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Assessing Bottled Water Supply Chain Management: The  
Case of Agmas Water

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A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, SCHOOL  
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CHAIN MANAGEMENT

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## DECLARATION

I hereby declare that the work which is being presented in this thesis entitled “Assessing Bottled Water Supply Chain Management Practices: The Case of Agmas Water” is original work of my own, has not been presented for a degree to any other university and all the materials used for the thesis have been duly acknowledged.

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This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

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# Assessing Bottled Water Supply Chain Management: The Case of Agmas Water

Master of Arts in Logistics and Supply Chain Management

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## ABSTRACT

This thesis was carried out to identify how Agmas Water Factory manages its supply chain in terms of strategic supplier partnership, customer relationship, quality information sharing, and internal operation. This thesis used a descriptive study design and targeted 384 respondents selected from different departments of the Agmas water factory, its suppliers, retailers, distributors and customers. Data was collected using a self-administered questionnaire. Central tendencies such as mean and standard deviation were used to describe the supply chain management practices of Agmas water. There is a moderate supply chain management practices in Agmas water as explained by a rating scale that consists of 5 steps from 1 (strongly disagree) to 5 (strongly agree) which was used to analyze the result of the perception mean. The statistical data (mean) show a maximum of 3.38 and 2.08 minimum value of grand mean for strategic supplier partnership and Internal Operations Practices, 3.10 for customer relationship, 3.01 for level of information sharing and IT, 3.38 for exchange quality of information and 2.91 for Challenges/ Barriers for effective SCM. It is below African best supply chain practices in bottled water industry. Therefore, Agmas water should improve its relationship with suppliers from simply buy-sale relationship to a modern supply chain relationship through establishing strategic or long-term relationship, contract, and continuous information sharing to minimize supply uncertainty which resulted in demand and supply unmatched and dissatisfaction of customers of the company. The researcher has also recommended that future research need to be conducted to expand the domain of SCM practices by considering additional variables.

*Key Word: Bottled Water, Industry Supply Chain, Supply Chain Management*

## **LIST OF ABBREVIATIONS**

CLM	Council of Logistics Management
IT	Information Technology
SPSS	Statistical Package for Social Science
SCR)	Supplier and Customer Relationship
SCM	Supply chain management

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# **Chapter One - Introduction**

This chapter presents the background of the thesis, the objective, the scope and limitations of the thesis. Along with the concept highlighted in this thesis, very important supply chain definition is disclosed. Additionally, the organization of the thesis and the significance of the study are presented. Importantly, this chapter identifies the research gaps appropriately. The research questions are accurately addressed and the main objective of the thesis is achieved.

## **1.1 Background of the study**

The character and extent of business competition has altered in a very different way on that companies no longer compete against other companies. This is because the new basis of business competition lies outside the walls of an organization, and is determined by how effectively companies link their operations with their supply chain partners; suppliers, distributors, wholesalers, retailers and end costumers (Yan and Cheng, 2001). Mattson (2002) added that being able to create business relationships with customers, suppliers and other strategic partners anchored on trust and long-term commitment then becomes a crucial competitive parameter. This is a contemporary lesson for the companies to give greater attention on relationship with customers and suppliers. Subsequently, an organization supply chain has become a strategic agenda driving decision making of specific to their end customers with nature of business.

Accordingly, customers must be willing to buy; suppliers to provide the materials, and people to go to work there and continuity can only be ensured when financial objectives are linked with social involvement and environmental performance (Tencati, 2013). By adding the value-added concepts entirely, companies can concentrate their resources and using them more efficiently, reducing repurchases as well as disposal efforts and costs. This is because the end customers are anyone who purchases specially like the bottled water. Customers purchase it from the retailers. This can be from either a big supermarket, or even a small chain firms like a corner shop. The distributors will depend upon the retailers

themselves meaning, a big supermarket maybe their own distributor where as for the corner shops, they will have to purchase it through wholesalers.

This is because the bottled water industry plays an important role in connecting various companies and make supply chain management noticeable. As a result, the bottled water industry around the world is attempting to perform their tasks in a more justifiable way, responding to the customers need along with the marketing pressure. However, the bottled water industry has been seriously facing the performance related problems, which need a systematic view for the successful management of industry activities throughout the building lifecycle phases. For this reason, there is an increasing interest in the implementation of supply chain management (SCM) principles for improving its product delivery processes as more effective and efficient.

The bottled water industry supply chain typically focuses on the beginning phase of excavating portable water, considering its mission accomplished once the selling of bottled water has been completed. However, it has been found that most of the research is focused on the short-term objective of industry supply chain, which may not respond to the overall business performance and customer satisfactions. Focus of these research studies is mainly limited to the assessment of specific processes and activities such as logistics process, supplier integration, production process and procurement process.

To effectively improve the sustainability in the long-term perspective, industries require the active role of different actors in a supply chain management, with a collaborative working relationship. Therefore, the bottled water supply chain management practice is required with a systematic management of the whole process of production lifecycle phases through the collaboration among different actors and all stakeholders.

## **1.2 Background of the Company**

Agmas Springs is committed to doing business responsibly and seeking opportunities to make a difference. That means investing in its communities and the environment and focusing its efforts around meaningful issues with like-minded partners to enable positive change. Agmas Springs has been awarded by the Ethiopian Conformity and Assessment

Authority for its high quality and Original Taste. The factory lies on a 25,000-sqm area in Ayer Tena.

Agmas Springs has state-of-the-art bottling and manufacturing facility located close to the source – several rich underground wells in Ayer Tena, a mountainous region in the Eastern Addis Ababa, Ethiopia. The water plant can produce 300,000 (600ml) bottles per day. The laboratory is equipped with an ultra-modern monitoring system to track and control all the production activities and the water source as well and is controlled by highly qualified and experienced professionals. The factory's production equipment is sourced from global industry leaders, ensuring a first-class quality product for Agmas Springs consumers.

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### **1.3 Statement of the problem**

The goal of effective supply chain system is to reduce the inventory and waste. With the help of sophisticated software systems such as ERP, it's easier to track flow of all the

activities in supply chain management (Waters, 2009). Regarding product specialized firms, Michael (2013) warned although bottled water has a long shelf life and is unlikely to expire, excess bottles tie up capital, occupy valuable storage space, and offer the potential for damage as they wait to work through excess supply. Due to these reasons, most of previous studies (Michael (2013), Rodwan (2010), Fishman (2007) and Nestle Waters (2010) and others) were specifically conducted to examine the implementation of SCM practices in food and beverage processing industry.

These previous studies were carried out in developed countries which have different economic, political, technology, social, legal and cultural status. As a result, it may be difficult to directly apply and generalize that the same practices and collaboration as well as problems of SCM exists in emerging economy like our country. Omain et al. (2010) argued that the implementation set of SCM practices differ depending on the country and type of organization involve. This means different organizations and countries have a different set of practices in implementing SCM this is due to the fact different managerial perceptions of how supply chain components are related to each other and to the organization example different style of management, different world views from different country and cultural differences. In addition, manufacturing firms found in developing countries are using their own individual efforts to improve their supply chain management based on individual efforts without considering the holistic supply chain theories and management philosophies; they are not as such effective (Olsson and Skjolde, 2008).

Based on a short visit of the company, Agmas Bottled Water producing company has used its own individual efforts to improve its supply chain management without considering the holistic supply chain theories and management. In addition to this, it was observed that the company is unable to provide the forecasted quantity of its products, to the right place and at the right time. Further, shortage of raw materials has been a frequent experience of the company with poor inventory management handling and recording. Accordingly, it was also observed that delivery delays happen recurrently, most of pallets, shrinks and wrap have been damaged and stored on messy warehouse

aisles, main materials like perform and chemicals will be out of stocks frequently. Subsequently, the company faced high transaction and organizational costs problems that are difficult to measure quantitatively, lack of managerial and physical infrastructures. As a result, the firm could not able to expand its market due to poor usage of energy/fuel and high freight costs, increasing labor rates and rising commodity prices mean that operating costs are under extreme pressure.

Since there is no clear set of supply chain practices suitable for all industries or countries. In addition, the indicated supply chain related problems of Agmas water assured that a requirement to understand the existing supply chai practices of the case company. Consequently, one way to address these challenges is to implement supply chain management practices. For this reason, it was intended to study the implementation of modern SCM principles for improving its product delivery processes as more effective and efficient. Therefore, it was tried to assess its supply chain management with a systematic management of the whole process of production lifecycle phases through the collaboration among different actors and all stakeholders.

## **1.4 Research Questions**

This thesis answered the following questions:

- How does Agmas water factory manages its supply chain?
- What are the challenges of SCM of the firm in terms of risk of uncertainty and Bullwhip effect?

## **1.5 Objective of the study**

### **1.5.1 General Objective of the Study**

The general objective of this research was to assess the supply chain management of Agmas water factory.

### **1.5.2 Specific Objectives of the Study**

The specific objectives of the thesis are:

- To describe how Agmas water factory manages its supply chain

- To assess the challenges of SCM of the firm in terms of risk of uncertainty and Bullwhip effect

## **1.6 Scope of the Study**

This thesis was circumscribed to bottled water supply chain management practices of Agmas water factory and it was focused on its supply chain management on its suppliers and customers to provide bottled water products for its customers. This thesis focused on supply chain practices of Agmas water factory, starting with unprocessed raw materials and ending with the final customer using the finished goods. It has focused on the material and informational interchanges in the logistical process, stretching from acquisition of raw materials to delivery of bottled water products to the end users. In this regard, supply chain design decisions include the selection of partners, the location and capacity of warehouse and production facilities, the products, the modes of transportation, and supporting information systems are included.

This thesis was focused on strategic supplier partnership which included quality as number one criterion in selection of suppliers, solving regularly problems jointly with its suppliers, continuous improvement programs that include its key suppliers and actively involve our key suppliers in new product development processes. It also included customer relationship that contained within frequently determine future customer expectation, facilitate customers' ability to seek assistance, interact with customers to set reliability, responsiveness standards and measure and evaluate customer satisfaction. Information sharing, information technology and exchange quality of information sharing were also counted in in this thesis. In addition, this thesis accounted internal operation that encompassed regularly continuous and instantaneous product and service improvement, uses up- to- datedness of production, flexibility of production system and automated production process automation. Finally, this study was restricted to challenges/ Barriers for effective SCM implementation particularly facing supply uncertainty (supplier inability to carry out the promise), trusts its partners to share confidential data

and willing to share risks and benefits faces inventory fluctuation due to inaccurate information sharing (bullwhip effect).

### **1.7 Significance of the Study**

This thesis provides information on practices and experience of supply chain management, sustainable supply chain management, and bottled water supply chain management. Regarding academic and scientific benefits, this thesis extends the implementation of supply chain management approach into the industry particularly bottled water field by defining the main elements that need to be considered in managing its supply chain, providing the unique characteristics of bottled water industry, which make the supply chain management more multifaceted and exploring the supply chain management practices towards sustainable performance. Overall, this thesis will be a future reference for theoretical and empirical studies in bottled water as well as industry management. This thesis will help industry managers by providing the practical guideline to help bottled water companies in managing their supply chain towards effective and efficient management performs as building a better understanding on industry supply chain management, extending the sustainable thinking throughout the production lifecycle and developing a portfolio of supply chain practices towards better performance.

### **1.8 Limitation of the study**

Some of the respondents in the respective firms refused to provide some information in the questionnaires they were distributed with. This was because of confidentiality information companies feared could be spread to their competitors hence the researcher tried the level best to persuade them to provide such information by attaching introduction letter got from Addis Ababa University to identify the researcher as their student or showing student identity card in case of self-administered distribution. However, in other circumstances, some employees and customers had completely neglected to answer the questionnaire distributed to them which reduced the sample size. Some firms failed to submit their questionnaire on time which reduced the sample size.

The researcher mitigated the effect of constraints by constant reminding the selected firms for feedback through phone calls and messages or e-mails.

## 1.9 Definitions of concepts and terms

- **Internal Operation** - summarizes all activities related to production system and internal, logistics flow. To judge the SCM practice as an effective and value adding the internal operation should be flexible in responding to changing market needs, which is expressed on the basis of agility principles (Lambert and Cooper, 2000).
- **Level of information sharing** refers to the extent to which critical and proprietary information is communicated to one's supply chain partner. Many researchers have suggested that the key to make supply chain effective and efficient is making available undistorted & up-to-date marketing data at every node within the supply chain (Tan, 2001; Chen and Paulraj, 2004).
- **Quality of information sharing** includes aspects such as the accuracy, timelines, adequacy, and credibility of information exchanged. As information sharing is vital, its major impact on supply chain management depends on what information is shared, when & how it is shared, & with whom it is shared (Lee and Whang, 2000).
- **Supplier and Customer Relationship (SCR)** is defined as a set of firms' activities in managing its relationships with customers and suppliers to improve customer satisfaction and synchronize supply chain activities with suppliers, leverage suppliers' capacity to deliver superior products to customers (Charles *et al.*, 2014).
- **Supply Chain Management (SCM)** is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model (Supply Chain Visions, 2010).

## **1.10 Organization of the Thesis**

Chapter one contains the introduction to this thesis, statement of the problems, objectives of the thesis, terms and definitions of supply chain related practices including the limitation and delimitation of the thesis. Chapter two includes the key concepts and critical discussions of literature related to supply chain management in bottled industry, recent empirical and theoretical findings and results. This formed the theoretical conceptual framework and model for the thesis. The requirements for industry supply chain, business practices along various studies, suppliers' levels, customers and partner integration are explored. Chapter three outlines the research methodology. Data collection, processing, research design and approaches including ethical considerations are explained. It covers the selection of the sample, the design of the questionnaires, data collecting techniques, processing, analysis and evaluation of data as well as the validity and reliability of methods used. Chapter four focuses on data analysis and interpretation through the presentation and discussion of the results. Sample profiles, tables and graphs are provided. Discussion and summary of interpretations are included. Chapter five concludes, summarizes and discusses noticeable points with various recommendations.

## **Chapter Two - Literature Review**

This chapter presents a literature review about the concept of supply chain management, bottled water factories and related industries supply chain management, supply chain issues and other associated concepts. Supply chain management practices and industry experiences are presented to describe supply chain management practices along with the Plan, Source, Make, Deliver and Return scheme. At the end of the chapter the unique characteristics of industry against the adoption of supply chain management are discussed in conceptual framework.

### **2.1 What is SCM and Its Concepts**

The term supply chain includes all actions associated with the flow and transformation of goods from the raw materials point, through to end users, as well as the associated information flows. Materials and information flows both up and down the supply chain. The supply chain contains all activities of converting materials through the input stage, conversion phase and outputs. SCM is the integrated planning, co-ordination and control of all business processes and activities in the supply chain to deliver superior consumer value at less cost to the supply chain as a whole whilst satisfying requirements of other stakeholders in the supply chain. Totally, SCM recognizes the strategic nature of coordination between trading partners and to explain the dual purpose of SCM: to improve the performance of an individual organization, and to improve the performance of the whole supply chain. The goal of SCM is to integrate both information and material flows seamlessly across the supply chain as an effective competitive weapon.

### **2.2 SCM Mapping**

The basic objective of supply chain management is to optimize performance of the chain to add as much value as possible for the least cost possible. In other words, it aims to link all the supply chain agents to jointly cooperate within the firm as a way to maximize

productivity in the supply chain and deliver the most benefits to all related parties (Finch 2006). In addition Mentzer (2001) has point out the significant importance of SCM as the systematic, strategic coordination of the traditional business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long term performance of the individual companies and the supply chain as a whole. Others authors have suggested primary objective of SCM is to integrate and manage the sourcing, flow, and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers. Furthermore, basic objective of SCM is to synchronize the customers' requirements with materials flow to strike a balance among conflicting goals of maximum customer service, minimum inventory management, and low unit costs (Habib, 2011).

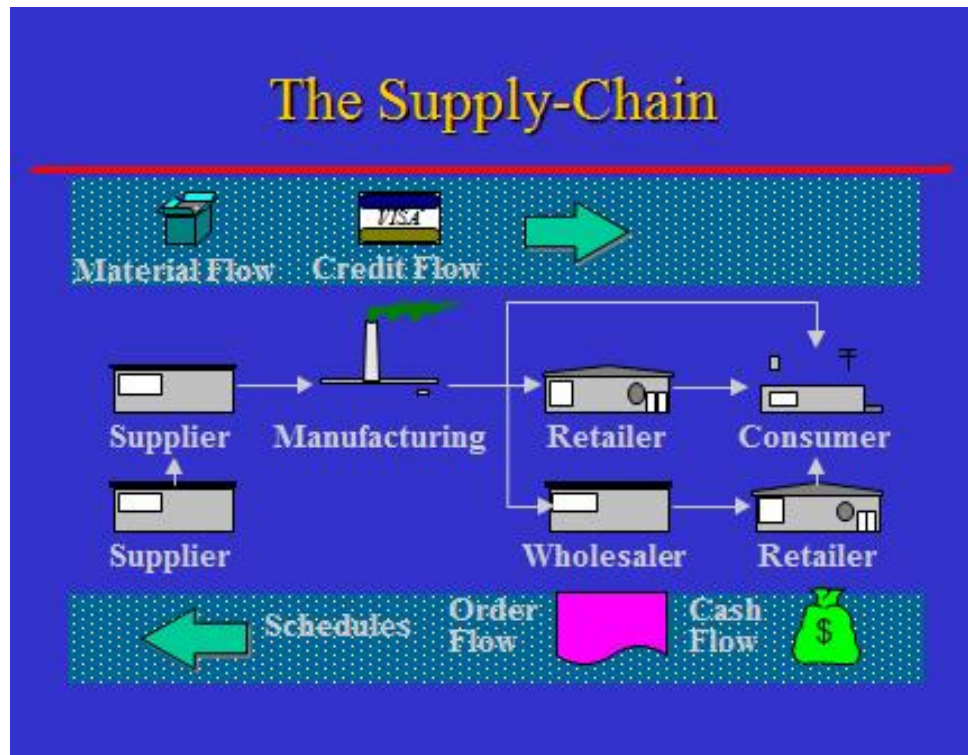


Figure 2:1 Supply Chain Management

### **2.3 SCM in the Process Industry**

In the process industry, raw materials are transformed into finished products on a commercial scale using a sequence of physical and chemical conversions and changes. The process industry includes the manufacturers that produce products by mixing, separating, forming, and/or performing chemical reactions (Cox and Blackstone, 2005), such as the chemical, pharmaceutical, petrochemical, food and beverages, pulp and paper, textiles, rubber and plastics, glass, metal, cement, electricity, coal, tobacco, wood, water treatment, and associated industries. All these industries provide primary products and commodities that are fundamental and essential to our everyday life. Different from discrete industry (e.g., automotive, construction, engineering, and high-tech industry.) and service industry (e.g., media, communication, financial, and education industry), the process industry is characterised by the production in process that can be convergent and divergent as well. The products of the process industry can be the intermediate and final products at the same time, which can be sold to ultimate customers or used to produce other products (Kannegiesser, 2008). The process industry is also a key portion in the world economy.

### **2.4 Bottled Water**

Water in a plastic bottle might not be the most exciting product category, but sales of bottled water have registered nearly continuous growth for more than three decades. The idea of bottling water began in Europe in the 1700s, when mineral spring water was bottled and sold for its reputed healing properties. In the early twentieth century, bottled water in Europe offered a safe alternative to unsanitary tap water in many areas. Bottled water entered the U.S. market much later; sanitization of public water had been available there since early in the twentieth century. But consumption of bottled water in the United States saw rapid increases in the 1990s and 2000s, rising from 9.8 gallons per person in 1992<sup>i</sup> to 27.6 gallons per person in 2009.<sup>ii</sup> Overall, consumption of bottled water grew a thousand-fold between 1984 and 2005.<sup>iii</sup> The drivers of this increase were numerous and varied: an aging municipal water infrastructure; a perception that bottled water was safer

and tasted better than tap water; iv and greater mobility that required convenient, portable water delivery methods (Michael et al., 2013). Another important growth driver was the increased focus on healthy diet and lifestyle choices, in which proper hydration and avoidance of sugary drinks both play important roles. People who consume bottled water regularly are twice as likely to cite health concerns as a factor in their beverage choices than those who do not (Shook et al., 2009). Furthermore, the increase in bottled water consumption was accompanied by a greater share of households using water filters at home. Overall, water made up 41% of the beverages Americans consume, and bottled water constituted nearly one-third of total water consumption.

Bottled water sold in many sizes and formats, bottled in both glass and various types of plastic bottles, but 70% of water sold in the United States used a “single-serve” format and came in polyethylene terephthalate (PET) plastic bottles (Michael et al., 2013). Bottled water also can be classified into several subcategories, such as carbonated, mineral, artesian, spring, purified, and deionized. None of these varieties include flavorings as such, though added minerals can enhance flavor. Water comes from various sources or goes through several processes, depending on its labeling. The most common label is pure or purified water. Purified water may be from any acceptable source, including springs or municipal sources, but the dissolved solids must be removed from it using distillation or reverse osmosis. Spring water comes from underground and rises to the surface without active extraction. Mineral water may be from any source but contains a minimum level of minerals. Regardless of the source, all bottled water must be sanitized and filtered (Kannegiesser, 2008).

## **2.5 Dimensions of Supply Chain Practices**

In relation to dimensions of supply chain, extensive literatures were reviewed to identify different dimensions of the supply chain management practices. The rationale used in these studies focused on the selection of supply chain management practices which cover both the upstream and downstream sides of the supply chain (Li *et al.*, 2005). Specifically, to capture the holistic perspective of supply chain management, an extensive

analysis of different SCM practices was conducted by Chen and Paulraj (2004). From their thesis, three important supply chain management dimensions were identified. These dimensions include long term relationships, concurrent engineering and strategic purchasing. All the above-mentioned dimensions selected from the literature attempt to explore the supply chain management construct in a holistic manner rather than being limited only to certain practices covering one aspect of the SCM domain, production, and finance and help in reduction of lead time. Asha (2015) investigated the understanding, practical implementation of SCM practices towards organizational performance in food processing firms located at Dar es Salaam, Tanzania. Six key dimensions of SCM practices (strategic supplier partnership, customer relationship, quality and level of information sharing, outsourcing and lean practices) were used as variables accompanied by different measurement instruments under each variable, while market and operational/financial performance variables were used to measure the organizational performance.

## **2.6 Review of Empirical Studies**

Throughout the years, the nature of competition has transformed to the extent that companies no longer compete against other companies on the bases of quality as traditionally practiced in the many years ago. Nowadays, the new source of business competition lies outside the walls of an organization, and is determined by how effectively companies link their operations with their supply chain partners; suppliers, distributors, wholesalers, retailers and end costumers. Being able to create business relationships with customers, suppliers and other strategic partners anchored on trust and long-term commitment then becomes a crucial competitive parameter. For this, and factors like shorter product lifecycle and customer expectations, businesses have had to invest and re-focus greater attention on relationship with customers and suppliers.

Consequently, various studies have been conducted to define the supply chain practices and reviewed organizations supply chain as a strategic agenda driving decision making at senior management level. SCM practices are defined as a set of activities undertaken in

an organization to Promote effective management of its supply chain. Many manufacturers and distributors are waking up to the potential for the major cost reduction and service improvements offered by implementing best practices in their supply chain. A number of literatures show many different perspectives of SCM practices (Tan *et al.*, 2002; Chen and Paulraj 2004; and Li, 2002 and 2005). These different writers' perspectives suggested a multi-dimensionality of SCM that covers set of activities and processes from upstream, firm's internal operations to downstream of the supply chain. Supply Chain Management is now recognized as a critical business process for companies manufacturing or distributing products. This is because customers' demand for most products are ever more demanding in response time, in choice and in seeking more competitive prices and thanks to globalization, customers can choose from an increased number of suppliers. There are five basic dimensions/perspectives of supply chain management practices. These are namely; supplier and customer relationship, information sharing, internal operation, information technology and training (Charles *et al.*, 2014; Froehlich and Westbrook, 2001).

### **2.6.1 Supplier and Customer Relationship (SCR)**

Supply and customer relationship is defined as a set of firms' activities in managing its relationships with customers and suppliers to improve customer satisfaction and synchronize supply chain activities with suppliers, leverage suppliers' capacity to deliver superior products to customers. The ultimate objective of SCM is to deliver products to the satisfaction of end customers (Charles *et al.*,2014). The customer relationships include the complete range of practices that are employed for the purpose of managing customer complaints, building long-term relationships with customers & improving customer satisfaction (Li *et al.*,2006). Close customer relationship allows a company to be more responsive in fulfilling customers' demand and differentiate its product from competitors, sustain customer loyalty, and dramatically extend the value it provides to its customer through improving customer satisfaction by proactively seeking customers' needs and requirements. The ability to build a close relationship with customers will

bring companies in to a long-lasting competitive edge (Charles *et al.*, 2014). SCM suggests that firms need to integrate with their suppliers and customers to achieve both financial and non-financial growth objectives (Tan, 2001). Chen and Paulraj (2004) asserted that, the industry leaders increasingly build competencies to integrate with suppliers and customers and find that, these competencies lead them to supply chain excellence. Coordinating operational activities through joint planning with suppliers also results in inventory reduction, smoothing production, improve product quality, reducing supply uncertainty and lead time reduction.

### **2.6.2 Internal Operation**

SCM also emphasize on the importance of both effectiveness and efficiency of firm's internal operations on its performance. The significant element of SCM practice is an internal operation and which is the basis for developing a competitive advantage before embarking into external integrations. Poor internal operations can lead to failure in coordinating with external partners (Tan and Wisner, 2003). Internal operation summarizes all activities related to production system and internal logistics flow. To judge the SCM practice as an effective and value adding, the internal operation should be flexible in responding to changing market needs, which is expressed on the basis of agility principles. This means that, a production system must be able to perform rapid change over in both order patterns and mass customization (Lambert and Cooper, 2000). Power and Soha (2001) found that technology utilization, continuous improvement and computer based automation in manufacturing are some of characteristics of agile/flexible organization. Thus, the effectiveness of SCM can be examined by the ultimate effect it would have on customer satisfaction through responsiveness and lower price resulting from lean internal operations. Automated orders and automated productions are the key enablers to realize the quick response program (Perry and Sohal, 2000).

### **2.6.3 Information Sharing**

Information sharing serves as an essential approach for the survival of enterprises and enabler of supply chain integration. Currently, with the advancement in information and

communication technology, information sharing has become more conceivable. Furthermore, information sharing in supply chains has become more efficient by the global introduction of long- term cooperation and coordination which leads ultimately to the improvement of companies' competitive advantages. There is a lack of information sharing within companies nowadays, which results in inefficiency of coordinating actions within the units in the company or organization (Power and Soha, 2001). Information sharing is a vital aspect in achieving perfect integration in a supply chain. Cross functional integration and inter organizational integration requires the visibility of information across the supply chain. Poor information sharing between partners in a supply chain will result in poor coordination that will lead to many serious problems such as high inventory levels, inaccurate forecasts, low resource utilization, and high production costs. Indeed, information sharing is highly considered as the way to reduce demand uncertainty (Lee and Whang, 2000). Studies have reported that information sharing can bring many benefits to both suppliers and buyers, such as inventory reduction, and reduced manufacturing costs (Raghunathan, 2003). Thus, Raghunathan stated that an informatics perspective is vital in the supply chain since information flow is an integral part of SCM and material flow is closely dependent on information flow.

Implementation of supply chain management requires integration of processes between supply chain members in all functional areas, including sourcing, manufacturing and distribution. The need for the successful implementation of information Sharing has been identified as being critical to effective innovation and development of supply chain management at an industry and enterprise level. Information sharing in Supply Chain Management (SCM) is receiving attention among the Indian manufacturing industries for achieving global competitive advantage. Information sharing is a key ingredient for any SCM system (Moberg et al., 2002). Information sharing has the potential to offer substantial benefits to supply chain members at several levels. Information sharing improves coordination among supply chain members that leads to high levels of supply chain integration. Information sharing influences the supply chain performance in terms of total cost and service level. Information sharing among supply chain members can

reduce different kinds of uncertainties related to demand, product and technology that add costs to supply chain processes. The information sharing facilitates to enhance the efficiency and effectiveness of supply chain as it inherits certain advantages. These advantages include better coordination between different departments, better coordination between supply chain members and better control of the supply chain processes, reduced product design time, shorter production lead-time and stable outputs with consistent quality (Zhao and Xie, 2002).

#### **2.6.4 Level of information sharing**

Information sharing ensures that the right information is available for the right trading partner in the right place and at the right time; supply chain visibility. It offers the potential to prevent, detect, and resolve exceptions spontaneously, and creates unprecedented levels of efficiency in collaborative supply chains (Lee and Whang, 2000). Tan (2001) defined level of information sharing as the extent to which critical and proprietary information is communicated to one's supply chain partner. Chen and Paulraj (2004) also stated that the key to make supply chain effective and efficient is making available undistorted & up-to-date marketing data at every node within the supply chain. The effect of information sharing on SCM depends on what information is shared, quality on shared information, and company's capability in using and translating the information in to a supply chain strategy and operational activities (Lee and Whang, 2000). According to Lee and Whang (2000), poor information sharing between partners in a supply chain will result in poor coordination that will lead to many serious problems such as high inventory levels, inaccurate forecasts, low resource utilization, and high production costs. Indeed, information sharing is highly considered as the way to reduce demand uncertainty. Information sharing can differ from strategic to tactical and from information about logistics activities to general market and customer information. Cross functional integration and inter organizational integration requires the visibility of information across the supply chain. In general, based on the degree of collaboration and the number of participants, supply chains could be classified into three categories: partner

collaboration, value chains, and supply networks (Chopra and Meindl 2001). According to them, partner collaboration is the first level of supply chain collaboration. At this level, partnership would be bilateral or multilateral, but one partner assumes the leading position in the collaboration. The typical case is that a company seeks external assistance to leverage one or more of several supply chain performance drivers: inventory, transportation, facility and information. They indicated traditional third-party logistics (3PL) as example. It can be used to improve the efficiency of transportation by outsourcing. Vendor managed inventory (VMI) is another type of partner collaboration based on sharing inventory information. Information sharing at this level is usually limited and unidirectional. On other hand, Raghunathan (2003) stated a value chain that results from the vertical alignment of multiple trading partners, such as distributor, retailer, supplier, and manufacturer. At this level, trading partners collaborate on upstream processes or downstream processes, or both. Typically, all trading partners have a peer relationship and are heavily dependent on each other. Through intense collaboration, they leverage the inventory, transportation, facility and information to maximize the total benefit of the supply chain. A value chain is based on intensive information exchange through business documents or, more formally, data objects, such as inventory status, actual demand, and various forecasts.

### **2.6.5 Exchange Quality of Information Sharing**

Quality of information sharing includes aspects such as the accuracy, timelines, adequacy, and credibility of information exchanged. As information sharing is vital, its major impact on supply chain management depends on what information is shared, when & how it is shared, & with whom it is shared. Supply chain participants affect the quality of information by different interests and opportunities. While information sharing is important, the significance of its impact on SCM depends on information by all functional elements within the supply chain as a key competitive and distinguishing factor. The empirical findings of Childhouse and Towill (2003) reveal that simplified material flow, including streamlining and making highly visible all information flow

throughout the chain, is the key to an integrated and effective supply chain. Providing and transforms raw material to a product or service and delivers it to the customer is activities that is done in the supply chain. Overall planning of supply and demand, raw material procurement, production planning, inventory control, warehousing, distribution of products and management of information is activities in the supply chain. The quality of the shared information becomes a critical aspect of effective supply chain practice (Raghunathan, 2003). Consequently, organizations need to view their information as a strategic asset & ensure that it flows with minimum delay and distortion (Lee and Whang, 2000). It is understood that manufacturing organization in the supply chain should be able to consider inventory demand and according to the number products in stock identified a fraction number the product and do production planning. By determine production schedules, do raw material supply and the schedule of production, distribution of products as well is planned through sharing quality information. It appears that there is a built in reluctance within organizations to give away more than minimal information since information disclosure is perceived as a loss of power.

#### **2.6.6 Information Technology (IT)**

Currently, since IT is involved in every step of operation in each company, therefore it is not surprising that organizations' Supply Chain Management supported by adopting IT. In SCM, IT is highly regarded as a major enabler in achieving effective SCM. As a supply chain spans many organizations in developing products to customers both up-stream, downstream and many functional areas within a company, the implementation of IT allows the companies to increase communication and coordination of various value adding activities with their partners and between functions within their own operation. In addition, to advance development of the internet technology offers significant opportunities for cost reduction, increasing flexibility, increasing response time, and improving customer services (Lee and Whang, 2001). In SCM, IT is highly regarded as a major enabler in achieving effective SCM. As a supply chain spans many organizations in developing products to customers both up-stream, downstream and many functional

areas within a company, the implementation of IT allows the companies to increase communication and coordination of various value adding activities with their partners and between functions within their own operation. Regarding the benefits of IT in SCM, it does not come from the capabilities of IT itself; instead the significant benefits come from the combination of its application with corporate strategy and the nature of relationship between companies. IT will improve collaboration and coordination between supply chain members in the environment where trust and long-term commitment between partners exist (Li et al, 2005). They also revealed that, the objectives of IT in SCM are; to provide the information availability and visibility to supply chain partners, to enable the collaboration with organizations in the supply chain and to allow the decision making based on the total supply chain information.

### **2.6.7 Challenges /Barriers of Supply Chain Management**

SCM related-problems mainly occur from uncertainties and an inability to co-ordinate several activities and partners (Raghunathan, 2003). He identified top ten barriers to supply chain management these are: Inadequate information sharing, Poor/conflicting measurements, Inconsistent operating goals, Organizational culture or structure, resistance to change- lack of trust, poor alliance management practices, lack of supply chain vision (understanding), lack of managerial commitment, constrained resources and no employee dedication/ empowerment. Currently, companies are striving for lower cost so that they will be competitive in the market while they have to maintain their service level. The key factor to offering the features that the customers want at the level of service they are willing to pay for is to minimize the lead time. One approach suggested to solve this problem is synchronized material movement where all parts of the supply chain have access to the information at the same time (Waters, 2003).

The SCM help in reduction in the inventory, accurate information sharing and develop trust among the SC partners. Yet, despite these important benefits, organizations continue to encounter a barrier which hinders them from effective implementation of supply chain. These barriers are known as SCM barriers. They exist between inside and outside of

manufacturing organization. unclear organization objective, lack of top management commitment and support, short-term decision-making perspectives, lack of information technology, poor ICT structure, lack of education and training to employee and supplier employee, lack of necessary tools management skills and lack of motivation and employee involvement are some of barrier exist within manufacturing organization while resistance to change, lack of measurement system ,unwillingness to share information among supply chain partner, lack of inter-organizational cooperation and coordination are barrier outside manufacturing organization (Vishal and Shah, 2016). Chopra and Meindl (2007) designated the supply chain as consisting of the parties who are involved in satisfying the customer demands. The members of supply chain are included the manufacturers and suppliers, warehouses retailers, transporters and customers and other which are all players of supply chain. Thy stated that the supply chains more clearly as one firm producing a raw material and selling it to the second firm which then uses raw material and turns it to a component. The third firm buys this component from the second firm and assembles the component into a product sold to the fourth firm which might be a wholesale distributor. This firm distributes the product to the retail merchants who finally sell this product to the end users (customers). The set of firms which pass these materials forward can be referred to as a supply chain.

### **2.7 Other Issues Related to SCM Practices**

Using factor analysis, Tan and Wisner (2003) identified: supply chain integration, information sharing, customer service management, geographic proximity, and JIT capability, as the key aspects of SCM practice. Chen and Paulraj (2004) used long-term relationship, cross-functional teams, supplier base reduction, and supplier involvement. They identified long-term relationship, information sharing, vision and goals, risk and award sharing, cooperation, process integration, and supply chain leadership underlying the concept of SCM. Asha (2015) investigated the understanding, practical implementation of SCM practices towards organizational performance in food processing

firms located at Dar es Salaam, Tanzania and found that majority of Tanzanian food processing firms understood the concept of implementing SCM practices.

The level of practical implementation was uneven practiced that is only strategic supplier partnership, customer relationship, quality of information sharing and lean practices were practiced at great extent. However, despite the increased attention paid to SCM, the literature has not been able to offer much by way of guidance to help the practice of SCM. This has been attributed to the interdisciplinary origin of SCM, the conceptual confusion, and the evolutionary nature of SCM concept. There is no generally accepted definition of SCM in the literature. The concept of SCM has been involved from two separate paths: purchasing and supply management, and transportation and logistics management. The evolutionary nature and the complexity of SCM are also reflected in the SCM research. Much of the current theoretical/empirical research in SCM focuses on only the upstream or downstream side of the supply chain, or certain aspects/perspectives of SCM. Finally, as Anant (2012) indicates organizations seldom achieve the competitive advantage offered by supply chain management technique. In addition, researchers have not comprehensively answered key questions such as what are the linkages between different dimensions of SCM and what are the linkages between the underlying dimensions of SCM and SCM performance.

Based on a comprehensive literature review, a theoretical framework and propositions are derived. In culmination, the description for possible findings and implications of the study for managers is considered. Overall, it is accepted that increased interaction between important constituents of supply chain management will enhance the organization's ability to meet desired goals. In this thesis, the focus is on the set of activities undertaken in an organization to promote effective management of its supply chain. As it is the latest evolution of SCM practices, which include supplier partnership, outsourcing, cycle time compression, continuous process flow, and information technology sharing.

According to Rodwan (2010) and Ahsa (2015), having this practices in a typical organization is not sufficient to judge an enterprise's SCM as integrated and efficient or

generally poor. They state that each practice should be measured for their appropriate level of integration and efficiency. To this end, the parameters of supporting elements that were used to measure the efficiency and integration level are collaborative SCM, information systems and leadership. On the other extreme, literatures indicate that SCM is not an easy-going management system; it has many challenges especially bullwhip effects and uncertainties associated with strategic planning and implementation.

## **2.8 Summary of Literature Review and Literature Gap**

Supply Chain Management practices is defined as a set of activities undertaken in an organization to promote effective management of its supply chain (Lee and Whang, 2000). Different researchers have found that by implementing different SCM practices will execute to the improvement of firm performance. Levi *et al.*, (2003) describes that purchasing, quality and customer relations in his empirical study are the SCM practices that will help to improve firm performance while Hau *et al.* (2004) expressed that SCM practices include outsourcing, supplier partnership, cycle time compression, continuous process flow and information technology sharing. They uses long-term relationship, supplier base reduction, cross functional teams, communication and supplier involvement for SCM practices in their study. Overall different researchers employed different SCM practices to present on their study and only seven dimensions of SCM practices were examined in this thesis.

The empirical review shows that supply chain practices are an essential component in making supply chain decision in an organization. Supply chain enables an organization to match its demand and supply of goods and services to customers. This enables an organization to achieve on time delivery of goods and services, coordination of activities, improved decision making process and reduced communication costs. Studies by Lockamy and McCormack (2004), Lee and Kim (2002) and Lee and Kim (2002) have concluded that supply chain practices contributes to customer satisfaction, need fulfillment and the overall business performance of the firm in manufacturing sectors. Despite an ongoing discussion in research as well as management journals for more than

two decades, SCM remains to be an unclear expression. The large amount of research in the SCM area, and the fact that SCM spans over several disciplines (Tan, 2001), has led to a wide range of definitions, expressions and concepts (Larson and Halldorsson, 2004; Mentzer et al., 2001). The discussions and conclusions about SCM are seldom based upon rigorous theory (Bechtel and Jayaram, 1997) or empirical material (Lee and Whang, 2000; Stank et al., 2001) and SCM literature therefore often becomes superficial and comprehensive. In addition, empirical studies indicate that many of the expected and practices of SCM in developing countries have not been realized. Hence there seems to be a gap between the ideal SCM theory and its industry application in existing supply chains, i.e. SCM practice. In addition, most of these studies show the effect or impact of supply chain on performance and they do not show the real practices of supply chain management in bottling industries. This study seeks to address the question: what is the role of supply chain practices in satisfying customer needs and customer services on the performance of bottling company of particularly in Agmas water and in Ethiopia generally.

## **2.9 Conceptual Framework of the Study**

Kushwaha (2012) proposed that SCM practices include information and communication technology practices, strategic sourcing and supplier relationship practices, supply chain manufacturing practices, inventory and warehousing management system, transportation and distribution management system, and customer relationship management. Sukati et al. (2012) targeted three impacts of SCM practices (strategic supplier partnership, customer relationship and information sharing) on supply chain performance. Toyin (2012) used five dimensions to measure SCM practices including strategic supplier partnership, customer relationship, postponement, level of information sharing and quality of information sharing. Besides, Sukati et al. (2013) suggested three relationships from perspectives of internal-firm, firm-supplier and firm-customer to implement SCM practices. While many efforts proposing a model of SCM constructs have been made,

there has been no clear convergence on a single unifying construct to incorporate all facets of SCM.

Accordingly, the relationship of the conceptual framework is described and the implication is mentioned here under. After going through tremendous literatures (journals, articles and supply chain related books), the researcher has tried to describe the conceptual frame work of this thesis in seven essential parts: strategic supplier partnership, customer relationship, information sharing, quality of information sharing, internal operation, information technology and challenges/ barriers for effective SCM implementation. Other variables have been uninvolved like supporting elements of integration and efficiency, uncertainty, demand variability and others. According to Rodwan (2010) and Ahs (2015), having these practices in a typical organization are sufficient to judge an enterprise's SCM as integrated and efficient or generally effectiveness of SCM. To this end, the parameters of supporting elements that were used to measure the efficiency and integration level are partnership, SCM information systems and quality information. On the other extreme, literatures indicate that SCM is not an easy-going management system; it has many challenges especially bullwhip effects and uncertainties associated with strategic planning and implementation. According to the conceptual frame work companies that are able to pass through all the practices in an integrated and efficient manner having red off impediment can provide a better customer service which is the ultimate goal of SCM.

## **Chapter Three - Research Methodology**

The research design, research methodology and data analysis are presented in this chapter to answer the research questions and achieve the main objective of this thesis. Data collection, processing, research design and approaches including ethical considerations are explained. It covers the selection of the sample, the design of the questionnaires, data collecting techniques, the processing, analysis and evaluation of data as well as the validity and reliability of methods utilized.

### **3.1 Description of study area**

This thesis was conducted on Agmas Water factory in Addis Ababa, Ethiopia. Located in the outskirts of Addis Ababa, Agmas was established in 2014 out of the desire to share the earth's premium water with the world. Within this short time, this bottled water is available in leading hotels, fine restaurants, retail locations, high-class lounges and supermarkets. The factory lies on a 25,000-sqm area in Ayer Tena in Addis Ababa. The water plant can produce 300,000 (600ml) bottles per day. The laboratory is equipped with an ultra-modern monitoring system to track and control all the production activities and the water source as well and is controlled by highly qualified and experienced professionals. The factory's production equipment is sourced from global industry leaders, ensuring a first-class quality product for Agmas springs consumers. The plant also has employed over 300 people. Agmas Springs is committed to doing business responsibly and seeking opportunities to make a difference. That means investing in its communities and the environment and focusing its efforts around meaningful issues with like-minded partners to enable positive change. Agmas has been awarded by the Ethiopian Conformity and Assessment Authority for its high quality and Original Taste. It has have also acquired an international patent right for our unique bottle design.

### **3.2 Research Approach**

There are three types of research approaches (Creswell and Plano Clark, 2007): the first one is qualitative research that involves emerging questions and procedures, data typically collected in the participant's setting. The second one is quantitative research; it is a means for testing objective theories by examining the relationship among variables. The third one is mixed method research, it also an approach to inquiry that combines or associates both qualitative and quantitative forms. Mixed method research is an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study (ibid). Thus, it is more than simply collecting and analyzing both kinds of data; it also involves the use of both approaches in tandem so that the overall strength of a study is greater than either qualitative or quantitative research. Accordingly, this thesis used mixed approach that uses both qualitative and quantitative forms. As quantitative approach, this thesis investigated SCM practices based on fundamental theories, principles and management philosophies. Moreover, the thesis assessed the challenges related to SCM practices based on fundamental theories, principles and management in selected bottled water producing firm in Addis Ababa.

### **3.3 Research Design**

This thesis was basically intended to investigate SCM practices based on fundamental theories, principles and management philosophies that are supposed to be effective parameters just to evaluate the actual performance of the case company's key business activities. Accordingly, the case company's existing SCM practices and the challenges those prohibited its effectiveness were evaluated. That means the purpose of this thesis was to find out the underlying facts and /or actual circumstances existing within the case company regarding SCM practices and describing the facts. Therefore, the researcher preferred to use descriptive research design, which helps to use both qualitative and quantitative data analysis.

### 3.4 Population of the Study

To perform this thesis, the target population is composed of retailers, suppliers, distributors, employees and the executives of Agmas bottled water producing enterprise.

The details population size was indicated below:

- The entire member of staff 60 workers and their supervisor who are currently work in supply chain and related functions of the company.
- 12 section managers which is working closely with supply chain section due to their work nature.
- 44 suppliers which is working closely with supply chain due to their work nature
- More than 10, 000 Customers

### 3.5 Sampling Design

To determine the sample size the researcher preferred to use a method indicated by Malhorta (2007). According to him, the population is unknown, a minimum of 384 responses are sufficient. It is considering the population is unknown as the customers size is unknown. The required sample size was around 384 for this population with a 5% margin of error and a 95% confidence level (Z-score is 1.96 for a 95% confidence level).

Here's the formula:  $SS = (Z\text{-score})^2 * p*(1-p) / (\text{margin of error})^2$

$$SS = (1.96)^2 * 0.5*(1-0.5) / (0.05)^2$$

$$SS = 3.8416 * 0,25 / 0.0025$$

$$SS = 384.16$$

From the targeted sample, a total of 384 respondents from customers, suppliers, distributors, employees and executives of the company were involved in this thesis. It can be said that the respondents are from different functions at different levels of supply chain. During conducting this thesis, out of 384 target population, 60 employees of Agmas, 12 section managers and 44 suppliers. The remaining size of the sample (268 in number) allocated for customers as a sample unit by taking into consideration the time and its manageability.

### **3.6 Data Type and Sources**

The researcher used primary and secondary data for the entire analysis of this thesis. The information was collected through questionnaire from the selected sample of respondents/ employees of Agmas water. The data collected from the respondents through questionnaires was used as primary data. According to Kothari (2006), primary data is the information that the researcher finds out by him/herself regarding a specific topic. It implies that the information resulting from it is more consistent with the research questions and objectives.

### **3.7 Data Collection Methods**

Documentary sources such as relevant books, journals, articles, official publications, newspaper clippings, reports and seminar papers were utilized to present the facts and to substantiate the arguments to secure secondary data. In primary data, interviews, questionnaires and observation, was be used to collect data.

#### **3.7.1 Questionnaire**

In this thesis, questionnaires contained both, structured and unstructured questions. The researcher used questionnaires because they cover a large sample of respondents in the shortest possible time and using low costs. For this thesis, the main data collection method was questionnaire. A structured questionnaire with list of questions was used with probes to elicit relevant information. The survey questionnaire instrument was comprised of two sections: demographic and supply chain management related questions. Each respondent was given a consent form to read and sign before completing the questionnaire and the primary researcher explained the procedure of the questionnaire and written instructions were also provided. The questionnaire was adapted from Asha (2015). The questions were designed to be answered in a five-point Likert scale format for the supply chain concepts and practices and multiple choice or categorical variables relating to respondent demographics. The main part of the questionnaire was designed in a 5-point Likert scale ranging from 1= strongly disagree 5= Strongly agree.

### **3.7.2 Reliability and Validity Tests**

- **Reliability** - this study will use Chronbach's alpha to assess the internal consistency of variables in the research instrument. Chronbach's alpha is a coefficient of reliability used to measure the internal consistency of the scale. According to Zikmund (2010), scale with coefficient alpha between 0.6 and 0.7 indicate fair reliability so for this study a Chronbach's alpha score of 0.70 or higher is consider adequate to determine reliability.
- **Validity** - Validity is the extent to which difference found with measuring instrument reflecting true differences among those being tested. In order to ensure the quality of the research design content and construct validity of the research will be checked. Construct validity establishing correct operational measures for the concepts being studied (John, 2007). The literature review is conducted and thoroughly examined to make sure that the content of measuring is relevant to the study and experts' opinion were taken.

### **3.7.3 Interview**

In this study, various interview sessions were conducted as a method of data collection instrument. It was assumed a useful data collection instrument in this study as it is an advantage to obtain detailed information about personal feelings, perceptions and opinions. It allowed more detailed questions to be asked, and it also achieves a high response rate. Semi structure interview was conducted for the purpose of investigating the participants understanding the practice of supply chain management in bottled water.

## **3.8 Measurement Instruments of Variables**

The general objective of this thesis was to assess the current supply chain management practices of Agmas water factory. To do so, the measurement instrument of variables was Likert scale for perceived data. A five-point Likert scale was prepared and it was

rated the respondents' agreement on the stated questions. The following are the variable constructs of the thesis:

1. **Strategic supplier partnership** – using quality as number one criterion in selection of suppliers, solving regularly problems jointly with its suppliers, continuous improvement programs that include its key suppliers and actively involve our key suppliers in new product development processes
2. **Customer relationship** – frequently determine future customer expectation, facilitate customers' ability to seek assistance, interact with customers to set reliability, responsiveness etc standards and measure and evaluate customer satisfaction
3. **Information sharing** – sharing share delivery scheduling data with our most important suppliers, design and manufacturing data with most important suppliers, order, demand, and forecast information and inventory, production, sales information with our most important suppliers
4. **Exchange Quality of information sharing** - information to partners timely, exchange information to partners accurately, exchange complete information to partners and adequate information to partners
5. **Internal Operation** - Shows regularly continuous and instantaneous product and service improvement, uses up- to- datedness of production, Has flexibility of production system and uses automated production process automation
6. **Information technology** - use uninterrupted IT system, uses IT-based automated ordering system, uses up-to-datedness of IT technologies throughout the supply chain and has adequate IT systems throughout the supply chain
7. **Challenges/ Barriers for effective SCM implementation-** Faces supply uncertainty (supplier inability to carry out the promise), Trusts its partners to share confidential data and willing to share risks and benefits Faces inventory fluctuation due to inaccurate information sharing (bullwhip effect)

### **3.9 Data Analysis Method**

Data and information that was collected during the thesis is reduced into summary form that was processed by using Software Package for Social Scientists (SPSS). The findings of this thesis were organized and presented in the form of words, numbers and percentages by using tables. Data collected from questionnaires were presented in tables and figures and the central tendency of a distribution was taken as it is an estimate of the "center" of a distribution of values. In addition, standard deviation was used as a measure of dispersion refers to the spread of the values around the central tendency. This thesis also uses descriptive research to draw comparisons between other respondents in various studies.

### **3.10 Ethical Considerations**

As of academic institution, the proposed research thesis was reviewed by Addis Ababa University School of commerce maters of arts board to ensure that study procedures are appropriate. In dealing with the respondents and company officials, the researcher followed a code of ethical principles published by the American Psychological Association, which requires investigators to obtain informed consent from all subjects, protect subjects from harm and discomfort, treat all research data confidentially and explain the experiment and the results to the subjects afterwards. Thus, the above ethical guidelines used in order to address ethical considerations aspect of this thesis in an effective manner. In addition, voluntary participation of respondents in this thesis was the main input of the thesis. Moreover, high care was taking to not use offensive, discriminatory, or other unacceptable language in the formulation of questionnaire and interview. Privacy and anonymity or respondents is of a paramount importance of this thesis. It mostly acknowledged works of other authors used in any part of the dissertation with the use of Harvard referencing system. Similarly, it also determines that appropriate sample sizes and procedures are used in the experiment and that respondents were given proper care.

## Chapter Four – Results and Discussion

### 4.1 Response Rate

At the same time as in the method part of this thesis described, the researcher administered research instruments to 384 thesis participants that comprised staff members of the Agmas Spring Water PLC, customers and suppliers.

Table 4.1: Respondents Rate

Respondents	Target	%	Responses Count	Response Rate %
Member of staff and their supervisor	60	16%	50	16%
Section managers which	12	3%	11	4%
suppliers	44	11%	33	11%
Customers	268	70%	214	69%
Total	384	100%	308	100%

Source: Its own study, 2018

The thesis covered all 60 workers and their supervisor, 12 section managers and 44 suppliers (a total of 116 respondents) and other were customers who were selected based on random sampling. These respondents addressed as per their arrival or availability at the case company. Accordingly, 384 questionnaires, more than 80% of the total questionnaires distributed, were properly completed and returned. In this thesis, most of the employees and suppliers had worthy knowledge of the company and had proper suppliers' experiences as they worked more than two years in surveying company. Similarly, this thesis tried to gather information about respondent that shows an access working with suppliers directly or indirectly.

## 4.2 Analysis of the Measurement

Cronbach's alpha reliability test was run on the data collected to determine the reliability of the data. This thesis used Chronbach's alpha to assess the internal consistency of variables in the research instrument. The table below indicates that the reliability test based on each dimension and employed Chronbach's alpha to assess the internal consistency of variables in the research instrument. Chronbach's alpha is a coefficient of reliability used to measure the internal consistency of the scale.

Table 4.2: Cronbach's Alpha Reliability Test Results

Reliability Statistics		
Dimension of the Service Quality	Cronbach's Alpha	N of Items
Strategic supplier partnership	.805	4
Customer relationship	.763	4
Quality information sharing	.716	4
Information sharing	.798	4
Internal Operation Practices	.819	4
Information technology	.736	4
Challenges for SCM implementation	.829	4
Overall reliability test	.907	28

Source: Its own study, 2018

The results showed that all the reliability statistics values are above 0.750 with 308 cases validate at 100 % or no missing value is recorded. Regarding the acceptable value, (Kothari, 2004) recommends that the minimum of 0.70 would be an acceptable level. According to this table, each dimension scale had a coefficient alpha more than 0.70 that indicated a strong reliability and considered adequate to determine reliability.

### 4.3 Demographic Profile of the Respondents

In this thesis, respondents were asked to indicate their age, sex, working experience, income level and number of years doing business (working) with this company. Their responses present on the following table accordingly.

Table 4.3: Demographic Profile of The Respondents

Sex			Age		
Category	Frequency	%	Category	Frequency	%
Female	122	40%	18-30	69	22%
Male	186	60%	31-45	125	41%
			46-60	87	28%
			Above 60	27	9%
Total	308	100%	Total	308	100%

Number of years doing business (working) with this company			Work Experience			Income		
Category	Frequency	%	Category	Frequency	%	Category	Frequency	%
Below 1 year	63	20%	1-5	98	32%	Below 5000	46	15%
2 Years	78	25%	6-10	135	44%	5001 – 10000	87	28%
3 Years	89	29%	11-15	38	12%	10001 – 15000	112	36%
4 Years	67	22%	16-20	22	7%	Above 15000	63	20%
Above 5 Years	11	4%	Above 20	15	5%			
Total	308	100%	Total	308	100%	Total	308	100%

Source: Own survey, 2018

The gender distribution of the respondents is presented in Table 4.2. In this thesis, the frequencies for male and female respondents are 186 and 122 respectively. The same table also presented the age of the respondents. Majority of the respondents were in the age range of 31 – 45 years. The objective of this question is to find out which age group

employees are satisfied with their job. Overall, the gender and age distribution of the respondents show that the respondents are in active age and with both female and male participation.

According to the above table, more than 29% of respondents have been working with the company for more than three years and 4% of the total respondents have been worked starting from the establishment of the company. Consequently, the participants have pertinent working experience as 44 % of them working more than two years. Similarly, more than 15% of respondents are below 5000 Birr income per month and 28% of the total respondents have a good income per month. It shows that the respondents have a good working experience, pertinent income and appropriate occupation and they are relevant to this thesis.

#### **4.4 Mapping Supply Chain Practice of Agmas Water**

Water in a plastic bottle might not be the most exciting product category, but sales of bottled water have registered nearly continuous growth for more than three decades. However, the implementation set of SCM practices differ depending on the country and type of organization involve. Due to this reason, a bottled water industry was selected as a case study as it has unique and different set of practices in implementing SCM. This is due to the fact it has different managerial perceptions of how supply chain components are related to each other and different style of management is implemented as bottled water sold in many sizes and formats, bottled in both glass and various types of plastic bottles. Agmas water was selected due to the fact that Agmas Springs is committed to doing business responsibly and seeking opportunities to make a difference. That means investing in its communities and the environment and focusing its efforts around meaningful issues with like-minded partners to enable positive change. Agmas Springs has been awarded by the Ethiopian Conformity and Assessment Authority for its high quality and Original Taste.

Given the massive demand for bottled water in Ethiopia, customers of Agmas water usually are represented by either individual, retailers, wholesalers, bars, restaurants,

shops, supermarkets, governmental institutions that are responsible for workshops, meetings, weddings, events, exhibitions or large firms which are seeking for additional room for housing their fast growing trade activities. In many cases, the orders of these customers are defined in detail through oral order and communications. The remainder of this paragraph addresses the case company's supply chain processes.

Table 4.4: Details about Agmas Company

Turnover	+/- 300 Million Birr per year
Number of employees	300 People (90 labors including daily laborer for loading and unloading)
Production capacity	300,000 (600ml) bottles per day
Markets	Addis Ababa and regions
Entities	Local PET, labels from china, water ground water,

Source: Own survey, 2018

Current situation (buyer and supplier relationships) – downstream/upstream – market study on demand analysis and supply situation with customer order and done and are processed until they are delivered to customers. The supply chain of the company can be typified as long lead times of raw materials in the local and china market. In most cases standard sizes of raw material in bottled industry are required, namely preform, cap and labels. It sounds easy doesn't it? Put some water in a bottle and sell it. But a look at the supply chain of Agmas water shows it is not nearly that simple and involves 25 KM of travel before it finds its way into the shops of downtown Addis Ababa. It involves shipping raw material across two continents and between four countries before being production to the Ethiopian and it worth an estimated Birr 400 million a year. It might be convenient to pop into a shop and buy some water, but it is far from convenient to organise the manufacture of the product and shipping of what makes up the plastic bottle.

Of course the major cost is making the plastic bottle to contain the water; it is estimated around 60% of the manufacturing cost. According to interview session, the Water Production takes three litres of water to make the packaging for one litre of bottled water, while it estimates that 40 million bottles are needed to produce for the Ethiopia market.

#### 4.4.1 Present Supply Chain Map of Agmas Water

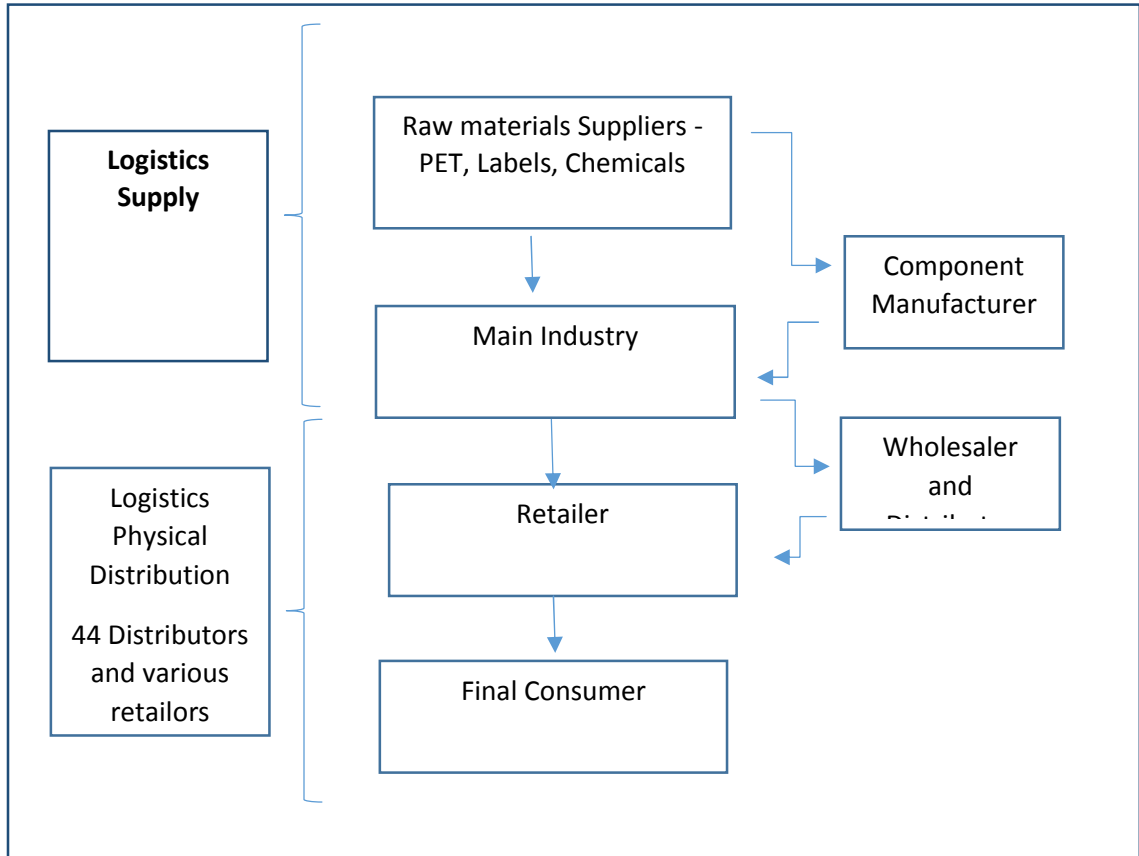


Figure 4:1 Present Supply Chain Process of Agmas Water

Agmas is sensitive in its production of water as water is a very sensitive product - on both microbiological and chemical levels. Strict production control is critical to avoid any contamination of pathogenic bacteria or protozoa. There are supplier of various goods and service to produce water, these companies provide the tools, technologies, and solutions Agmas needs to make its process safer and more efficient every step of the

way. Concerning bottled Water Processing Steps in Agmas, Water Filtration is done and it helps to purification the water. Water must be free of any contaminants that will spoil its quality, reduce its shelf life, and be a pathogenic threat to consumers. Second, Tank Venting and it includes the air in the storage tank will be free of microorganisms to ensure that the water stored will not be contaminated and then, carbonation is taken placed. Carbonation is the step of adding carbon dioxide to a drink. It is used to produce sparkling water. The CO<sub>2</sub> that you inject into your water must be free of particles and microorganisms. The fourth step is Bottle Blower and Bottle Washer ; it helps to maintain the quality of your drink and its shelf life, using a safe and reliable container is essential. The air used in the bottle blower to turn the pre-forms into the final PET bottle must be free of contaminants; its filtration ensures a bottle with low bioburden is produced. Bottle blowing is done during any process using PET bottles. The water used to rinse PET bottles must be free of contaminants; its filtration ensures good quality of the bottles prior to filling. Finally, Bottle Filler is the concluding phase and gas filtration can also be used during the filling process of carbonated drinks. For the filling to be possible, the filler bowl must be pressurized, and it is essential that the gas used is microbiologically stable.

One can imagine then that the corner store, depending upon its mix of products, could have several distributors. Agmas water has 44 distributors. That these distributors are, in turn, customers of bottlers of water, who are, in turn, customers of those who supply water, the plastic bottles and caps, and the labels that go on the bottles. Logistics is a channel of the supply chain which adds the value of time and place utility. Agmas water does not have any challenging transformation process, this mean the company follows and involves a relatively easy manufacturing process. Manufacturing phase is most impacted because of the energy required during the manufacturing phase which includes production of plastic bottles for water, product bottling (pumping, filling, treatments - if any). It does not end here, it also involves secondary packaging and storage until the product is out of the factory for delivery.

#### 4.4.2 Product lines



Figure 4:2 Products of Agmas

Agmas packaging's are done in a way so that it can target a wide range of consumer & business market. The target market is segmented in few sections:

General Consumer Market:

- 2 liter plastic pet Bottle
- 1.5 liter plastic pet Bottle
- 1 liter plastic pet Bottle
- 600 milliliter plastic pet Bottle

## 4.5 Analysis of the Responses

In this part, a selective descriptive statistic was used specifically counting and percentage. This part is selected to describe the missing data and to know more about the features of a collection of data. It's indicated these two parts of descriptive statistics were used to summarize the respondents' responses. Typically, this part is divided by nine subparts as strategic supplier partnership, customer relationship, quality information sharing, information sharing, internal operation practices, information technology, challenges/barriers for effective SCM implementation, SCM Supply chain collaboration and functional integration within a company. As it was briefly mentioned in the literature part of this thesis, the most common supply chain management practices were supplier and customer relationship, internal operation, information sharing, information technology and training. For each practice different items were developed and measured based on their mean and group mean values.

### 4.5.1 Strategic Supplier Partnership

In this thesis, participants were asked to rate their responses on using quality as number one criterion in selection of suppliers, solving regularly problems jointly with its suppliers, continuous improvement programs that include its key suppliers and actively involve our key suppliers in new product development processes.

Table 4.5: Respondents' response on strategic supplier partnership

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	SD	Mean
	1	2	3	4	5		
Considering quality as first criterion in selecting suppliers	10%	13%	8%	44%	25%	0.457	3.61
regularly solves problems jointly with its suppliers	10%	25%	18%	32%	15%	0.805	3.17
has continuous improvement that include its key suppliers	9%	19%	14%	40%	18%	0.998	3.39
actively involve our key suppliers in new product development processes	12%	18%	6%	49%	15%	0.87	3.37
<b>Grand Mean 3.38</b>							

The data show the mean of the four variables is between 3.17 and 3.61 and the standard deviation of these variables is between 0.457 and 0.803. It shows low variability among the responses. The thesis reveals strong agreement regarding taking quality as supplier selection (M= 3.61). The mean result of these four variables indicates that they are in the category of strongly agree. The overall mean value of suppliers' partnership relationship is 3.38 which is moderate with respect to the overall measures taken into consideration. These, mean values imply that the selected companies have moderate relationship with its supplier on considers quality as number one criterion in selection of suppliers, regularly solves problems jointly with its suppliers, continuous improvement and actively involve our key suppliers in new product development processes. In line to this analysis, Charles *et al.* (2014) and Li *et al.* (2006) state that customer relationships include the complete range of practices that are employed for building long- term relationships with customers & improving customer satisfaction. This thesis used a thesis of Pauline Mumbi Kamau, 2015, Supply Chain Planning and Performance of Water Bottling Companies In Nairobi City County, Kenya as benchmark. The Kenyan study found that the practices under integration with suppliers to a large extent includes the firm has improved efficiency in supply chain management with (m= 3.5263, std dev=.90483)). This shows that this practice adopted have improved the performance of the organization. With the use of SCM, enterprises can rationalize manufacturing processes across functional or organizational boundaries, and possess up-to-date production schedule of suppliers and avoid the bullwhip effect and finally promote the product and service quality (Yan and Cheng 2001).

#### **4.5.2 Customer Relationship (SCR)**

Regarding customer relationship, participants were requested to rate their opinion on – frequently determine future customer expectation, facilitate customers' ability to seek assistance, interact with customers to set reliability, responsiveness etc standards and measure and evaluate customer satisfaction.

Table 4.6: Respondents' response on customer relationship

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	SD	Mean	
	1	2	3	4	5			
frequently interact with customers to set standards	11%	33%	15%	21%	20%	0.651	3.06	
frequently evaluate customer satisfaction	9%	29%	18%	29%	15%	0.505	3.12	
customer expectations	10%	31%	14%	27%	18%	0.667	3.12	
facilitate customers' ability to seek assistance	15%	26%	6%	39%	14%	0.487	3.11	
<b>Grand Mean 3.10</b>								

Source: Own study (2018)

The above table indicates that all participants confidently disagree on frequently interact with customers to set standards. In this case of exception, 33 per cent of the respondents remain selected the category of disagree. The data shows the mean of the four variables is between 3.06 and 3.12 and the standard deviation of these variables is between 0.487 and 0.667. The thesis reveals agreement regarding the customer relationship (M= 3.10). This implies the case company is not meeting the full requirements of the customers as per their desire. On the other hand, customers are not fully satisfied in getting the amount of material they required. In order to experience successful relationship with customers and suppliers, there has to be a joint material planning. This is because, according to Paulraj (2004), coordinating operational activities through joint planning with suppliers and customers results in inventory reduction, smoothing production, improve product quality, reducing supply uncertainty and lead-time. The industry leaders increasingly build competencies to integrate with suppliers and customers and find that, these competencies lead them to supply chain excellence. Pauline (2015) showed that the grand mean value of customer relationship as better than this study (m= 3.25, SD=.750). This shows that this practice adopted have improved the performance of the organization.

### 4.5.3 Exchanging Quality Information

Regarding quality of information sharing, this thesis tried to know the participants opinion on - information to partners timely, exchange information to partners accurately, exchange complete information to partners and adequate information to partners.

Table 4.7: Respondents' response on Exchanging Quality Information

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	SD	Mean	
	1	2	3	4	5			
exchange information timely	9%	25%	14%	32%	20%	0.950	3.29	
exchange information accurately	7%	23%	19%	36%	15%	0.492	3.29	
exchange complete information	5%	21%	11%	49%	14%	0.775	3.46	
exchange adequate information	6%	19%	14%	41%	20%	0.815	3.50	
<b>Grand Mean 3.38</b>								

Source: Own study (2018)

The above table outlined majority of the respondents, 32% are in the category of strongly agree that indicates as exchange information to partners timely and 25 % decline it preferred disagree category. The data shows the mean of the four variables is between 3.29 and 3.50 and the standard deviation of these variables is between 0.492 and 0.950. The overall mean value of quality information sharing of the respondents' response is in the category of moderately agree. The variables have lesser standard deviation and it means there is no a high dispersed data. Therefore, organizations need to view their information as a strategic asset & ensure that it flows with minimum delay and distortion (Lee and Whang, 2000). According to Pauline (2015), on quality information, the findings as shown the experience of bottled water had quality information management incorporated in the study (Mean= 3.965). However, the finding of this thesis was lower than Kenyan experience. Quality of Information sharing includes such aspects as the accuracy, timeliness, adequacy, and credibility of information exchanged. While information sharing is important, the significance of its impact on SCM depends on what information is shared, when and how it is shared, and with whom. Information shared among chain members must be valid and update. This dimension is measured in

accordance with the structures including valid, on time, careful, enough and reliable (Li et. Al, 2006).

#### 4.5.4 Level of information sharing

The questionnaire was designed to know more about the participants opinion on information sharing about share delivery scheduling data with our most important suppliers, design and manufacturing data with most important suppliers, order, demand, and forecast information and inventory, production, sales information with our most important suppliers.

Table 4.8: Respondents’ response on Level of Information Sharing

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	SD	Mean	
	1	2	3	4	5			
shares data with suppliers	7%	30%	14%	32%	17%	0.765	3.22	
Demand, and forecast information	9%	29%	19%	36%	7%	0.355	3.03	
share information with most important suppliers	8%	49%	12%	21%	10%	0.625	2.76	
share scheduling data with suppliers	11%	25%	24%	30%	10%	0.355	3.03	
<b>Grand Mean 3.01</b>								

Source: Own study (2018)

According to the above table, almost more than 30 per cent preferred the category of disagree in all four constructs of information sharing that indicates poor performance exhibits on critical and proprietary information is communicated to one’s supply chain partner. The key to make supply chain effective and efficient is making available undistorted & up-to-date marketing data at every node within the supply chain. Half of the respondents disagree (not strongly disagree) that sharing inventory, production, sales information with most important suppliers is poor. The mean of the for variables is between 2.76 and 3.22 and the standard deviation of these variables is between 0.355 and 0.765. The overall mean value of demand fulfillment of the respondents’ response is moderate or in the category of disagree. Within information sharing level, Agmas water has been practicing lagging behind Kenyan experience (mean 3.5; Pauline (2015). The company has been taking the data available and sharing it with other parties of the supply

chain moderately. Information sharing is as one of five building blocks that characterize a solid supply chain relationship.

#### 4.5.5 Internal Operation Practices

About internal operation, the following items were included on the thesis. There are: shows regularly continuous and instantaneous product and service improvement, uses latest and flexibility production system and automated production process automation

Table 4.9: Respondents' response on Internal Operations Practices

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	SD	Mean	
	1	2	3	4	5			
Uses up to dated production	7%	48%	14%	14%	17%	0.747	2.86	
flexibility of production system	9%	49%	19%	16%	7%	0.653	2.63	
automated production process automation	8%	46%	12%	24%	10%	0.625	2.82	
continuous improvement	11%	31%	24%	24%	10%	0.723	2.91	
<b>Grand Mean 2.80</b>								

Source: Own study (2018)

Internal operation is the starting point to make the environment favorable for integration with the external partners. Tan and Wisner (2003) states that poor internal operations can lead to failure in coordinating with external partners. The mean value of respondents' reveals that Management Know-how regarding supply chain effectiveness is 2.80. It is moderate, but the internal operations are the most critical factor to measure organizations' potential to go for supply chain partners. According to Perry and Shoal, (2000) management know how about the orders and automated orders are the key enablers to realize the quick response program. On the other hand, up-to-datedness of service giving system and flexibility of service giving system to handle order patterns shows 2.86, and 2.63 respectively. Based on the overall analysis of the case company' internal operation practices the researcher concludes that it is moderate. However, this does not mean sufficient, because of the internal operations criticality for creating

integration or relationship with external participants or supply chain partners. Therefore, it implies that, the case company has an assignment to improve its internal operation to create effective relation with external partners.

#### 4.5.6 Information Technology

Regarding information technology, participants rated their opinion on use uninterrupted IT system, uses IT-based automated ordering system, uses up-to-datedness of IT technologies throughout the supply chain and has adequate IT systems throughout the supply chain.

Table 4.10: Respondents' response on Information Technology

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	SD	Mean	
	1	2	3	4	5			
Uses IT-based automated ordering system	10%	25%	11%	37%	17%	0.875	3.26	
Uses up-to-datedness of IT technologies throughout the supply chain	9%	40%	15%	25%	11%	0.505	2.89	
Has adequate IT systems throughout the supply chain	8%	40%	10%	30%	12%	0.595	2.98	
Use uninterrupted IT system	10%	35%	14%	30%	10%	0.535	2.92	
<b>Grand Mean 3.01</b>								

Source: Own study (2018)

Advance in information technology have given opportunities for organizations to transform the way they manage their business (Lee and Whang, 2001). Out of four items developed to see the extent of IT application in Agmas, surprisingly all the items scored the mean value approximate to 3.01. The adequacy of IT throughout the supply chain and the level of IT-based automated ordering from major customers represent mean value of 3.26. On the other hand, the mean value of Up-to-datedness of IT throughout the supply chain, IT-based automated ordering from major customers and IT-based automated ordering to major suppliers revealed that 2.89, 2.98 and 2.92 mean value respectively. Generally, the groups mean value of SCM practice from IT perspective is 2.45, which is

interpreted as there is moderate IT application practice across the company's supply chain.

#### 4.5.7 Challenges/ Barriers for effective SCM implementation

With the challenges/ Barriers for effective SCM implementation, information were gathered about faces supply uncertainty (supplier inability to carry out the promise), Trusts its partners to share confidential data and willing to share risks and benefits Faces inventory fluctuation due to inaccurate information sharing (bullwhip effect).

Table 4.11: Respondents' response on Challenges/ Barriers for effective SCM implementation

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	SD	Mean	
	1	2	3	4	5			
Faces supply uncertainty (inability to carry out the promise)	10%	37%	11%	35%	7%	0.535	2.92	
Trusts its partners to share confidential data	9%	44%	16%	21%	10%	0.405	2.79	
Willing to share risks and benefits	8%	41%	10%	29%	12%	0.575	2.96	
Faces inventory fluctuation due to inaccurate information sharing	10%	35%	12%	34%	9%	0.585	2.97	
<b>Grand Mean 2.91</b>								

Source: Own study (2018)

The part of the thesis focused challenges of SCM that consists of uncertainties, bullwhip effect as taken from on the conceptual framework adapted and developed for this thesis. As illustrated in the above table, out of four major items used to determine the extent of major challenges in supply chain management: trusts its partners to share confidential data shows the lowest mean value, which is 2.79. This implies that the participants in the SC of Agmas water is reluctant to share risks and benefits associated with their supply chain. All items scored moderate mean values. Accordingly, inventory fluctuation due to Bullwhip effect, and willing to share risks and benefits data represented mean value of 2.97 and 2.96 respectively. The result of institutional trust to share confidential data

shows moderate institutional trust in sharing confidential information and as it is good for those of SC partners. Whereas the mean value of inventory fluctuation due to bullwhip effect conveys that there is distorted and inaccurate information flow within the SC of the case company. This implies that there is a relationship between bullwhip-effect, information sharing and IT practices of SCM. Consequently, poor information sharing practice is resulted from poor IT which ultimately resulted in distorted information flows. In chapter 3, in the research design of this thesis, it was indicated that the qualitative study explicitly in-depth interviews of various people (including experts in supply chain) selected for their first-hand knowledge about supplier chain practices. The interviews are loosely structured, relying on a list of issues to be discussed. Key informant interviews in this study resemble a conversation among acquaintances, allowing a free flow of ideas and information. Key informant interviews are conducted because of it provides information directly from knowledgeable people; provide flexibility to explore new ideas and issues not anticipated during the planning and inexpensive and simple to conduct. All of the experts agree on that inventory management and order fulfillment provides more value to markets (customers) by inventing and producing solutions. They indicate this process may be based on the internet-based business-to-business selling and customer self-service. And techniques to improve contract pricing and sales promotion administration within information sharing strategies that include the use of electronic data capture, and electronic data interchange between trading partners with in techniques to automate product sourcing and payment settlement directly from sales order processing. The interviews show that supplier integration in terms of interaction and collaboration between their organization and the supplier with respect to various aspects and activities in lag to implement on trusting suppliers and have long term contracts and assisting suppliers to improve production, processes and fostering quality improvements. This may be due to the costs associated with such integration may potentially high. In addition, supplier integration includes several activities undertaken by the customer firm to develop supplier's capabilities and competencies. Such activities may include quality

improvement efforts, process improvement and redesign, technology change, and other investments aiming at developing.

#### **4.6 Interview Results**

As per the interview held with selected experts' reveals that in lead time reduction, there are problems resulted from both external internal factors. As their response the external factor is related with client and suppliers i.e., in the case of client, payment not paid in the specify period of time and in the case of supplier, some inputs are bought from abroad and it takes up to three months to reach to the company which may increase lead time.

Sometimes due to shortage of stock item, shortage of cash, breakdown of truck; the logistic section do not transport the required amount of materials to the customers. But, to minimize the delay of resulted from shortage of input materials as much as possible the case company has materials stock with in ware house which pushed inventory cost up. For the issues related with effectiveness and flexibility in meeting customers' requirement and required material accessibility, as supply manager's response shows the company create agreement for critical materials various material supply from the factory warehouse to industry site by their transport.

In the case of meeting customers' requirement, at the time of shortage in input materials the company gives priority to some major project site. For instance, on the shortage of gas oil, the company transfers the item from the main depot to project site /customers/. And the level of flexibility is an average. In the case of effectiveness in managing customers' complaints, at the very beginning the customers are part of company.

Most of the time the reason of complaints is the required material not delivered on time. If any complaints come from customers the company could manage it as its rationality.

With respect to compliant management, major customers replied as, the case company is not responding their complaints immediately, to solve this complain at least it took two weeks. Therefore, based on the above analysis of both quantitative and qualitative with different management bodies, and customers conveys that the company's orientation towards customers service is moderate. Availability of materials is essential for the

timely completion of activities and for the productivity of the labor force. If materials are not available when they are needed, a variety of problem might arise.

#### **4.7 Discussion of the Results**

This study result is similar to Moslem (2013) research on supply chain management practices in manufacturing companies of Khuzestan province (Iran) by using strategic partnerships with supplier, customer relationship, information sharing, quality of information sharing and internal lean practices as independent variables affecting the competitive advantage. The result from this thesis indicates as it is essential to enhance the SCM practices using these variables. Lenny *et al.* (2007) conducted study on of supply chain management practices on of SMEs in Turkey. It was found that SCM practices in two factors: outsourcing and multi-suppliers (OMS), and strategic collaboration and lean practices (SCLP). The results indicate that both factors of SCLP and OMS have significant importance on customer service and operational performance. On the research topic Supply Chain Management measurement and its influence on Operational Performance conducted by Priscila and Luiz, (2011), SCM measurements were considered as consists of information sharing, long term relations, cooperation and process integration as independent variables influences operational performance in case of Brazilian companies. The empirical results of this study provided evidence of a positive impact of SCM measurements on operational performance. Supply Chain Management, Product Quality and Business Performance in case of Malaysian manufacturing companies conducted by Arawati, (2011) and the study specifically investigates relationships between SCM, product quality and business performance and these associations are analyzed and the result demonstrates that SCM dimensions namely 'lean production', 'new- technology and innovation', 'strategic supplier partnership' and 'postponement concept' appear to be of primary importance and exhibit significant effects on product quality and business performance.

Not all suppliers can be considered as strategic supplier. Thus, strategic supplier relationship is characterized as the long-term relationship between its suppliers and the

organization. Kushwaha (2012) assured the purpose of strategic supplier partnership is to leverage on the strategic and operational capabilities of individual participating organization in achieving significant ongoing benefits. A strategic partnership stresses on cooperation of long-term association and inspires the joint understanding of efforts in problem solving solution. Furthermore, study by Tan (2005) also concluded that customer relationship management is crucial in SCM practices and further concluded that the customer and supplier relationship are the key SCM practices that will lead to organizational performance. Thus, customer relationship practices are very important and crucial to an organization as its affected the success of SCM and as a result, affected the organizational performance as like this thesis. Mentzer (2000) like this thesis mentioned that sharing information may be varied in nature especially customer information through the flow of information about logistic activities. Basically, information sharing involved information related to logistics, customer orders, forecasts, schedules, market and so on. Besides, information sharing is included the access of private data between trading partners so that they can follow up on the products status and the progress of the order through the supply chain system

Adebayo (2012) conducted study on SCM Practices in Nigeria Today: Impact on SCM Performance. This thesis provides empirical justification for five key dimensions of SCM practices identified and describes the relationship among SCM practices and SCM performance as well as the impact of these practices on SCM performance. Mahbulul (2013) conducted research on Effects of Supply Chain Management Practices on Customer Satisfaction in the pharmaceutical industry of Bangladesh: Evidence from Pharmaceutical Industry of Bangladesh. The results of the study indicate that SCM practices as observed in the industry comprise three dimensions, namely, collaboration and information sharing, logistics design and IT infrastructure, and organizational culture (OC). However, while the first two exert their impact on customer satisfaction, OC does not have any influence on it. On other hand, Juma and Qi Xu (2009) conducted a study on Supply Chain Management and challenges facing the Food Industry Sector in Tanzania. The complexities of food supply chain impose enormous challenges to the

processors. As compared to multinational food companies operating in Tanzania, local firms have been performing inefficiently or going out of the business because they could hardly withstand the competition. SCM in the food industry sector was studied in a qualitative survey covered 23 food processing firms in Tanzania, with the purposes of identifying the existing supply chain operation, knowledge of SCM concept and challenges facing the sector. The findings of this thesis suggest that a lot of efforts need to be addressed to ensure that food processors benefit from SCM concept. The understanding of SCM concept among the processors seems to be low, thus, hindering them from tapping up the advantages that SCM concept offer. The sector still faces a number of factors which impede the firms to grow fast and compete in the global market. In this regard, Agmas water does not show a unique moderate supply chain management practices as the understanding of SCM concept among the African processors seems to be low and exhibited delayed on consuming the advantages that SCM concept offer. This is because the concept of SCM in many developing countries including Ethiopia, Kenya, Tanzania and others reported by different researchers and academicians have been mainly focusing in agricultural products and related problems such as lack of appropriate information, post-harvest losses, lack of electricity among others. Eskola (2005) addressed the marketing of agricultural produces and SCM in Tanzania, analysis of the constraints for the development of banana industry in Indonesia and Australia is reported by Singgih and Wood (2004), trust and power dependence into an analysis of agribusiness supply chain is reported in Batt (2004). Akyoo (2005) described a supply chain structure of spices in Zanzibar. Most of these papers present the complexity supply chain of raw agricultural products. They addressed issues on product perishability, marketing structure, transportation, product quality, post-harvest losses among others. However, investigation into cognitive and affects of SCM concept in food processing industries have been surprisingly understudied making relevant literature in the sector to be limited. Cox and Chicksand, (2005) discussed the strength and weakness of lean management thinking in the food and farming supply chains. Based on a case study of red meat supply they argued that the adoption of lean practices internally may be appropriate

for all participants in the industry, but the inter-organizational aspects of lean may not be easy to apply in practices, nor appropriate, for many participants. For multiple retailers adoption of lean principles may lead to increasing profitability. On the other hand for the majority of participants, adopting lean principles may result in a high level of dependency on buyers and to low or declining levels of profitability. It is rooted as the food industry sector is vast and diversified, categorized by different segments such as fresh food industry, organic food industry, processed food industry and livestock food industry. Each segment need different supply chain strategies such as procurement and sourcing, inventory management, warehouse management, packaging and labeling system, and distribution management, thus, the uniqueness characteristics of food supply chain (Georgiadis et al. 2005).

# Chapter Five - Summary and Recommendation

## 5.1 Summary of Findings

Supply chain management practices most practiced by Agmas water bottling firms in Addis Ababa, Ethiopia was identified, amongst these strategic supplier and customer relationship, quality information sharing, level of information sharing and collaborative supply chain planning were ranked. Current supply chain practice in the water producing firm/ industry are performed on fragmented basic with unstructured communication and no clearly responsibilities between the parties involved. As indicated in the literature part, SCM have different benefits like to increase productivity, and competitive advantage, reduce inventory, cycle time and to increase customer satisfaction, market share and profit of firms. However, as depicted on the statement of the problem part, company is not achieving a corresponding improvement in their business performance due to failure to addresses the whole spectrum of SCM. Based on these facts, the analysis and interpretation of data findings was presented as follows:

- The overall mean value of suppliers' partnership relationship is 3.38 which is moderate indicates moderate relationship with its supplier on considers quality as number one criterion in selection of suppliers, regularly solves problems jointly with its suppliers, continuous improvement and actively involve our key suppliers in new product development processes. In addition, the mean of customer relationship is 3.10 which implies the case company is not meeting the full requirements of the customers as per their desire. On the other hand, customers are not fully satisfied in getting the amount of material they required. The overall mean value of quality information sharing of the respondents' response is in the category of moderately agree (M=3.38). The level of information sharing of Agmas water indicates poor performance exhibits on critical and proprietary information is communicated to one's supply chain partner. The key to make supply chain effective and efficient is making available partially undistorted & up-to-date marketing data at every node within the supply chain.

- Agmas water exhibits its starting point as to make the environment favorable for integration with the external partners. It shows moderate practices of internal operations and that can lead to failure in coordinating with external partners. Out of four items developed to see the extent of IT application in this company, surprisingly all the items scored the mean value approximate to 3.01. The adequacy of IT throughout the supply chain and the level of IT-based automated ordering from major customers represent mean value of 3.01. The extent of major challenges in supply chain management: trusts its partners to share confidential data shows the lowest mean value, which is 2.79.

## **5.2 Conclusions**

The supply chain is a network of organization that are involved, through upstream and downstream linkages, in the different process and activities that produce value of the form of products and service in the hands of the ultimate customer. Based on the results of this thesis obtained and summary of findings, it is concluded that Agmas water moderately orients towards modern SCM and lacks substantial indicators of an integrated, efficient and effective SCM. Within the quantitative analysis of the company's customer service, it is concluded that the company can't ensure customer satisfaction with respect to customer service. The investigator comes up with conclusion that the case company's orientation towards customer service is poor and SCM practices have direct impact on customers' service. The primary reason mentioned for poor level of customer service are its internal operations and challenges/barriers for effective SCM implementation and the company's ability(potential) to embark on external integration. In other words, its result is clearly reflected on customers not getting what they need when they need it, long lead time, and poor complaints management, poor integration with suppliers, not having effective flexible production system that could respond to the changing customer's preference. The result of this thesis suggests that a lot of efforts need to be addressed to ensure that processors benefits from the concept of SCM. The case company as food processors operates individually with moderately relationship with their downstream partners apart from sell-buy relationship. Each member within the network

seeks to optimize individual profit rather than the entire supply network. In the situation where coordination does not exist inefficient supply chain is inevitable this is why local companies or processors are less competitive.

### **5.3 Recommendation**

Based on the findings and conclusions reached, the following recommendations were forwarded to improve the Supply Chain Management of the case company. It identifies the specific supply chain management practices commonly adopted by water bottling firms in Agmas water.

- The company may integrate the internal operational units, so as to judge the SCM practice as an effective and value adding, the internal operation should be flexible in responding to changing market needs, which is expressed on the basis of agility principles and to bring about flexible, responsive and efficient production. This can be done first, by networking the functional units of the organization with appropriate. IT and integrated information system. Secondly, breaking functional silos to encourage coordination and interdependent work design accompanied with agile work force and a network of multiple organization and relationship to improve flexibility and responsiveness to client and customers' requirements.
- The current information technology practice of the case company is moderate . This indicates that the company moderately control over its business and stay behind to lead the competition. Thus, the case company should improve and invest on IT facilities to enhance information sharing both internally and externally. With the aid of modern technologies and Internet-based software, the company can simplify the supply process and dramatically reduce shipping errors.
- More importantly, Agmas water may improve its relationship with suppliers from simply buy-sale relationship to a modern supply chain relationship through establishing strategic or long-term relationship, contract, and continuous information sharing in order to minimize supply uncertainty which resulted in demand and supply unmatched and dissatisfaction of customers of the company. Because, this could help

to obtain the inputs at the right time and quantity from these suppliers and provide the required quantity by the customers when they need it. So that, this will minimize the dissatisfaction of customers due to shortage of materials.

- It may important to improve the relationship with customers through a continuous information sharing, follow-up them and get feedback, monitoring customers' perceptions towards service of the company, improving its compliant management through conducting market research for better responsiveness. Generally, all stake holders must work jointly, and the company making bench mark with other countries regarding the SCM practices. It should be noted that customers' needs to be given its deserved weight. In today's competition, firms with a superior ability to provide services that customers perceive as valuable incur an important competitive advantage. The food processors need to make commitments to learn what customers need and set strategies that implement customer friendly process relationship rather than the existing one buy-sell relationship. In most cases customers base their purchasing decisions on the service they receive, not just price, quality and availability of the product that provide superior customer service for the firm is very important.
- The company may need to review its supply chain management practices with a systematic management of the whole process of production lifecycle phases through the collaboration among different actors and all stakeholders.
- Lesson for other companies as food industry sector – they should collaborate with government institutions need to address seriously all of the challenges which are impeding the sector from catching up with the fast growing competitive market. Technology, professionalism, capital investment, managerial skills, and physical infrastructure are playing a major role in hindering the growth and contribution of the food industry sector towards the country's economic growth. Processors in collaboration with the government should work closely to developed good policies, strategies and operational planning which will enable the sector to exert its influence in the competitive global market.

#### **5.4 Directions for Future Studies**

The work in this thesis has covered a number of practices and problems in the SCM in bottled water industry, and there are still several research directions for the future work as the extension of the current study. A future development of the work in this thesis could be the incorporation of SM performance, effectiveness, and sustainability and efficiency issues on SCM of various bottled water industry in the country. The supply chain design problem can be considered simultaneously with the production and distribution planning problem as well. The decisions at different levels considered simultaneously will definitely benefit the overall performance of the supply chains considered. Others very important factors such as uncertainty, forward and backward integration, collaboration etc issues can also be considered in the production planning scheduling, global supply chain planning and water supply chain planning. The investigation of efficient solution procedures for tackling large-scale optimization models constitutes another valuable research direction.

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Appendices  
**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF COMMERCE**

Dear Respondent:

I am Alemayehu Tesfa a final year Master of Logistics and Supply Chain Management (MALSCM) student at School of Commerce, School of Graduate Studies, Addis Ababa University. I am conducting a research on my final thesis entitled “Assessing Bottled Water Supply Chain Management Practices: The Case of Agmas Water”.

The purpose of this thesis is to investigate the practices of the supply chain management of Agmas Water Factor. Your ideas and information are crucial for this thesis and for the improvement of supply chain management in producing quality products at reasonable price. Supply chain management is getting higher attention by different firms since it is used by different firms as one of the core competencies. So, this discussion mainly focuses on the supply chain management practices of your company. The information you are giving will be used for the partial fulfillment for the master’s thesis. Your participation is totally voluntarily and you can refuse at any time if you are not convinced to continue. Our university has a research ethical policy and you can report any complaints to postgraduate studies, School of Commerce, Addis Ababa University, if you are not pleased with the way this thesis is being conducted.

**Thank you for your cooperation.**

Sincerely,

**Part One – In relation to personal information, please tick X in the space provided**

- |  |               |                               |              |               |
|--|---------------|-------------------------------|--------------|---------------|
| 1. Age   | 18-30         | 31-40                         | 41- 50       | 51- 60        |
|  | Above 60      |                               |              |               |
| 2. Sex   | Male          | Female                        |              |               |
| 3. Number of years doing business (working) with this company? | Below 1 year  | 2years                        | 3 years      | 4 years       |
|  | Above 5 years |                               |              |               |
| 4. Working experience (total number of years)?                 | Below 1 year  | 2years                        | 3 years      | 4 years       |
|  | Above 5 years |                               |              |               |
| 5. Monthly Income  | Below 3000    | 3001 – 5000                   | 5001 – 10000 | 10001 – 15000 |
|  | Above 15000   |                               |              |               |
| 6. Educational background                                      | <10 grade     | High School and 10+2 complete | Diploma      | Degree        |
|  | MA and above  |                               |              |               |

**Part Two – You are requested to tick one of the five alternatives that can represent your rating on supply chain management practices of Agmas water.**

Question 1: Please express your degree of agreement with respect to Strategic supplier partnership Indicated through the following statements. Agmas Water

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	considers quality as number one criterion in selection of suppliers					
2.	regularly solves problems jointly with its suppliers					
3.	has continuous improvement programs that include its key suppliers					
4.	actively involve our key suppliers in new product development processes					

Question 2: Please indicate your agreement pertaining to Customer relationship based on the following statements. Agmas Water

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	frequently interact with customers to set reliability, responsiveness etc standards					
2.	frequently measure and evaluate customer satisfaction					
3.	frequently determine future customer expectations					
4.	facilitate customers' ability to seek assistance					

**Question 3: Please indicate your rate of Quality information sharing in terms of the following factors? Agmas Water**

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	exchange information to partners timely					
2.	exchange information to partners accurately					
3.	exchange complete information to partners					
4.	exchange adequate information to partners					

Question 4: To what extent do you agree/disagree regarding level of information sharing Agmas water? Agmas Water

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	often shares design and manufacturing data with most important suppliers					
2.	often shares order, demand, and forecast information					
3.	often share inventory, production, sales information with our most important suppliers					
4.	often share delivery scheduling data with our most important suppliers					

Question 5: Please indicate your rate of **Internal Operation Practices** in terms of the following? Agmas Water

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Uses up- to- datedness of production					
2.	Has flexibility of production system					
3.	Uses automated production process automation					
4.	Shows regularly continuous and instantaneous product and service improvement					

Question 6: Please rate of **Information technology** in terms of the following factors? Agmas Water

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Uses IT-based automated ordering system					
2.	Uses up-to-datedness of IT technologies throughout the supply chain					
3.	Has adequate IT systems throughout the supply chain					
4.	Use uninterrupted IT system					

Question 7: How do you perceive and rate **Challenges/ Barriers for effective SCM implementation**? Please encircle the number with the answer you choose. Agmas Water

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Faces supply uncertainty (supplier inability to carry out the promise)					
2.	Trusts its partners to share confidential data					
3.	Willing to share risks and benefits					
4.	Faces inventory fluctuation due to inaccurate information sharing (bullwhip effect)					

**Thank you again for your cooperation!**

## Interview Checklist

### **ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE**

#### **Interview Checklist for staffs**

1. How can you explain the overall supply chain management practices of the company?
2. How do you select the supplier of raw materials for manufacturing bottled water?
3. How do you measure the utilization of the production capacity of the available machines?
4. What are the major factors the decreases the utilization of the capacity of production in the company?
5. What are the inventory management across bottled water supply chain?
6. Do you have backward integration to suppliers and forward integration to distributors or wholesalers as a long term strategically?
7. Do you have an experience sharing best experiences in the area of supply chain management from benchmark bottled water companies?
8. What are the supply chain management problem faced so far with suppliers and distributors?
9. What are the recommendations or possible solution to solve such challenges raised so far?

#### **Interview Checklist for Customers**

1. How would you see your relationship with Agmas' Water factory?
2. Does the company provide the quantity you need at the promised date?
3. How do you see information sharing practice between you/your company with company?
4. How would you see the company's compliant management and its effectiveness?
5. What about the willingness to share risks and benefits with the company?