. As per the correlation table, the presence of active communication channel have strong correlation with for establishment of common performance indicators along the chain, to establish integrated organizational behaviour, to establish joint objectives, for sharing skill & knowledge among members of the chain, to establish sustainable relationship as well as to encourage team building (r= .86, .738, .796, .604, .617 and .613) respectively.

4.3.4. Benefits of downstream supply chain integration

Table 4.3.7 Perceived Benefits of Downstream Supply Chain Integration

Item	Scale					Mean	Std. Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
increase sales volume	21.4	36.2	9.2	26.3	6.9	2.61	1.269
Created market competitiveness	21.4	36.5	9.9	25.3	6.9	2.60	1.263
Increased profit	25.7	36.8	13.5	20.1	3.9	2.40	1.181
Helped to decrease the total logistics cost	31.9	35.5	10.9	16.4	5.3	2.28	1.220
sustainability of customers' satisfaction on the product and service quality	26.3	32.2	10.9	21.1	9.5	2.55	1.331
Developed high level of responsiveness	25.7	31.6	11.5	24.3	6.9	2.55	1.291
perceived benefits Grand mean						2.50	1.165

Source: Own Survey, 2018

The perceived benefits of the downstream supply chain integration in BGI Ethiopia downstream supply chain integration was measured in terms of five highly correlated items. These are to what extent the partners in the chain have been helped to increase sales volume, to create market competitiveness, to increase profit, to decrease costs, to create sustainable customer satisfaction on product and service and to develop high level of responsiveness.

The perceived benefits of BGI Ethiopia products downstream supply chain integration is presented in the above table 4.3.7.

From the responses it was clear that the following are the benefits that the partners of BGI Downstream supply chain partners enjoyed due to downstream integration of supply chain: The sales volume of business firms increased; they created market competitiveness, sustainable customer satisfaction being created on the product and service quality and high level of responsiveness has been developed. However, the respondents do not agree for increment of profit and the downstream supply chain integration didn't contribute for cost reduction.

One of the significant importance of downstream supply chain integration is increasing sales volume. In this regard, the respondents agreed on the sales volume have been increased (M=2.61, SD=1.269). On the other side, 33% of the respondents believed that the sales volume increment came due to practice of integration while 36% of the respondents do not agree that the sales volume increment is due to downstream supply chain integration.

Regarding creation of market competitiveness, the respondents agreed on the integration would create market competitiveness (M=2.6, SD=1.263). While58% of the respondents didn't agree that the market competitiveness was not created due to integration, 32% believed that the market competitiveness created due to integration and the remaining 10% respondents remains neutral.

Even though the sales volume can contribute for increasing the business profit, 63% of the respondents do not agree on the profit increased due to integration on the contrary only 24% of the respondents believed that the integration brought increasing business profit. As the result BGI Ethiopia product downstream supply chain integration couldn't enhance partners profit (M=2.4, SD=1.181)

Coordination, collaboration, common use of logistical equipment or high level of integration among partners in the supply chain will bring the total logistics cost low. However, from the Table 4.3.4 shows that the downs stream supply chain integration contribution to lowering partners' cost rated as insignificant (M=2.28, SD=1.22). In other words, 67% of the respondent didn't agree on the downstream supply chain integration helped them to decrease the cost while 21% agreed on the statement.

On the other side, from focus group discussion made with selected sales and marketing staffs of BGI Ethiopia, the company is supporting agents and exclusive outlets intensively in different ways; which may help these segments of the downstream supply chain to lowering the total cost. The main objective of the company to support these partners of the company is to build model houses which promote BGI Ethiopia's products and build loyal customers. However, such material and promotional support given by the company couldn't cover the entire outlets which BGI products sell. These customers respond to the cost reduction differently. As the result, the practice and level of being helped to reduce total logistical cost is rated at low level.

The other most important benefits expected from downstream supply chain integration is building sustainable customer satisfaction on the product and service quality. In this regard, from Table 4.3.4 in BGI Ethiopia products downstream supply chain integration, building sustainable customer satisfaction is rated above satisfactory rate (M=2.55, SD= 1.331). Even though 58% of the respondent didn't agree on the statement 32% agreed that sustainable customer satisfaction was built due to integration. The quality of product and service provided to the ultimate customer, affordable price, availability of suitable product, goodwill of the company are the main factors which could affect the development of sustainable customer satisfaction as the result the sales volume and market competitiveness will be enhanced as well. Table 4.3.8 presents the sustainability of customer satisfaction on the product and service quality would help to increase sales volume and to create market competitiveness r=0.903, r=0.88 respectively

Table 4.3.8 Pearson Correlation on Suitability of customers' satisfaction

Variables		sustainability of customers' satisfaction on the product and service quality	increase sales volume	Created market competitiveness
sustainability of customers' satisfaction on the product and service quality	Pearson Correlation	1	.903**	.880**
	Sig (2-tailed)		.000	.000
	N	304	304	304
increase sales volume	Pearson Correlation	.903**	1	.947**
	Sig (2-tailed)	.000		.000
	N	304	304	304
Created market competitiveness	Pearson Correlation	.880**	.947**	1
	Sig (2-tailed)	.000	.000	
	N	304	304	304

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

Source: Own Survey, 2018

The other significant characteristics to assess the benefits of downstream supply chain integration is measuring how downstream supply chain partners developed responsiveness. In this regard from Table 4.3.4 the downstream supply chain developed high level of responsiveness to the market demand (M=2.55, SD=1.291). On the other side, 57% of the respondents did not perceive high level of responsiveness while 32% believed that they developed high level of responsiveness in the chain.

Development of high level of responsiveness would help the supply chain partners for sustainable customer satisfaction as the result help to increase sales volume and to create market competitiveness.

Table 4.3.9 Pearson Correlation on development of high level of responsiveness

Variables		Developed high level of responsiveness	sustainability of customers' satisfaction on the product and service quality
Developed high level of responsiveness	Pearson Correlation	1	.841**
	Sig (2-tailed)		.000
	N	304	304
sustainability of customers' satisfaction on the product and service quality	Pearson Correlation	.841**	1
	Sig (2-tailed)	.000	
	N	304	304

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

Source: Own Survey, 2018

In general, table 4.3.7 shows us, the perceived benefits of the downstream supply chain integration in BGI Ethiopia downstream supply chain is rated satisfactory (M=2.5, SD=1.165)

The correlation analysis indicated in the below table 4.3.10 shows the perceived benefits in the downstream supply chain strongly correlated each other. The increase in sales volume and organizational profit will be highly affected by competitiveness in the market, total logistics cost, by level of customer satisfaction as well as the extent of developing responsiveness to the change in demand.

Table 4.3.10 Pearson Correlation on benefits of downstream supply chain integration.

		increase sales volume	Created market competitiveness	Increased profit	Helped to decrease the total logistics cost	sustainability of customers' satisfaction on the product and service quality	Developed high level of responsiveness
increase sales volume	Pearson Correlation	1	.947**	.905**	.762**	.903**	.808**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	304	304	304	304	304	304
Created market competitiveness	Pearson Correlation	.947**	1	.908**	.743**	.880**	.800**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	304	304	304	304	304	304
Increased profit	Pearson Correlation	.905**	.908**	1	.739**	.856**	.775**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	304	304	304	304	304	304
Helped to decrease the total logistics cost	Pearson Correlation	.762**	.743**	.739**	1	.792**	.739**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	304	304	304	304	304	304
sustainability of customers' satisfaction on the product and service quality	Pearson Correlation	.903**	.880**	.856**	.792**	1	.841**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	304	304	304	304	304	304
Developed high level of responsiveness	Pearson Correlation	.808**	.800**	.775**	.739**	.841**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	304	304	304	304	304	304

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

Source: Own Survey, 2018

4.3.5. It tools implementation

Table 4.3.11 Frequency of respondents on IT tools Implementation

Item	Level					Mean	Std. Deviation	N
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
Advanced Information systems for sharing information with partners	73.36	17.43	2.30	4.28	2.63	1.45	.932	304
Implementation of Electronic Data Interchange (EDI) system	64.47	23.36	1.64	10.20	0.33	1.59	.964	304
Implementation forecast or demand management system	72.70	15.46	2.30	8.55	0.99	1.50	.965	304
Linkage of Information system with BGI	81.25	15.79	0.66	1.32	0.99	1.25	.632	304
Collaboration with BGI Ethiopia in implementation of ICT tools	82.89	13.49	0.66	1.64	1.32	1.25	.677	304
IT tools Implementation Grand Mean						1.41	0.69	304

Source: Own Survey, 2018

Prior to 1980, information sharing among partners in the chain as well as among functional departments within the business firm was made mostly paper based (Prashant & Venkitaswamy, 2009). As information is one of the most significant components in the supply chain integration, efficient information flow along the chain has significant impact for effective supply chain management.

Implementation of information technology has significant benefits to the organization as well as for the chain for information integration; like cost reduction, reliability of information, due time information sharing, easy to coordinate information (Durugbo, *et al*., 2014). Thus, Information technology implementation is the next important variable measured to assess the practice and level of BGI Ethiopia products downstream supply chain integration.

The level and practice of IT implementation in BGI Ethiopia downstream supply chain integration was measured through five basic parameters including; deployment of advanced information systems for sharing information among partners, implementation of Electronic data interchange (EDI) systems, implementation of forecast and demand management system, linkage of information system with BGI Ethiopia information system, as well as collaboration with BGI Ethiopia for in implementation of IT tools.

As indicated on table 4.3.11 the practice of using advanced information system for sharing information for decision making process is evaluated extremely low (M=1.45, SD=0.932). Table 4.3.11 shows more than 90% of the respondent didn't use advanced information system for information sharing while only 7% believed that there is practice of using advanced information

system for information sharing. From semi structured interview made with BGI Ethiopia sales manager, there is practice of information sharing among functional departments and sales promoters based on high level Microsoft software (ERP) installed in the company. However, there is no advanced information system which has been integrated in the downstream supply chain partners.

The implementation of data interchange system (EDI) and forecast and demand management system also rated very low (M=1.59, SD=0.964) and (M=1.5, SD=0.965) respectively. Similarly, the majority of the respondents didn't agree on the practice of using EDI and forecast and demand management system.

The linkage of the information system as well as collaboration with BGI Ethiopia in implementation of ICT tools rated significantly low (M=1.25, SD=0.632) and (M=1.25, SD=0.677) respectively.

In general, the practice and level of IT tools implementation in BGI Ethiopia downstream supply chain is rated low.

4.3.6. Challenges for downstream supply chain integration

Supply chain integration is characterized by the need of shifting from traditional fragmented way of doing business to more synchronized way of value creation so as to minimize cost and maximize benefits of each partner in the chain (Sweeney, 2009). The need of shifting from fragmented to integrated relationship among partners requires change management.

The challenges or barriers of downstream supply chain integration was studied through semi structure interview with BGI Ethiopia sales and marketing department and supply chain department managers separately.

Poor Collaboration: The sales and marketing staffs visits the final outlets mainly to assess the sales performance and if there are technical problems on their sales equipment like refrigerator, draft cooling machine and accessories. Apart from this issue, the linkage of the company as well as distribution agent with the outlet is rated at low level. Each sales promoter in every territory expected to reach to all outlets every fifteen days. However, practically the sales promoter is not covering the outlets within intended due time. This loose coordination among the downstream supply chain partners is one of the significant challenges on the downstream supply chain integration.

Lack of trust: In supply chain trust is the basic milestone for effective integration. However, the company does not trust agents for real time sharing specially price decision making process. Ideally, the company should consult the main agents as partner before making any price decision.

However, as the agents may affect the market due to mismanagement of inventory, the company is making decision by its own and let agents know for implementation of the new price in the market.

The demand is higher than supply: Currently in Ethiopia the demand of both bottle and draft beer is increasing while the capacity and number of breweries are radically evolving for the last few years. However, BGI Ethiopia is producing and selling its products with maximum capacity and holding the largest market share. Having such high market share, let the company focus only traditional way of doing the marketing and sales aspect rather than strengthen the supply chain integration.

High investment cost: the downstream supply chain integration has to characterize on level of resource sharing. However, due to high number of outlets in the country, the company is only focusing on exclusive outlets and some influential market areas to share resources to enhance the relationship with final outlets. In this aspect significant number of outlets St. George beer draft is selling with competitors branded glass cups. As the result the visibility of the company's product will be affected due to the company couldn't address enough material either affordable price or freely. This is also considered by members of the chain as partiality.

Low usage of Information Communication Technology: Information integration is one of the key indicator of the level and practice of supply chain integration. In this regard, as the practice of using information technology is low, the level of information integration rated at low level. Therefore, practice of not using information technology with in the chain was one of the main challenges observed.

Lack of skilled staff and professional knowledge: for the implementation of high-tech information system requires high level of skilled staff and professional knowledge. In this situation most of the outlets and agents with in the chain has limited or no professional skill. Thus, lack of skilled staff in the chain affected the integration process.

Lack of Knowledge: All the partners should understand the benefits of integration among partners in the chain. However, there is clear lack of knowledge throughout the chain which the integration can bring from cost reduction up to creation of market competitiveness

Bottlenecks in BGI Ethiopia downstream supply chain.

The main actors of BGI Ethiopia products downstream supply chain who have parts in value addition are the company, the agents and outlets (exclusive and nonexclusive). The product distribution map is shown in the below diagram.

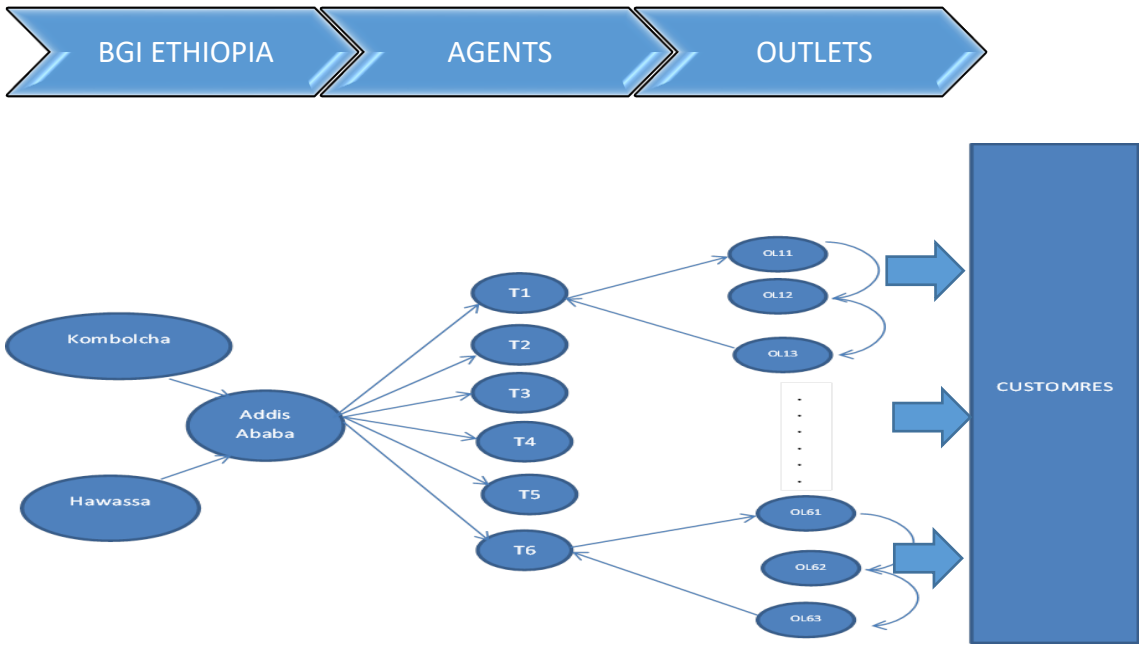


Figure 4.3-1 BGI Ethiopia products distribution map in Addis Ababa

The above map shows that, in Addis Ababa and surrounding towns, BGI Ethiopia products addressed to ultimate customers through 6 territories and more than 9000 exclusive and nonexclusive outlets. As per the information gained through focus group discussion with sales and logistics managers, BGI distribution strategy is based on the nature of the products, customer behavior, the strategy of the competitors, geographical location of the distributors, retailor or outlets.

As per the discussion, the distribution channel or network is the main strategic area which needs to address the main objectives of the company and for the success of the company. The nature of the product and customer behaviour are the other most significant factor for distribution channel. As per discussion with sales and logistics mangers, most of the customers are not loyal and needs agility and availability of the product at the time they need. Otherwise, the consumers easily shift to other competitor's product which directly affects the future sales.

The Major challenge observed on the distribution channel is the timely of delivery of the product. As per the focus group discussion; in some territories products may not be delivered at required place and time. In such case outlets are forced to buy products with additional cost or effort from other nearby territory or from agents' store. Such distribution problem occurs mostly due to

location and responsiveness problem. The location of the outlet is coming the major challenge as it is remote from the distribution center which the sales truck may reach there at late hours. This affects the overall performance of the distribution channel. The road jamming is also a cause for late delivery of the goods to the final outlet.

To maximize the distribution efficiency of BGI Ethiopia products, the following major action should be taken place by the company.

a) Based on the area coverage and the distance covered to address the products to all outlets in the territory, some other potential agents should be included as sub agent or as agent. So, some parts of the sales area will be managed by these new potential subagents or agents.

b) The second but not the least option is setting one or more additional warehouses near to the remote market. In this situation the agent needs to locate the products and trucks near to the market and the required finished goods should be moved to these warehouses which can store enough product for the region and the trucks should start distribution from this point of origin so as to cover minimum distance to reach the outlets. The main cost here is fixed cost for warehouse rent. But the efficiency of the route will increase. Therefore, based on this option, the following distribution model is recommended.

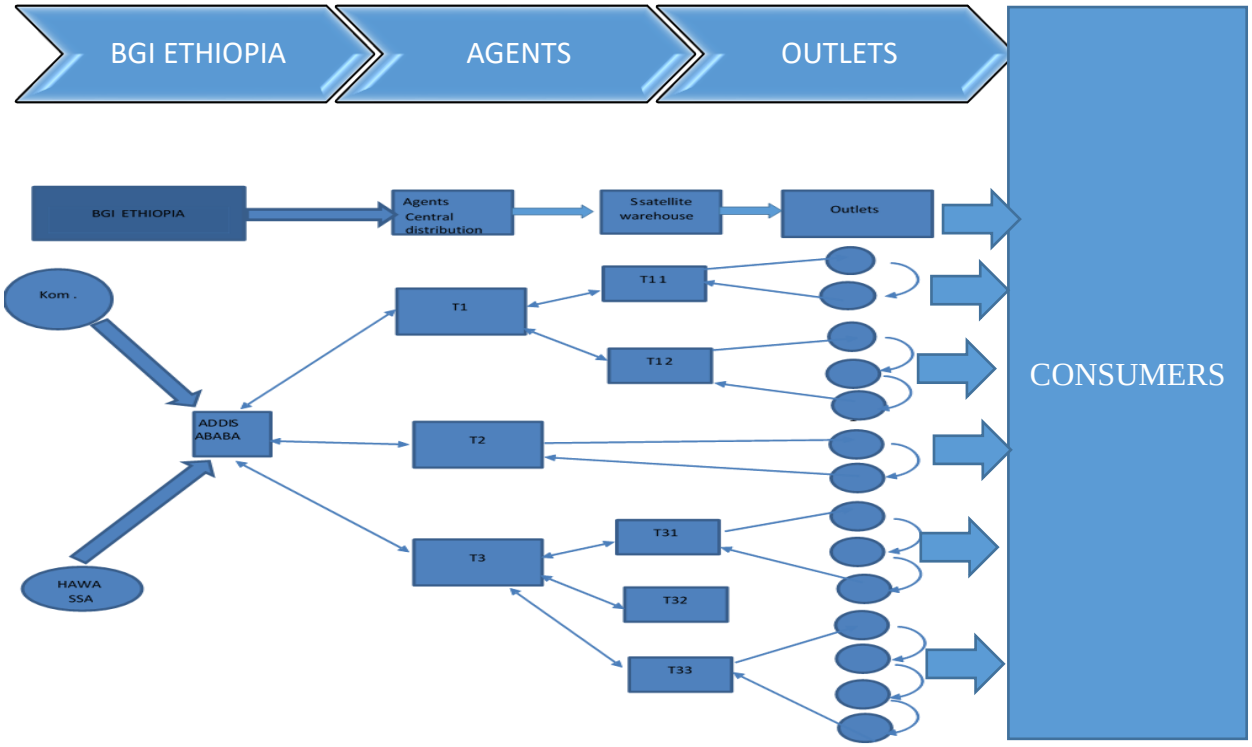


Figure 4.3-2 Recommended BGI Ethiopia products distribution Network model

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

The level and practice of downstream supply chain information integration, collaboration and resource sharing, and organizational relation linkage between downstream supply chain partners of BGI Ethiopia products rated at low level (M=2.23,SD=0.935), (M=2.04, SD=0.833) and (M=2.304, SD=1.018) respectively.

As the correlation coefficient between usage of information technology against accessibility of information and access of real time information from end consumers (r=0.676 and 0.639) respectively indicates, the effect of not using information technology on practice and level of information integration is significant.

On the other side, partners of the downstream supply chain perceived the benefits they would get by having integrated chain in terms of increasing sales volume, reducing cost and creating market competitiveness as the result to enhance the organizational profit. The mean value of the perceived benefits of the downstream supply chain integration rated at M=2.5 and standard deviation SD=1.165.

The other most significant finding of the study was practice of implementing IT tools to synchronize the information integration along the downstream supply chain. In this regard, he practices of implementing and using IT tools is rated at very low (M=1.41 SD=0.690) which indicates the practice of IT tools implementation is at infant stage.

Finally, the main challenges or barriers which affect the downstream supply chain integration are poor collaboration, lack of trust among partners, the demand is higher than supply which the breweries can sell what they produce which leads to low focus for supply chain integration, high investment cost, low level of usage of high-tech information technology, lack of skilled staff and professional knowledge.

5.2. Conclusions

In this study the major variables have been measured to assess the downstream supply chain integration of Brewery industry based on responses from members of the BGI Ethiopia products downstream 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 level and practice of information integration, coordination and resource sharing as well as organizational relation linkage found at low level rated below 2.5. The values indicate the level of downstream supply chain integration is at infant stage and needs improvement to cope up the dynamic growth of the market situation and for sustainable development of the chain.

On the other side, even though the level of integration is at low stage, the members of the downstream supply chain in brewery industry recognize the benefits they would get from integration M=2.5. However, the result shows there is a need of improvement in all dimensions to strengthen the downstream supply chain integration.

Since the practice of using IT tools in supply chain has significant impact on information integration as well as for synchronized information flow from manufacturer to consumer and vice versa, the usage of IT tools is the other basic dimension of the study. In this regard, the practice of cope up the dynamic growth of information technology to access real time information observed as at low level M=1.41 SD=0.69.

Poor collaboration and lack of trust among partners in the downstream supply chain of the brewery industry are the main barriers to enhance the integration of the supply chain. In addition, lack of focus for integrating business firms in the downs stream is the other significant factor for low level integration. This is due to the brewery industry has no market problem in the country as the demand is higher than the supply of beer. Low level of information technology utilization has also impact for information integration. Apart from these, lack of skilled staff and professional knowledge is the other significant barrier for integration in the downstream supply chain of brewery industry.

5.3. Recommendations

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

- **Usage of Information Technology**; Information integration is highly integrated with information technology. To cope up the dynamics of the current market competition, information has to be accessible with all critical partners of the downstream supply chain members. In addition, real time information from end consumers and outlets has to be accessed by the manufacturing company as well as distribution agents for their effective product distribution. Now a day the very simple way to access and share information in most companies is, using a four-digit text mobile message. The company has to at least implement the four-digit Text Message strategy to get real time information at any corner of the market instead of calling directly to personal cell phone. The text message will be addressed to the main server of the company to access responsible person of the company and can manage the issue. Providing a good logistics system supported by advanced information technology would play an important role in ensuring products are received by the final outlets and consequently reached the end-consumers. So, for Long term strategy, the company has to design IT project and integrate its IT infrastructure to downstream supply chain partners for synchronized information and document flow in both directions.
- **Establishing Active Communication Channel**; This study shows that, the existence of active communication channel in the supply chain would have impact on the organizational relationship linkage especially for establishment of common performance indicators, to build integrated behaviour as well as to establish common objectives in the downstream supply chain. Therefore, the company should maintain and strengthen the channel which can synchronize the collaborative action throughout the chain.
- **Establish Common Performance Indicators;** Coordination and resource sharing could be effective and unbiased when there is common performance indictor along the supply chain. As resource is limited and needs huge amount of investment, the resource has to be distributed based on their performance. Thus, the company has to set up reliable performance indicators and all members of the chain have to agree on the targets, measurements tools and period of performance.
- **Resource Sharing;** the company has to provide logistics equipment like glass cups, refrigerator, umbrellas and tent freely or at affordable price as other competitors do. In addition the company also has to share promotional equipment with its partners to enhance the supply chain linkage on the bases of their strategic role and performance instead of inclining only for exclusive outlets.

- **Customer Relation Management**; BGI Ethiopia plc. needs to transform usual customer relationship with critical customers. This requires the identification and follows up of critical Customers; strategic and potential customers (agents and outlets) have to be invited to be involved demand and market forecasts and distribution strategy setting. There should also be customers' performance measurement schemes with which they are going to be motivated and rewarded or penalized. Together, they should develop a joint team that facilitate trust among partners, solve potential problems that may be created in the supply chain.
- **Capacity Building**; One of the significant finding in the challenges for downstream supply chain integration was lack of professional skill for the implementation of IT tools and developing synchronized supply chain network. Thus, the company should bring attention on the IT usage and develop skill on the importance and usage of IT tools throughout the chain to facilitate the information flow. In addition, the company needs to create training opportunity for strategic and critical customers as well as its staff on the emerging supply chain management practice. The knowhow of supply chain and its benefits has to be recognized by the top management members and staffs so as to establish effective coordination and information integration along the chain.
- **Enhance Distribution network**; the current distribution network lacks efficiency in some territories to timely arrival of the products to the required place of delivery. The main reason for such delay is the location of the distribution warehouse which is not near to the final outlets. In this case outlets are forced to buy products with additional effort or cost. To mitigate such problem in which for large covering territory, stores or warehouse should be created near to outlets so as to start the distribution from this point.

5.4. Limitation of the study

In conducting this research, the most and significant constraint were limited literatures available on downstream supply chain integration especially in Brewery industry of Ethiopian. The next most significant challenge was unavailability of secondary data that can be easily accessed for the purpose. The other significant challenge was the willingness of the respondent to fill the questioner due time and lack of supply chain concept at all level of the supply chain members. In this regard only 304 respondents' questioner have been considered for this study from the 393 questionnaires distributed. Some of the respondents also seemed sensitive about revealing confidential company information, which increased the difficulty of doing this research. The study also didn't comprehend the effect of the integration on the overall downstream supply chain performance. In addition, the study was conducted only one brewery case. So, further study should be conducted to show the effect and fill the gap of this study.

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APPENDIX

Appendix I

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የንግድ ሥራ ት/ቤት
ADDIS ABABA UNIVERSITY
College of Business and Economics (CoBE)
SCHOOL OF COMMERCE

Ref. No. AAU/SOC/LSCM/ /
Date:

To Whom It May Concern

Dear Madam /Sir,

The department of Logistics and Supply Chain Management of Addis Ababa University –School of Commerce would kindly request your esteemed organization to extend the required assistance to Mr./Mrs./ Muluqeta Zenebe a graduate Logistics and Supply Chain Management student who is currently working on a research entitled " Assessing downstream Supply chain intergretion in brewery Industry (In the case of BGI Ethiopia's product) for the partial fulfillment of Master of Arts degree in Logistics and Supply Chain Management.

The department would appreciate your all-rounded assistance that will be given to the student researcher regarding the provision of pertinent information to the thesis work indicated above. The department strongly beliefs in such a university-industry collaboration that will enable it to design, develop and enrich the curriculums to meet industry requirements & standards. This collaboration will play its own role in enhancing the research culture in the country. Thanking you profoundly, for investing your precious time to support the student researcher in order to complete his/her thesis work successfully within the given time target.

If you have doubts or questions you can access the coordinator via e-mail: zellalem@gmail.com

Sincerely Yours,

Zellalem Tadesse
Coordinator, Logistics and Supply Chain Management MA Program

Supply Chain Sales & Marketing Staff Corp
for your usual cooperation

Appendix II

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE GRADUATE STUDIES

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

QUESTIONNAIRE TO BE FILLED BY DOWNSTREAM SUPPLY CHAIN PARTNERS

Dear respondents:

The intent of this questionnaire is gathering data for a thesis to be conducted with regard to the **ASSESSING DOWNSTREAM SUPPLY CHAIN INTEGRATION IN BREWERY INDUSTRY: (THE CASE OF BGI ETHIOPIA'S PRODUCT)** for the partial fulfillment of the requirements for the Master of Logistics and Supply Chain Management Degree.

Your honest reply is highly appreciated and will contribute a lot to the accuracy of this research paper. The information collected from this questioner will only be used for academic purpose and will be treated with strict confidentiality.

Thank you for your time and consideration! Your kind participation is much appreciated.

Instruction: Please, put a tick (□) mark in which you want to select

SECTION-1: COMPANY PROFILE

The following questions are about demographic profile of your organization. Kindly indicate the appropriate characteristics of your organization using ().

1.1 The numbers of employees:

< 100 □ 101- 250 □

>500 □

1.2 Operating experience of this company in Ethiopia :

□ < 5 years □ 11 - 15 years

□ 5- 10 years □ 16 - 20 years> □ years

SECTION-2 RESPONDENT'S PROFILE

The following questions are about the respondents profile in the organization. Kindly indicate the appropriate characteristics of the respondent's profile using ().

2.1 Gender Male □ Female □

2.2 Respondent's current position in the company

Top Management □

Middle management □

Officer □

2.3 Respondent's qualification level: _____

MA or above □ DIPLOMA □

BA/BSC □ High school and less □

2.4 Field of study/Qualification

_____

2.3 Respondent's work experience

□ < 5 years □ 10-15 years

□ 5-10 years □ >15 years

The following questions are about how your organization has been implementing downstream 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 downstream supply chain information integration, collaboration & resource sharing and organizational relation linkage between downstream partners of BGI Ethiopia products					
II	**Information Integration**					
II1	You are frequently sharing Information with partners for decision making improvement					
II2	You are using Information technology to access information by all partners					
II3	Information is available to all partners for Collaborative Planning in the downstream supply chain					
II4	There is real-time information practice directly from the end customer for demand forecast to avoid disruption					
CRS	**Coordination and Resource Sharing**					
CRS1	Every partner of the downstream supply chain members involves in Decision making process					
CRS2	Every member of partner realizes joint action to achieve common objective					
CRS3	Partners in the downstream supply chain involves in designing and development of packaging to facilitate handling in transport, reduce cost and ensure quality					
CRS4	There is agreement on delivery frequency throughout the supply chain					
CRS5	There is Common use of logistical equipment practice among members in the downstream supply chain					
ORL	**Organizational Relationship Linkage**					
ORL1	There is active communication channel with members of the supply chain					
ORL2	Common performance indicators have been established that aligned with agreed common objective					
ORL3	Integrated behaviour has been established to promote integrated business performance					
ORL4	Joint Objectives have been established among supply chain members					
ORL5	There is practice of Sharing of skill, Ideas and institutional culture along the downstream supply chain					
ORL6	Stable links with partners of the supply chain have been established					
ORL7	The supply chain encourage team building for coordination and cooperation					
BN	**SECTION 4: BENIFITES OF DOWNSTREAM SUPPLY CHAIN ITEGARTION**					

S.N	Description	1	2	3	4	5
BN1	The collaboration of partners throughout the downstream supply chain increase sales volume					
BN2	Created market competitiveness					
BN3	Your profit increased due to supply chain integration					
BN4	You have been helped to decrease the total logistics cost					
BN5	Builds high sustainable customers' satisfaction on the product and service quality					
BN6	Developed high level of responsiveness whenever necessary					
IT	**SECTION 5: IT TOOLS IMPLIMENATION**					
IT1	Your Company Employed advanced Information systems for sharing information with partners					
IT2	Your company Implemented Electronic Data Interchange (EDI) system					
IT3	Your company implemented forecast or demand management system					
IT 4	Your company's information system is linked with BGI Information system to share information					
IT 5	There is a strong collaboration with BGI Ethiopia in implementation of Information Communication Technology tools					

THANK YOU
FOR YOUR VALUABLE INPUT, TIME AND UNLIMITED COOPERATION.

INTERVIEW QUESTIONS TO BGI ETHIOPIA

1. Please explain the areas of collaboration with your distributors and retailers as a supply chain member?
2. Do the company established criteria for supporting its customers? If yes, what are the main criteria for supporting its customers to compete the market?
3. What is the level of involvement of your customers and suppliers in joint planning, forecasting and sharing supply chain information?
4. Please describe your company relationship with customers (Agents).
    a. Generally one-off contracts (under 1 year)
    b. Short term (less than 3 years)
    c. Long term relationships (more than 3 year)
5. What methods have you used to communicate to your Agents on the issue of product distribution and related issues?
6. What is the frequency of information sharing
7. What is the level of ICT utilization in the supply chain and communication with your partners?
8. Tell me about the ICT that use in your SCM?
9. Does the company use online technologies other than e-mail, like, for example, the Internet or an Extranet, to facilitate;
    a. Collaborate with business partners in the design of new products.
    b. Collaborate with business partners to forecast product demand.
    c. Manage capacity or inventories.
    d. Exchange documents electronically with your Customers.
    e. Purchase direct production goods.
10. What are the main benefits of supply chain integration observed throughout downstream supply chain partners?
11. What are the challenges faced for supply chain integration in the downstream supply chain?

Appendix III

Sample Size Determination Using Krejcie and Morgan Table

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

The Table is constructed using the following formula for determining sample size:

Formula for determining sample size

$$s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P)$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

Source: Krejcie & Morgan, 1970

NOTE:
There is no need of using the formula since the table of determining sample size has all the provisions you require to arrive at your sample size.