CHALLENGES OF SUPPLY CHAIN MANAGEMENT AND THEIR RELATIONSHIP WITH THE COMPETITIVE POSITION OF CEMENT INDUSTRIES IN ETHIOPIA

RESEARCH REPORT

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TO SUBMIT [SUBJECT TO CHANGES ALREADY COMMUNICATED] HIS FINAL RESEARCH REPORT

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DECEMBER 30, 2011

DECLARATION

"I declare that the **CHALLENGES OF SUPPLY CHAIN MANAGEMENT AND THEIR RELATIONSHIP WITH THE COMPETITIVE POSITION OF CEMENT INDUSTRIES IN ETHIOPIA** is my original work, that all the source I have used or quoted have been indicated and acknowledged as complete references, and that it has not been submitted for degree purposes previously"

Belay Mengistu Demisse   **December, 2011**

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Signature

ACKNOWLEDGMENT

ABSTRACT

Global Supply Chain Forum (GSCF) defined Supply Chain Management (SCM) as an integration of activities from the customer through the source where in the process to provide products and services as well as information that add value for the customers other stakeholders (Lambert and Cooper, 2000). As a management tool, SCM would strive to scan the environment, plan along with forward and backward stakeholders, design proper strategies to lower costs, shorten delivery time, low inventory level and improve reliability, where all intended to improve the competitive position of supply chain team members. Cement Industry in Ethiopia is an emerging industry where only few pioneers were regulating the market. The complacent conditions have led them to be driven by transactional suppliers relationships, not that much customer focused, energy sources and environmental issues were not to the level required and information communications infrastructures and linkages were not that much developed. However, this oligopoly nature of the market is starting to vanish soon as a lot of national and multinational firms are appearing into the market. Accordingly, this report would identify the level of perception of organization on the general issues of supply chain management, mainly suppliers partnership, customer relationship, environmental issues and information communication; analyze their level of impacts and relationships on the competitive position of Cement Factories in Ethiopia.

Key Words: Supply chain, Supply chain management, Competitive position, Ethiopian Cement Industry

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CSA	Central Statistics Agency
EC	Ethiopian Calendar
FDRE	Federal Democratic Republic of Ethiopia
GDP	Gross Domestic Product
GSRF	Global Supply Chain Forum
IT	Information Technology
JIT	Just in Time
MOFED	Ministry of Finance and Economic Development
R&D	Research and Development
SC	Supply Chain
SCM	Supply Chain Management
SSA	Sub Saharan Africa
SWOT	Strength, Weakness, Opportunities
US	United States

CHAPTER ONE

BACKGROUND of THE STUDY

1. Statement of the problem

Cement is produced from raw materials such as: lime stone, shell, clay in a continuous process. These raw materials are crushed into pieces, heated at a temperature of more than $1000^{o}c$ in a rotating kiln to produce clinker. Then the clinker is mixed with gypsum and grounded to a fine powder to produce cement. Cement is the main ingredient for the construction industry (Lasserre, 2007). Virtually buildings and constructions are impossible without cement. This implies that cement is important material in the construction industry. (Selim and Salem, 2010).

Cement is a homogenous product where cost differentiation is the main strategic issue to secure competitive advantage in the market. Cement prices are somewhat price inelastic. Though, at times when the private companies may decrease consumptions, governments never stop buying cement to practically affect their infrastructural investments (Selim & Salem, 2010).

Cost minimization could be attained in maximizing the scales of economies in the process of production and conserving the type and level of energy consumption which accounts the major cost component in the industry. As it is indicated in table 3 of the literature review, on average cement plants are

performing at 75% of their working capacity. The Central Statistics Agency (2009) identifies 80.5% of the reason for low capacity utilization in the manufacturing industry goes to the problem of electricity and water. Economist Intelligence Unit – Ethiopia Country Report (2011) indicates that the Ethiopian Government has reached electricity production capacity of 2000MW with a local access of only 41% of the population. It added that there are frequent power cuts due to the level of poor infrastructure. For this reason, most factories in Ethiopia are forced to use fossil fuels in the process of their calcinations where it is costly. In addition, it is not environmentally friendly due to the fact that it accelerates global warming. It is known that 5% of carbon emission is caused by cement production. (Loreti, 2009).

When demand exceeds, supply firms or by in large the government, may be involved in quota distribution to optimize the distribution and create price stability (Rensburg and Niekerk, 2010). Customers are supposed to wait to the long queue before they get the cements. This has two effects in the market. The first is that it would create producers complacency as they could sell their products at wished prices leading them to be not as such customer focused. The second issue is on the customer side where they feel so much dissatisfied on the current non availability and where the possibility comes, they would switch to the new entrants due to the prior developed hatred.

As defined by Heizer and Render (2007), "Supply chain management is the integration of the activities that procure materials and services, transform them

into intermediate goods and final products and deliver them to the customers". Fawcett, Ellram and Ogden (2007) indicated that the nature of competition has changed in that competitions coming to be among different supply chains as it is helpful to leverage the strength of the suppliers and customers to gain the competitive edge. This shows that the satisfaction of the customer is given a due consideration and the process requires well aligned and integrated partnership with suppliers and other members of the supply chain members. Internal functionality walls need to be demolished and everyone works together as a process team to serve the best interest of the ultimate customer.

The researcher hardly finds enough literature on the current supply chain practice in the Ethiopian Cement Industry. However, from the country's experience in the area of procurement, logistics and distribution management, the researcher generally describes the current practice of the supplier customer relation based on transactional basis instead of strategic alliances. The most accustomed and taken as transparent way of procurement is bid to purchase. Though this may enable to secure least price bid, it may not guarantee sustained lower cost, inventory, short delivery time, share appropriate feedbacks and improved reliability.

Because of the current imbalance of demand and supply, customers are not given due consideration and have to keep for their waiting list to come from a long queue.

Internally, most firms are organized functionally, not integrated as a flow of processes. As described by Hoole (2005), most of the people wear the hut of functionality. This leads to the lack of common thought of an integrated approach within and across organizations.

Marquez (2010) discussed information sharing is important in the supply chain net works. It would enable them to be fast and responsive to the market and makes demand change with lower costs. Sharing critical information is vital to reduce the level of inventory and costs while delivering improved performance level within the supply chain levels. He also reiterated that, unless and otherwise the flow of information is both effective and efficient, lack of trust and bullwhip effect would appear into the system. The information technology and connectivity in Ethiopia is not yet as such developed. Mulat and Tadesse (2002), in the survey they survey found out that the number of internet subscribers were only 6487, the number of subscribers per 1000 people in Addis Ababa, for other towns and for the country as a whole were 2.4, 0.24 and 0.1, respectively.

Due to the lucrative profits gained currently in the industry, visible demand and supply gaps in the coming years and government's relentless effort to attract local and global firms, the oligopoly nature of competition would not last in a sustained manner. World leading cement manufacturer like Lafarge and the African giant cement producer, Dangotte have already secured land for quarry and plant erection. They would bring their accumulated capital, technology and

the knowledge that they accumulated in the global market. As today is the era of globalization, other multinationals would also join the current market in Ethiopia.

Therefore, this research would like to address what the supply chain management challenges are and their impact on the future competitiveness in Ethiopia Cement Industry. Sub problems are:

- What is the relationship between strategic suppliers' partnership and competitive position of the cement industry in Ethiopia?

- What is the relationship between customer relationships and competitive position of Ethiopian cement industry?

- What is the relationship between environmental issues and competitive position of cement industry in Ethiopia?

- What is the relationship between information communication and competitive position of the Ethiopian Cement industry?

2. Research Objectives

The research has the following objectives.

- To make an awareness of the concept of supply chain management in the Ethiopian Cement Industry

- To make an awareness of the future challenges of the Ethiopian Cement industry in their competitive positions within the era of globalization

- To promote the concept and application of supply chain management concept as a mechanism to deal with the competitiveness challenges in the Ethiopian Cement Industry

- To analyze the current challenges in the supply chain management process and recommend solutions based on the findings.

3. Research Hypothesis

As defined by Leedy and Ormrod (2010), "a hypothesis is a logical supposition, reasonable guess, an educated conjecture." The research hypotheses are tentative propositions identified to guide the investigation of the problem/sub problems. They also mentioned that because we never really prove the hypotheses, null hypothesis is formed that takes there will no differences between groups, no consistent relationships between variables or no patterns in the data. It is often symbolized as H_o. The other opposite of this null hypothesis is called alternative hypothesis and is symbolized as H_a. Therefore the followings null hypotheses and alternative hypothesis are developed for the corresponding sub problems of the research as identified above.

H_{o1} : There is no relationship between the strategic suppliers partnership and competitive positioning in Ethiopian Cement Industry.

H_{a1} : There is relationship between the strategic suppliers partnership and competitive positioning in Ethiopian Cement Industry.

H_{o2} : There is no relationship between managing environmental issues and competitive positioning in Ethiopian Cement Industry.

H_{a2} : There is relationship between managing environmental issues and competitive positioning in Ethiopian Cement Industry.

H_{o3} : There is no relationship between effective information communication and competitive positioning in Ethiopian Cement Industry.

H_{a3} : There is relationship between effective communication system and competitive positioning in Ethiopian Cement Industry.

H_{o4} : There is no relationship between effective customer services and competitive positioning in Ethiopian Cement Industry.

H_{a4} : There is relationship between effective customer services and competitive positioning in Ethiopian Cement Industry.

4. Scope of the study

Supply chain management challenges and competitive positioning are vast issues to be addressed in this research. However, this piece of work would like to address those issues that are critical to break the deaf ear given to the supply chain management challenges and their impact on the coming competitive position of cement industries in Ethiopia. Therefore, this study is limited to those problems that arise in the process of complex interactions among different members in the supply chain of cement industry.

Like what is now the multinational companies are doing in the production and supplying cement, aggregate, concrete and gypsum (Lafarge, 2009), this research is limited only to cement production supply chain management on companies that are established and currently producing in the Ethiopian market.

Different Cement companies have been coming into the production and distribution of cement in the Ethiopian market. There are also companies that are found at a project phase. In order to see the supply chain process that starts from the extraction of the raw materials to the delivery of cement to the final users, it is important to limit with those plants that started production and have been working in the market for at least one year. This enables one to see and analyze the flow on somewhat equal basis among different established firms.

5. Significance of the study

First and foremost this study adds a well understanding of the supply chain management concepts and future challenges that may soon come in the oligopoly structured of the Ethiopian cement market. Globalization makes capital, knowledge, and skill to flow from every corner of the world and swallow the current complacent market. Angered customers could switch to competitors unless from the very beginning given proper services. Suppliers have to be considered as strategic partners of the business as they could leverage their resources, experience and knowledge in the era of competing one supply chain

members against others. Internal process flow integration aligned with the backward and forward partners are the focal point of discussion in this study.

Furthermore, this study would serve as an input and basis for other researches and scholars such as: academicians, policy makers, consultants and some associations who conduct further researches on related fields.

6. Conceptual frame work of the research

Issues/challenges in supply chain management, as listed by Fawcett et al 2007, are poor coordination of effort, incompatible information systems, long cycle times, communication problems, customer service issues, excessive waste and environmental degradation, relatively high inventory for the level of customer service achieved and lower than optimal profits. On the other hand Chandra and Grabis (2007) have identified supply chain issues and related problems as distribution network configuration, inventory control, supply contract, distribution strategies, supply chain integration and strategic partnering, outsourcing and procurement strategies, information technology and decision support systems (DSS) and customer value. They also categorized these problems into general and specific problems. The specific problems are those that deal with one particular issue like inventory management, production, maintenance, procurement etc… while the general problems are problems that cross multiple specific problems. For example, information communication involves all members from the customers back to the other end suppliers.

For this particular research, the researcher would identify the general problems that have an impact on the future competitiveness of cement firms Ethiopia. These are partnership with the suppliers, information communication, managing the environmental issues and customer relationship issues. As described above, these problems cross other multiple specific problems and cross multiple supply chain processes. For example, information communication crosses various processes related to demand management, transportation, inventory control, procurement, energy and environmental issues and so on.

Figure 1: Research framework
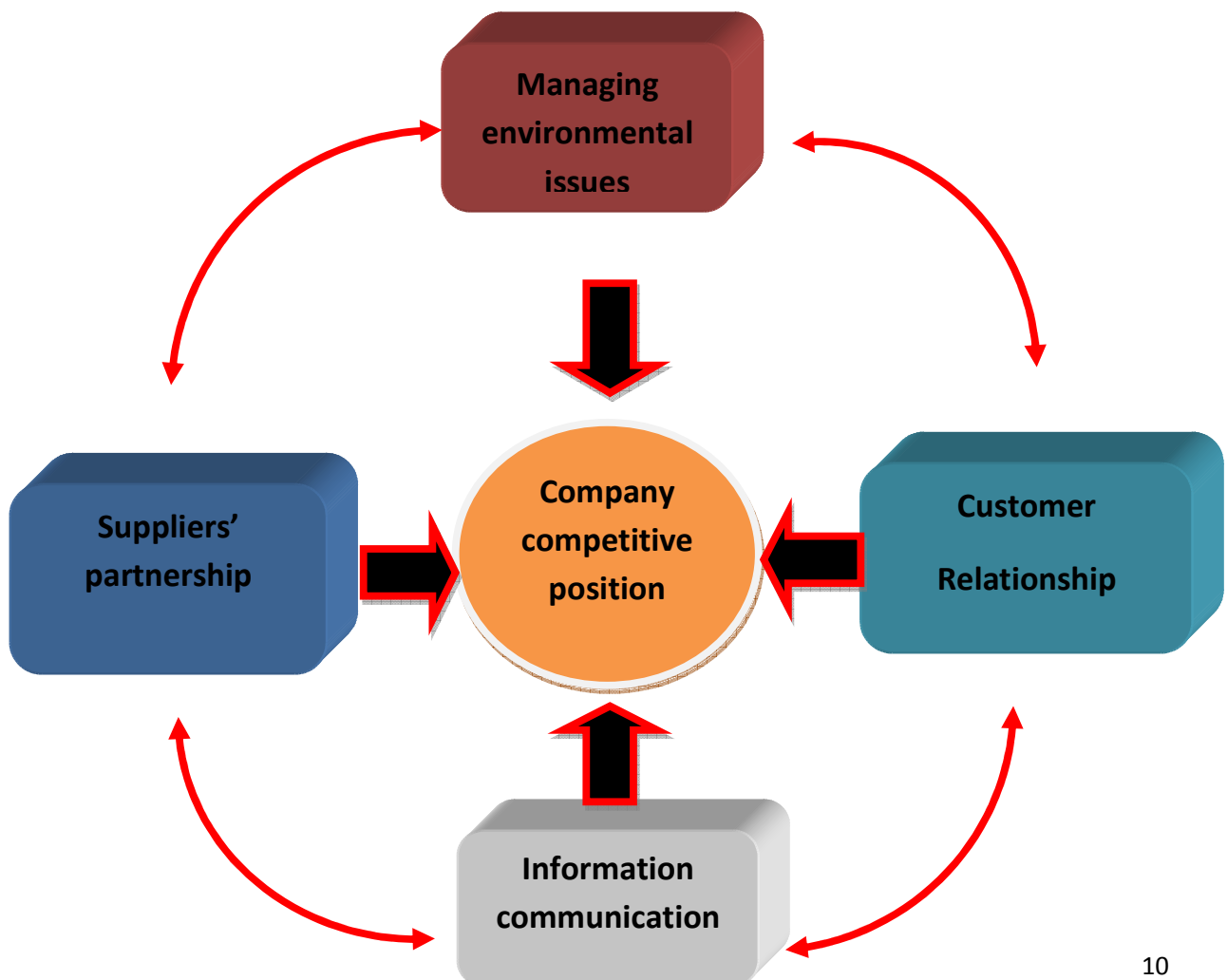
CHAPTER TWO

LITRATURE REVIEW

1. Fundamentals of Supply Chain Management

The terms supplier and customer have been in use since the start of commerce. However, the concept of supply chain began to appear in the late 1950 after Jay Forrester and his colleagues from Massachusetts, Institute of Technology, began to study the relationship between the suppliers and customers and where they identify what causes what later known as bullwhip effect. From functional approach of managing units, the process oriented term of supply chain management was also discussed by Keith Oliver in the year 1982. Following this, the value chain processes were identified by Micheal Porter in the year 1985 (Blanchard, 2010).

Though the supply chain management concept has appeared in the early 1980's, the process was somewhat uncoordinated. This is manifested in its long lead-times, its inclusion with functional silos, and absence of synchronization and coordinated, ending with excessive inventory and higher production costs. With the development of lean supply chain concept in the 1990's, JIT was implemented where suppliers were integrated into the supply chain and it was made possible to remove wastages though it was not as expected. These days the global planning system has been integrated among the supply chain members enabling them to think and act as a team (Childerhouse and Towill, 2000).

Supply chain management is defined by different practitioners and researchers depending on the background where they come from. Generally, the following definitions can be used as a working definition of supply chain and supply chain management.

Blanchard (2010) defines supply chain as the sequence of events that cover a product's entire life cycle, from the conception to consumption. These days companies are not only competing as autonomous entities instead they entered into an era of competing among different supply chains, leading them to work as a team in the formed network of business relationship (Lambert and Cooper, 2000).

These integrated and multiple relationships require the proper management and bring the essence of supply chain management. Lambert and Cooper (2000) use the definition of Supply Chain Management (SCM) as forwarded by the Global Supply Chain Forum (GSCF) as: "SCM is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders."

Fawcett, Ellram and Ogden (2007) use the definition given by Institute of Supply Management as, "Supply Chain Management is the design and management of seamless value - added processes across organizational boundaries to meet the real needs of the end customer."

Basically all of the scholars want to show level of effort, commitment and integration of the processes starting from the source of the materials up to the

delivery of goods and services to the customers in such a way that it adds more value in the whole processes and meet the level of consumers' satisfaction.

1.1 SCM in a Competitive Environment

Firms must generate revenue to grow, if not to survive. Revenue is generated through the process of availing products and services to the customers. Customers only buy if they are well convinced enough that the product or services will add value and satisfy them. Otherwise they would opt to look for other alternatives (Childerhouse and Towill, 2000). Due to the era of globalization and development of efficient information and transportation technology, both customers and competitors are well informed and capable of choosing what to consume, where source is, where to locate facilities, what to perform and what to outsource etc (Hill, 2009).

No firm can work in a closed environment. It receives and gives inputs and outputs with its external immediate and macro environment. Thompson, Strickland and Gamble (2008) identify immediate industry and competitive environment as its suppliers, buyers, rival firms, new entrants and substitute products. On the other hand they also identified the macro environment to be general economic conditions, legislation and regulations, population demographics, societal values and lifestyles and technology.

These are the criteria used by a company in assessing its strength and weakness as well as its opportunities and threats from within and from its external environment. Weaknesses are sorted out and solved; strengths are

more exploited and maximized. In the mean time, opportunities are exploited and threats are managed through suitable strategies to change them into opportunities. By scanning it's immediate and macro environment, a company develops various dependable strategies in order to come out competitively in a given environment. Competitive pressures are most usually analyzed using Porter's five forces model of competition as graphically shown below.

Figure 2: The five – forces model of competition
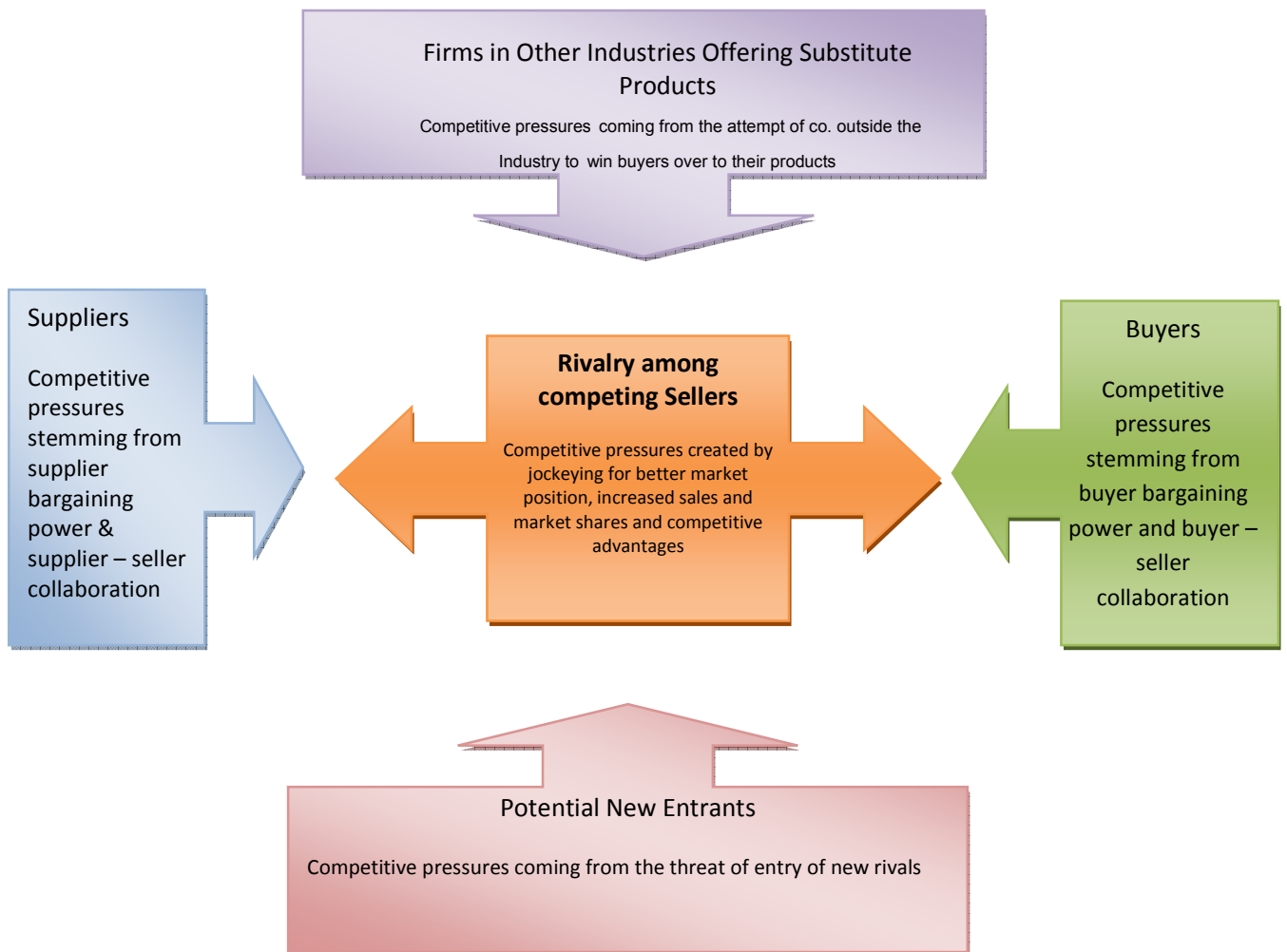
Source: Thompson et al, 2008 as adopted from Micheal E. Porter

Accordingly the strength, weakness, opportunities and treats (SWOT) matrix is prepared for every entity under consideration. Key success factors are identified and weaknesses are sorted to come out as a winner of the competition, as could be seen in the market share with improved market position and sustained competitive advantages.

As a management tool, SCM would strive for scanning the environment, plan along with the forward and backward stakeholders, design proper strategies that would enable the team to win sustained competitive advantages over their counterpart rivals. As cited in Lee and Kwon (2007), improvement in management of supply chain would result in lowering costs, short delivery time, low inventory level and improve reliability in which all improve the competitive position of the organization.

1.2 Objectives and benefits of SCM

The objective of supply chain management is to satisfy the requirement of the end customer (Childerhouse and Towill, 2000). Customers could be satisfied if they are mainly be a part and parcel of the system that delivers the product and services, giving direct input regarding their expectation (Fawcett et al,2007). As the essence of supply chain management is a pull system and starts from the customer, the role and involvement level would lead in the end to the satisfaction of the customers.

Customer focus delivers customer satisfaction and builds customer loyalty. If firms are customer focused, they will understand their key competitors well and the corresponding competitive forces. Moreover, they monitor and understand their level of pricing, product quality, product availability, and service quality and customer satisfaction. Higher level of customer satisfaction leads to higher level of customer loyalty, high level of revenue and market share and in the end it drive to high level of profitability (Best, 2009).

These days, customers are demanding enough due to the level of the awareness created. They expect for lower prices, better quality, shorter lead times on deliveries and increased reliability (Verwaal & Hesselmans, 2004).

In addition, they are continuously seeking for lower prices and compare things with the level of technology the world availed for them. The situation created by globalization may give opportunity for multinationals to supply products at their vicinity gates by sourcing from countries that are identified as low cost of production. Quality can be seen as a conformance to the specification. But this confirmation shall be clear enough to be easily understood and found to the level of customer's expectations. Prices and quality are not the only ones that determine the level of customer satisfaction. Innovation, timely delivery and service availability are the major requirements on the customer side (Fawcett et al, 2007).

CSPMP 2006 as cited by Salem (2011) indicated that supply chain management integrates supply and demand management within and across companies. Information exchanges and upward and forward linkage among the supply chain members would result in effectiveness and are manifested in lowered costs, reduced lead times, bullwhip effects and shortened delivery time. Costs would be lowered as the reliability in the delivery system improves. This could be improved by implementing e–ordering systems which facilitates access to information and connectivity. Fast and easy ordering as well as the user friendly inventory systems would determine the level of the reliability of the supply chain management performance level (Lee et al, 2007).

The interactive and collaborative nature of the contemporary supply chain management would enable members to view strategically beyond their organization. These enable them to achieve higher performance and enhanced customer satisfaction. Both understand that the process would deliver innovative, flexible and timely delivered product and services to the customers where all these efforts would help them to develop competitive advantages over their counterpart rivals (Kumar, Fantazy, Kumar & Boyle, 2006).

The interaction among the members of the supply chain would enable them proactively anticipate to changes that would enable them to seek a new emerging opportunity (Ismail and Sharifi, 2006). Working as a team at each level in the chain would sense, exchange and leverage the resources and skills

available to develop a winning strategy that would put them at a competitive position.

Swink, Golech and Richardson (2010) undertook a research on whether supply chain excellence really payoff or not. They identified top supply chain management companies basing different sources. From the operational performance perspective, these top supply chain management companies do have low R&D expenses, working capital, transaction costs and asset/employee ratio. In terms of financial and stock performance indicators, they do also have significantly better ROS, dramatic difference in ROA & ROE, better economic profit, significantly higher average monthly stock return and more market value/assets.

Generally an effective and coordinated supply chain management enables companies to lower inventory level, delivery lead times and costs. It also enables them to provide goods and services in a good and reliable quality. As integration and coordination among the member of the supply chain is strategically seen to serve the end consumer better, they would be in a position to proactively strive for changes and innovation where at the end of the day, both would be involved in a position to secure a customer satisfaction.

1.3 Supply Chain Business Processes.

Every process has got a beginning and an end. It receives input, processes it and finally delivers output to the environment. Every supply chain system has got its own processes.

In his popular book called "Competitive Advantage", Micheal Porter identifies the five primary processes up on which supply chain framework are built. These are: inbound logistics, operations, outbound logistics and sales and marketing. The inbound logistics refers to the availing of materials to the operations like activities of material handling, warehousing of materials, inventory control, transportations and handling of returns to the suppliers. Operation is where the inputs are processed into output and includes all activities related to manufacturing, packaging, assembly, equipment maintenance, testing and the like. Outbound logistics is the collection, storing and physical distribution of the products to the buyers. Sales and marketing refers to the activities that are related to the convincing of the buyers to buy products and services (Blanchard, 2010).

Citing Cooper et al. (1997), Mills, Schmitz and Frizelle (2004) have listed the following business processes within supply chain management.

A. Customer Relationship Management Process– under this process key customers are identified, the level of performances are specified, works are done closely with customers to eliminate the source of demand variability

and service level and accordingly are evaluated to confirm the level of as delivered to the customers.

B. Customer Service Management Process– Shipping dates and product availability information would be availed. Moreover, customers would be assisted in the application of the product.

C. Demands Management Process – the level of customer order is variable due to various reasons. Therefore, it is a process that balances the customer's requirement with the firm's supply capabilities.

D. Order Fulfillment Process – through an integrated effort of manufacturing, distribution and transportation, SCM works towards achieving high level of order fill rate to meet the customer need dates.

E. Manufacturing Flow Management Process – due to the nature of pull system in SCM, the process must be flexible enough to respond to the market changes. It is minimal lot size production as supported with mechanisms like just in time (JIT).

F. Procurement Process _ suppliers would be categorized depending on their level of criticality and contribution, in order to identify small core group of suppliers. Accordingly, they would be communicated with available IT communication systems.

G. Product Development and Commercialization Process – integrating customers and suppliers in the phase of product development reduces the

time it takes the product to the market. Working together with customer relations management clearly identifies the untapped customer needs. Procurement's involvement is important here as it helps to select materials and suppliers. Finally, it would develop the necessary manufacturing technology to manufacture as per the designed level.

H. Return Process – defective, damaged, scraps and wastes have to be returned back to their designated places for an economic and environmental reasons.

Figure 3: Intercompany business process links
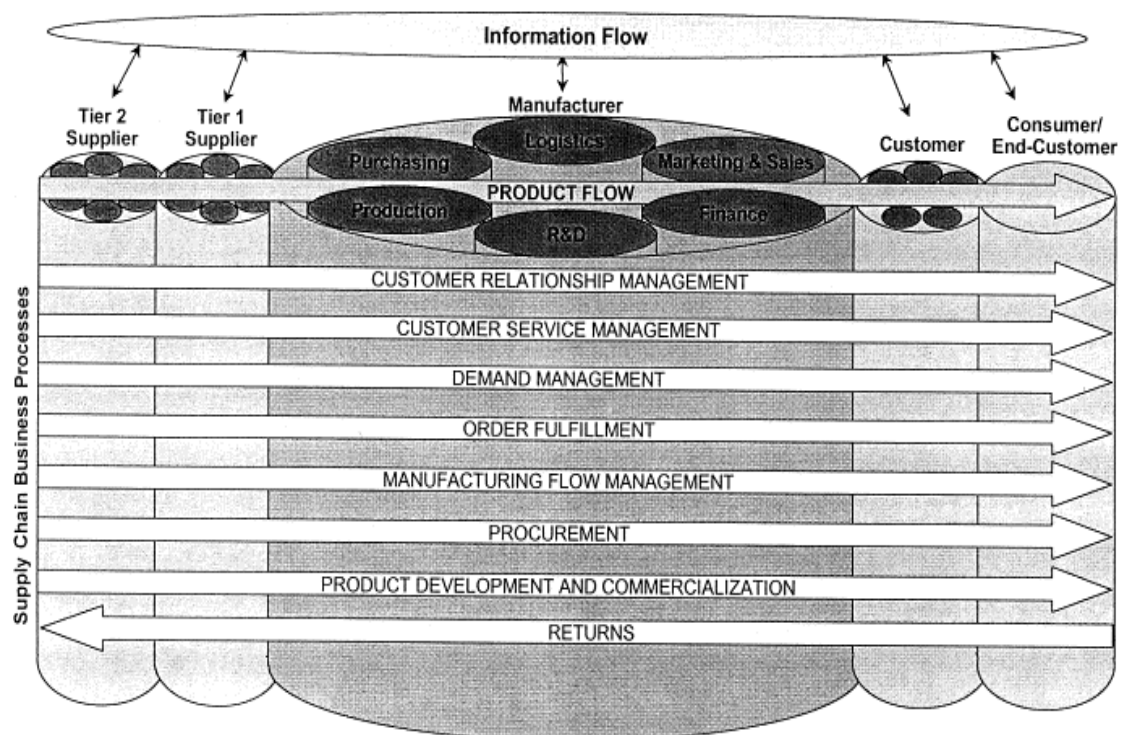
Source: *Lambert and Cooper, 2000 (as cited from Lambert, Cooper and Pagh, 1998)*

A consultant called PRTR and Advanced Manufacturing Research (AMR) along with other leading US and multinational firms formed Chain Council (SCC) in the year 1996. This council has developed a Supply Chain Operations Reference (SCORE) model (Stewart, 1997). It was meant for the firms to assist them to provide a process based approach in the SCM and to increase the effectiveness of the supply chain. SCOR has provided common process oriented language to communicate among the supply chain members basically in their main decision areas. These decision areas are: PLAN, SOURCE, MAKE and DELIVER. Recently RETURN's decision is included in the model (Lockamy and McCromack (2004). It is indicated that SCOR allows companies to:

- evaluate their own performance effectively

- compare their performance with other companies both within and outside their industry segment

- pursue specific competitive advantages

- use bench marking and best practice information to prioritize their activities

- quantify the benefit of implementing change

- identify software tools best suited to their specific process requirements

Figure 4: *Supply chain decision categories mapped to SCOR model*
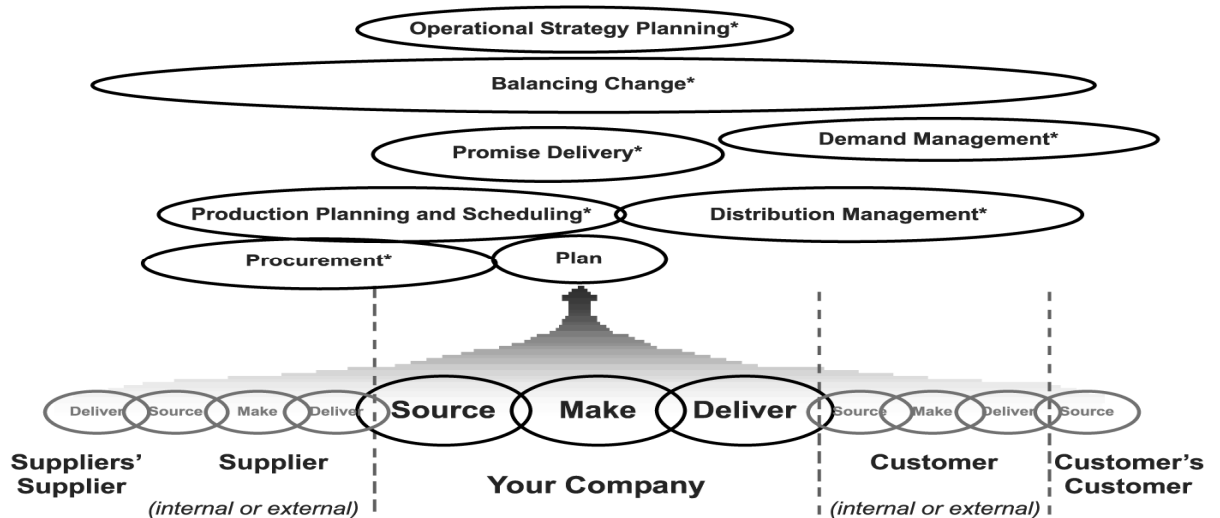
Source: Lockamy and McCromack, 2004

1.4 Supply Chain Management Issues

Supply chain management involves a design of a seamless value adding processes across boundaries of an organization so that it will be able to meet real need of the customer (Fawcett et al. 2007). The design and implementation impose a lot of complex problems and challenges in the process of execution of supply chain management. These major problems must be first well identified in order to proactively come up with problem solving mechanisms.

Faucett et al. (2007) have listed the supply chain design and management problems as:

- Poor coordination of effort

- Incompatible information systems

- Long cycle times

- Communication problems

- Customer service issues

- Excessive waste and environmental degradation

- Relatively high inventory for the level of customer service achieved

- Lower than optimal profits

Chandra and Grabis (2007) have categorized the supply chain management problems into general and specific problems. General problems are those problems that cross multiple specific problems whereas specific problems are those that occur at the vertical direction of problem decomposition and deal with one particular issue. Accordingly they categorized SCM issues and related problems as follows:

- Distribution network configuration

- Inventory control

- Supply contract

- Distribution strategies

- Supply chain integration and strategic partnering

- Outsourcing and procurement strategies

- Information technology and decision support systems (DSS)

- Customer value

For this particular case the researcher is more interested in SCM issues as listed as follows:

- ➢ Supply chain integration and collaboration

- ➢ Supply management and inventory control

- ➢ Distribution management

- ➢ Information communication

- ➢ Environmental Issues

1.4.1 Supply Chain Integration and Collaboration

Supply chain network is the connections between supply chains that share common elements (Cigolini, Cozzi & Perona, 2004). Supply chain management deals with the process that starts from the acquisition of materials up to products and services consumption. This complex supply chain network is composed of multiple backward suppliers, the focal company and the forward stakeholders, distributors, retailers and consumers. This net work has to be dynamic enough in order that the process is flexible enough to respond to the fast changing environment.

The web of networks is formed in the process of supply chain management process where the issue of integration would come into the picture. Enterprise's integration is mainly the linkages between the parts of an organization. Accordingly supply chain integration is a linkage of chains

created from within them and among the supply chain members (Braganza, 2002).The issue of integration is becoming the current issue in the study of supply chain management. Kannan and Tan (2010), citing Dorge et al (2000), outlined a positive relationship between integration and performance indicators, product development time, product cycle time and responsiveness.

Integration does not come by its own. It needs commitment, well planned and relentlessly executed and monitored collaboration among the supply chain members. As discussed by E. Fawcett, Magnan and M. Fawcett (2010), under this competitive dynamics, the goal of unique value creation capabilities can only be achieved through well motivated co-operations among partners in the line. They also referred different previous scholars to highlight the advantages that could be obtained through collaboration. These collaborations provide access to skilled, resources and markets. They also enable to solve problems quickly by generating novel ideas and to transfer technology. Moreover, collaboration reduces lead times, minimizes inventories and increase asset utilization, where all these in turn lowers the cost of production.

However, the execution of supply chain integration is somewhat difficult than what is simply said. Barratt (2004) discussed barriers to supply chain integration as lack of visibility of demand, inventory holding status across the supply chain and adversarial relationship between the trading partners. The following diagram summarizes the driving forces, barriers, and bridges to an effective SCM as well as the benefits of an effective SCM.

Figure 5: A contingency framework for understanding supply chain implementation.

Bridges to Effective SCM

Alignment
Mechanisms

Cross-Functional
Process Change

Performance
Measurement

SC Collaboration

Information
Systems

Alliance
Design

People
Empowerment

Forces Driving SC Collaboration

- More Demanding Customers
- Greater Competitive Intensity
- Shifting Channel Power
- Economic Globalization
- Tighter Alliance Relationships
- Compressed Product Cycles
- Continued Merger Activity
- Need for Better Information
- New Information Technologies
- Shifting Competitive Focus; i.e.
  Companies to Supply Chains

Benefits of Effective SCM

- Unique Products & Services
- Faster R&D Cycle Times
- Superior Quality
- Cost Competitiveness
- Shorter Order Cycles
- Flexible Customer Response
- Enhanced Delivery Performance
- Better Asset Management
- Increased Cash-to-Cash Velocity
- Superior Channel Relationships

Implementation Barriers to Effective SCM

- Lack of Top Management Support
- Non-aligned Strategic and Operating Philosophies
- Inability or Unwillingness to Share Information
- Lack of Trust Among Supply Chain Members
- An Unwillingness to Share Risks and Rewards
- Inflexible Organizational Systems and Processes
- Cross-functional Conflicts and "Turf" Protection
- Inconsistent/Inadequate Performance Measures
- Resistance to Change
- Lack of Training for New Mindsets and Skills

Source: Fawcett et al. (2008)

1.4.2 Supply Management and Inventory Control

Supply Management is also commonly called "Sourcing or Purchasing Management". As identified by Fawcett et al. (2007) the developments that happened in the purchasing process help companies meet these new competitive threats as:

- Purchased inputs are the primary operating cost.

- Greater emphasis is given on cooperative, long-term buyer–supplier relationship as required by Just-in-time (JIT) manufacturing revolution.

- Large amount of information that are needed for strategically managing buyer-supplier relationships made possible to be stored and tracked via the new information technologies.

- Better trained and competent managers began to enter into the system.

This implies that the opportunities that prevail in the current competitive world would lead to a total chaos to the whole supply chain if the procurement process is not well done and managed

As indicated above in SCOR model, sourcing comes after planning. Sourcing refers to the acquisition of the necessary inputs for the process of manufacturing and operations. It has its own process as indicated below.

Figure 6: Procurement process
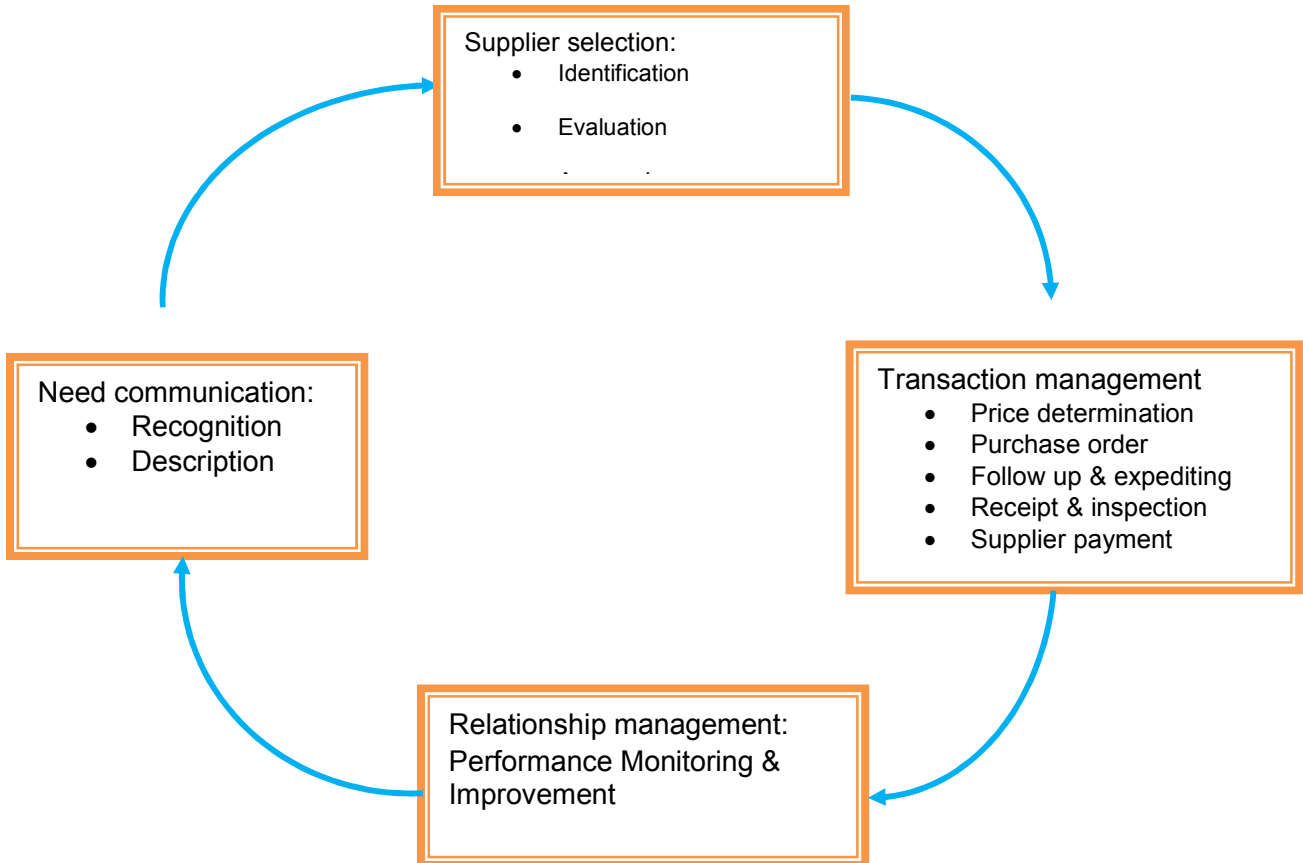
Source: Fawcett et al. 2007

The decision at procurement process would be a binding contract for the organization and it has a great impact on operations, inventory level and quality of product and services to be delivered to customers. The objective of procurement is basically attainment of what are commonly known as 5R's. These are the procurement of good quality product at a right quantity, from the right source at a right time with a right price.

Quoting the American for Quality, Heinzer and Render (2007, 156) has defined quality as "the totality of features and characteristics of a product or services that bear on its ability to satisfy stated or implied needs". This quality level must be well recognized first by the focal company and at the same time should be communicated to the suppliers. Finally upon arrival of the items, there should be a monitoring and control mechanism to ascertain its conformance. Unless and otherwise these processes are well done, the delivery of poor quality materials will affect all the coming steps and in the end there would be a costly transaction and unsatisfied customers.

The quantity that is required should be optimal so that companies shall not run out of production due to any possible shortages. On the other hand excess inventory could lead to high inventory carrying cost. As mentioned by Blanchard (2010), companies are prone to keep up safety stock and incentivize its staffs to avoid any possible stock outs. The other major indicator of inventory accumulation is what is known as "bullwhip effect". Piak and Bagchi (2007) discussed bullwhip effect as a small order variability that is amplified by the members of the supply chain. At the end of the day each members would be forced to increase their level of stocks with an intention of managing variability and uncertainty. They underlined bullwhip effect would increase inventory holding costs, inefficient use of resources, poor customer services and profitability.

Right source refers to the suppliers. Right suppliers are those who can deliver high quality materials and services at every time. The relationship that is established with critical items and services suppliers is very important for the success of every company. The number of suppliers to work with depends upon the technological sophistication of the items, characteristics of the supply market, supplier capabilities and philosophy of the buyer (Fawcett et al. 2007). There has to be a supplier's performance measurement process that collect and provide information to measure, rate, or rank suppliers on a continuous basis. This measurement scheme would enable to separate critical few suppliers from trivial many (Trent, 2010).

Price and time are also the main components of effective procurement processes. The purchasing price of goods and services has a direct impact on the final prices for which customers are requested for. Delayed or long lead time elongates the cycle time of the product to the market. Delay in material flow to the system causes any kind of production disruption.

Therefore, as discussed above, procurement plays a major role either for the success or failure of the whole supply chain management system. Working in close alliance with strategic suppliers, follow up and measurement of suppliers performance, uninterrupted follow up and

performance measurement with dedicated and modern information flow among involving members enable companies to shorten lead times, minimize purchasing and inventory costs and in the end ensure the satisfaction of customers.

Inventories are expensive unless and otherwise they are properly managed. Costs are reduced by managing inventories. A low cost strategy can be attained by striking the right balance between inventory investment and the level of customer services, going only to reduce inventory costs may lead to production stoppage and stock out for the customers (Heizer and Render, 2007). The very objective of inventory control is to support the high levels of customer satisfaction with optimal inventory level (Fawcett, 2007). In addition, an optimal level of investment and the accuracy of inventory system records equally play an important role in reducing costs and service delivery. According to Barratt, Rabinovich and Sodero (2010) cycle inventory is the main tool to rectify inventory record inaccuracy. They went on to say that when the system record is higher than what is actually available, at the end of the day operations would freeze due to stock outs. The other extreme scenario is when the physical count is more than what the record system shows, due to the recording fallacy, there would be an inflated inventory which would be costly to the organization.

1.4.3 Distribution Management

A best in class distribution performance makes firms to be the leaders in delivering goods and services to customers consistently in a defined set of quality and service levels at least possible costs (Ebert, Venkataraman and Hu, 2010).

According to Micheal Porter's value chain frame work, this refers to the outbound logistics part of a chain. It involves finished goods warehousing, materials handling, freight delivery, order processing and scheduling (Blanchard, 2010).

According to Fawcett et al (2007), finished goods could be stored either at the manufacturing facilities or at the distribution centers. They also underlined the significance of caution that should be undertaken in the process of transportation, management determining highly cost, availability and reliability of goods and services.

Different distributions channels are used to enable the target customers buy the products at the desired point of purchase. These points of purchases could be online or through retailers and distributors, where their performance shall be evaluated against their level of customer reach, operating efficiency and service quality (Best, 2009).

1.4.4 Information Communication

Supply chain management could be mentioned as a co-ordination of materials, information and financial flows along supply chain to satisfy the ultimate need of the customers (Stadtler, 2005). These days information is not only a resource, but it is a main resource of securing a competitive advantage in coordinating within and across organizations activities.

Though it still exists in some places, in old days, information were transferred through paper based media, like paper purchase requisitions, purchase orders, invoices, receiving forms and the so on. However, ineffective information communication is becoming a hindrance to supply chain collaborations as globalization brought about the essence of competition one supply chain with the other supply chain member (Fawcett et al. 2005).

According to Williamson, Harrison and Jordan (2004), collection of IT resources and communication networks, hardware IT applications, standards for data transmission and human skills and experiences is called inter organizational information system (IOS). They categorized the evolution of IOS into four phases as described below as:

- Phase One: information that passed through paper copies where sharing of information among supply chain was limited

- Phase Two: development of Electronic data interchange (EDI) – purchase orders, invoices as well as order status, pricing enquires and scheduling transactions were processed on it.

- Phase Three: Enterprise Resource Planning (ERP) systems were developed to integrate the business of suppliers and customers through an integrated database environment.

- Phase four: The use of Web Development Technologies enabled two way flow of information among strategic partners that allow accelerating their decision making in the SCM processes.

Bowersox, Closs and Cooper (2002), identified four reasons in which the importance of timely and accurate information are becoming important in this contemporary supply chain management era.

- Order status, inventory availability, delivery schedules, shipment tracking and invoices information are required by managers in timely manner to secure an outstanding level of customer satisfaction.

- In the case of uncertainty, information is becoming a substitute for inventory and other resources, where effectively applied it would enable to reduce costs immensely

- Enables to get a competitive advantage, as it increases the firm's flexibility in the utilization of its resources.

- The supply chain relationship among members is changing from adversarial to partnership as it is simplified and used via a based information sharing

Information Technology enables one to exchange information instantly with a least cost. This technology enables various people, teams, functions and organizations to work together as a team along the supply chain (Fawcett et al, 2005). These relationships and its impact of information exchanges to secure customer satisfaction and competitive advantage is depicted in the following diagram, as described by Stadtler (2005) as a house of supply chain management.

Figure 7: The house of supply chain management
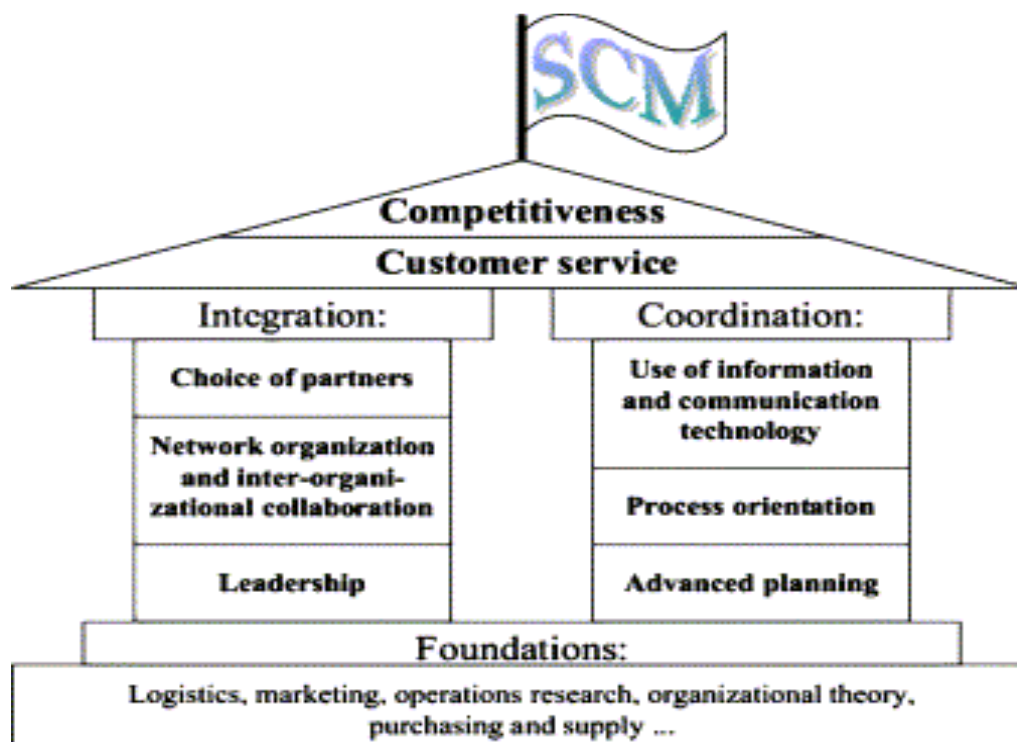
Source: Stadtler, 2005

Citing Radjou (2003), Wu, Yeniyurat, Kim and Cavusgil (2006) developed a construct to highlight the level of supply chain capabilities. Citing various authors, they further described supply chain capabilities as the ability of the organization to identify, utilize, and assimilate both internal and external resources/information for the smooth operation of the whole supply chain. Accordingly, they identified the four dimensions of supply chain capabilities as information exchange, coordination, activity integration and supply chain responsiveness. Information exchange is the ability of the supply chain members to share information in such a way that it is to the required level. Firms have to coordinate their materials, money, asset and human capital as these all help to reduce transaction costs and improve efficiency for the whole supply chain. Supply chain members should integrate their activities and technologies. The former refers to activities like planning and forecasting while the later refers to the level of technology alignment. In general, responsiveness refers to the level of the supply chain members cooperatively responding to the continuous changing environment. They indicated that IT would:

- Improve supply chain agility

- Reduce cycle time

- Achieve higher efficiency

- Deliver products to customers in a timely manner

In the study of Roberts (2000) and as cited by Williamson et al (2004), the use of internet in the process of SCM would enable to gain a 8-35% reductions in supply chain costs, 22-85% reduction in inventory, 12-24% delivery time improvements and 17-68% cycle time improvement.

According to Fawcett et al (2007), under this contemporary supply chain management processes, two things must to be available to ensure that the current information system works as an efficient and effective information source. These are the issue of connectivity and willingness. The former is the investment in the technology to connect the people both within the company as well as across the supply chain. Willingness refers to the people desire to use and share information within and across the supply chain. They further identify some challenges that are involved in information systems.

- Weak or counterproductive relationships – if there are any adversarial relationships, sharing of information would be unthinkable.

- People – due to various concerns and passions, people may not be in a position to share information among their partners

- Power – in those days information was considered as power. If one wishes to secure this power, he/she may be tempted not to share it willingly.

- Trust – if partners do not have trust among themselves, they are not willing to share information.

- Security and risk – unless a proper security measures are in place, sharing of information may lead to the loss of its main strategic competition tool.

- Too much information – it is important to capture, analyze and disseminate that are great for making important decisions.

- Lack of standards – common terminology and communication standards should be developed that enable smooth communication among the member of the supply chain.

- Inaccurate information – distorted information lead to bad decisions which is disaster to the whole supply chain members.

1.4.5 Environmental Issues

Companies work within an environment. Their decisions have a great impact on the society. Therefore, they are accountable for what they brought for. Generally, the consideration of the impact of firms' actions on the society is what we call a "Corporate Social Responsibility". These responsibilities include: economic, legal, ethical and philanthropic. First and foremost businesses must produce goods and services, deliver it at required prices and places and in the end they must make profit to survive and grow. They should also comply with what articulated in the law. As all things may not be put in the law, it is also important for firms to work

ethically meeting the societal norms, standards, values and expectations. A philanthropic responsibility refers to the public expectation on business to give back in the form of corporate, product and services donations and other voluntary involvements (Buchholtz and Caroll, 2009).

As discussed by Norman and McDonald (2004), the ultimate success of business should not only be measured by its records shown at their traditional financial bottom line. But it shall also include economic, social and environmental issues as mentioned in a Triple Bottom Line (TBL). Citing Zadik (2001), Buchholtz and Caroll (2009) further discussed each of these bottom lines as follows:

- Economic refers to the financial assets and created ncomes

- Social refers to equity and quality of life

- Environmental refers to the protection and conservation of the environment.

Deterioration of the environment like the diminishing of the raw material resources, overflowing of waste sites and increased levels of pollution has increased in the world these days. Following this, researchers and practitioners began to promote the concept of green supply chain management (GrSCM). According to Srivastava (2007) GrSCM is defined as "integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing

processes, delivery of the final product to the customers as well as end of life management of the product after its useful life".

Citing Esty and Winston (2006), Thompson et at (2007), listed 10 top environmental issues as: climate change, energy, water, biodiversity and land use, chemicals, toxics and heavy metals, air pollution, waste management, ozone layer depletion, oceans and fisheries, and deforestation. Climate change is given due consideration these days due to the fact that some of human activities deplete the ozone layer at an alarming rate. Energy issues should be reflected in energy inefficiency or usage of nonrenewable sources of energy. Acid rain, global warming, smog and depletion of ozone layer happen due to air pollution. Unless wastes are reduced, re – used or recycled, they all will affect the environment.

Ignoring these issues has wide range of costly consequences. Some of these consequences are easily detected but others are hidden and difficult to track down. Government fines and civil penalties are clearly seen in terms of costs incurred to the company. Costs like legal and investigation costs, costs of taking corrective actions and administrative costs incurred for future compliances are covered in the general costs of an organization. Customer defections and loss of reputations have devastating consequences and are difficult to quantify them as well (Thompson et al, 2008).

According to McCrea (2010), these days' companies are discovering that greener and most sustainable supply chain is not only good for the environment, but also for business firms. He has quoted Dale Rogers (Director for the center for Logistics Management and foundation professor of SCM at the University of Nevada) and said that "Firms are doing it because the market place is demanding it and by now it is a competitive necessity."

2. Overview of Cement Industry

Cement is the binding substance used mainly in the construction and building industry. Though the use of cement in construction has been started since the ancient Egyptian and Roman era of civilization, the use of cement in its present form started in the 19th century. It is made up of ingredients called limestone, silica, aluminum and iron ore that are mainly found in lime stone and clay. The process is described as follows.

Firstly, the raw materials (lime stones and clay) are extracted from quarry. Secondly, they are crushed in the crusher and conveyed to the area of storage and homogenization. Then, they are grounded into raw mill for further fine crushing. Next, the material goes through the pre heater to the kiln where it is baked up to temperature level of 1500°C and finally gets cooled to yield what is called clinker. Finally, they are grounded with additives like gypsum and

pumice and milled together at a cement mill, which give rise to what is called cement (Lafarge, 2010).

Figure 8: Cement production process
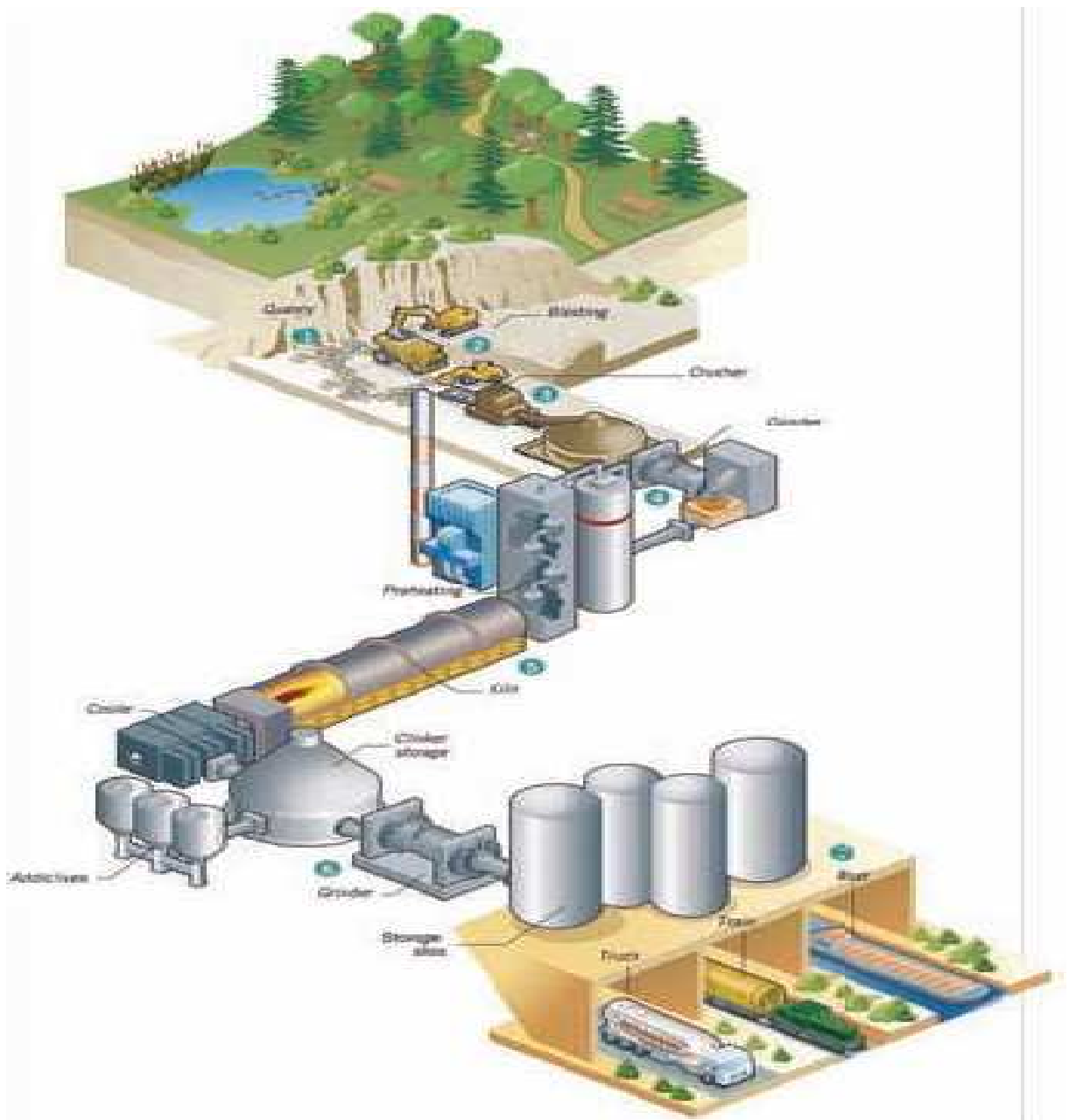
Source: Lafarge, 2010

Cement is basic ingredient in the construction industry and for sustainable development of different infrastructures of nations. It is capital intensive and energy consuming industry. However, the production of cement is growing despite the world financial crisis that happened in the past few years. During the year 2010, the world cement production was estimated to be 3.3Bt, an increase of 9.2% from the year 2009. From this quantity, China only accounts for 1.9Bt which is 56.1% of the global cement production (*CEMBUREAU 2010)*.

Table 1: *Main World Cement producers – The G-20 group*

Country	Cement production° (Million tons)						
	2001	2005	2006	2007	2008	2009	2010p
China	579.0	1068.8	1236.8	1361.2	1388.4	1650	1868
India	102.5	142.7	159.0	170.5	183.3	186.9	210.0 e
EU	229.9	248.0	264.8	271.0	251.7	201.5	190.4
USA	87.8	99.3	98.2	95.5	86.3	63.9	65.5
Turkey	36.0	42.8	47.4	48.3	51.4	54.0	62.7
Brazil	39.8	38.7	41.4	45.9	51.6	51.4p	58.9e
Japan	83.3	68.7	69.9	67.8	63.0	54.9	51.7
Russian	32.4	48.7	54.7	59.9	53.5	44.3	50.4
Re. Korea	51.3	47.2	49.2	52.2	51.7	50.1	47.2
Sa. Arabia	18.2	26.1	27.0	30.3	37.4	37.8	41.0e
Mexico	32.3	36.0	38.8	39.5	38.3	37.1	38.9
Indonesia	27.7	33.9	33.0	35.0	38.5	36.9	37.8
Italy	38.9	46.4	47.8	47.4	43.0	36.3	c
Germany	35.4	31.2	32.9	32.3	32.5	30.0	c

France	19.2	20.9	22.0	22.1	21.2	18.3	c
Canada	12.8	13.5	14.3	15.1	13.7	11.0	12.4
S. Africa*	8.2	12.1	13.1	13.7	13.4	12.0	12.0
Argentina	6.1	7.6	8.9	9.6	9.7	9.4	10.4
Australia	7.5	9.1	9.2	9.6	9.7	8.7	9.3e
UK	12.5	11.6	12.1	12.6	10.5	7.8	c

Notes: ° Cement production including cement produced with imported clinker

p: Preliminary - *: Estimation including cementitious - e: Estimation - c: Confidential

Source: CEMBUREAU 2010

Lafarge (France), Holcim (Swizerland), Heidelberg (Germany) and CEMEX (Mexico) are the four largest firms that produce about 23% of the whole cement demand in the world. The first top three cement producers are Lafarge, Holcim and Cemex that have a capacity of producing 166.7, 155.2 and 98.2 million tons of cement per year, respectively. Lafarge is working in Egypt, Kenya, Morocco, Nigeria, Uganda and Zimbabwe. Holcim is operating in Egypt, Morocco and South Africa while Cemex is operating in Egypt (Lasserre, 2007).

According to the 2006 US geological survey report, the production of cement in the Sub Sahara Africa (SSA) is categorized into four regions is as follows.

Table 2: Cement production in SSA

It. No.	Regions	No. of Plants	Cement Production capacity (tons)	Cement Actual production (tons)	Capacity Utilization
1	West Africa	29	19,241,000	8,779,130	46%
2	Central Africa	11	3,613,000	1,720,000	48%
3	East Africa	29	8,954,000	6,768,110	76%
4	South Africa	6	13,145,000	12,348,000	94%
Total		75	44,953,000	29,615,240	66%

Source: World Bank/CF Assist, 2009

Sub Sahara African's average per capita cement consumption is about 70 kg, which is the lowest compared to the world's average per capita cement consumption of 340 kg (Lafarge, 2007).

Citing IEA (1999), Szabo, Hidalgo, Ciscar, Soria and Russ (2003) indicated that Cement industry is an energy intensive industry that covers 30 – 40% of the production cost and taking 2% of the whole world energy consumption. It accounts 5% of the global C_o2 emission during the calcinations process. It also consumes electricity 25 – 30KWH per ton of cement. 1.5 -1.7 tons of raw materials is needed to produce one ton of cement.

Due to strict environmental control procedures in the developed countries, global companies may shift to countries that are considered to have loose environment regulations. These developing countries may give priority to their apparent effect due to their keen interest in industrialization, export proceeds and their internal infrastructure requirements. Cement price is price inelastic as it does not have as such apparent substitute. Though there may be at times a decrease in cement demand from the private sector, governments never stop their spending huge amount of money in the cement demanding infrastructure sector (Selim and Salem, 2010).

The cement weight to price ratio makes transportation cost high (Lasserre, 2007). Cement is a homogenous product with limited shelf life time. In Africa selling is given priority than dealing with differentiations and value proposition (Rensburg and Niekerk, 2010). Cement industry's competitive dimension could be easily seen in the following self explanatory diagram applying Porter's five forces.

Figure 9: the five competitive forces that shape global cement industry
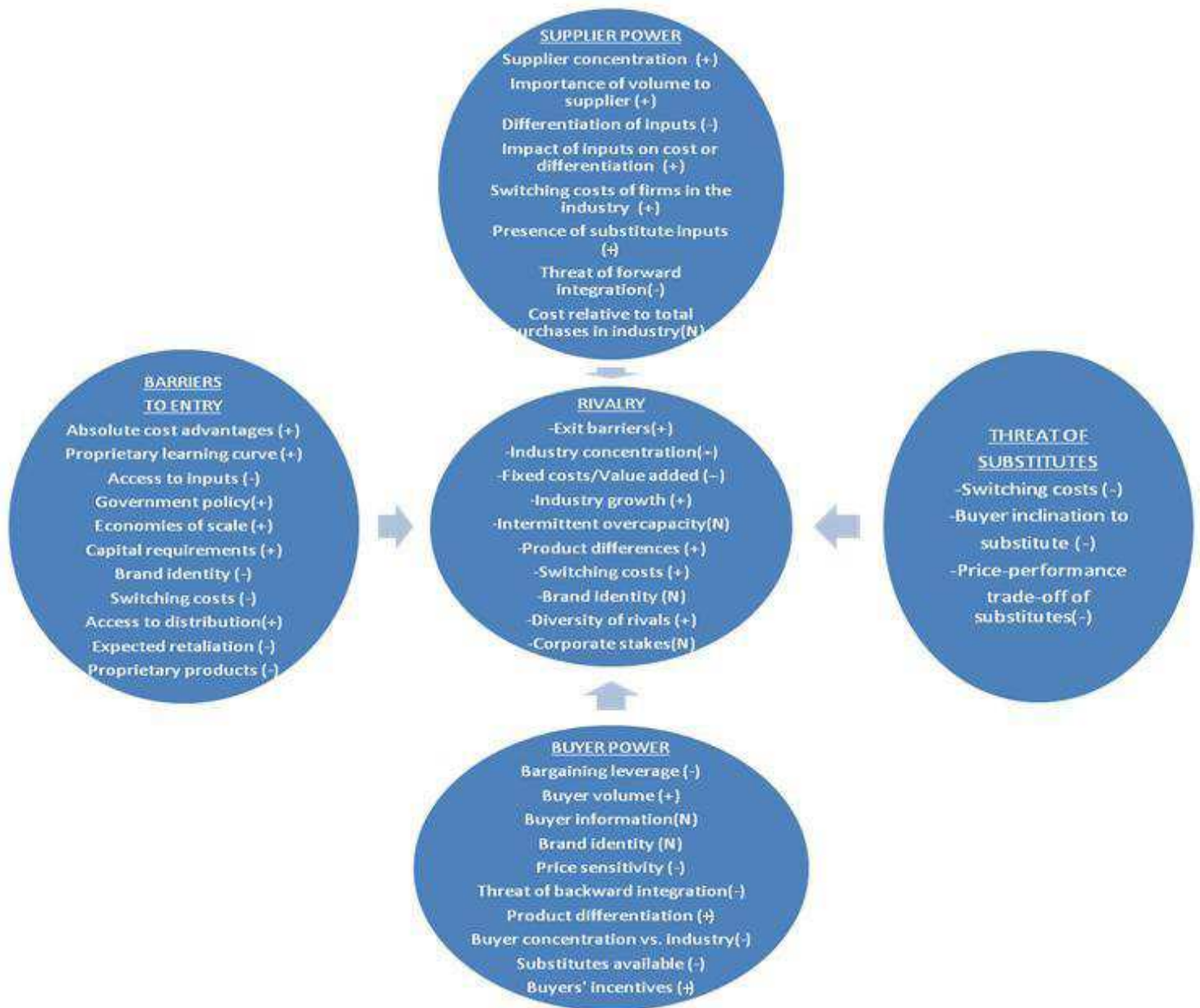
A plus sign means that the force has an effect on the cement industry in intensifying rivalry. A minus sign means that it plays an opposing role. An (N) means that the force has neutral or no relevance to the industry.

Source: Selim and Salem, 2010

3. Cement Industry in Ethiopia

Ethiopia is located in the horn of Africa, with a total land area of 1,221,900 square kilometers. In the mid 2010, its population is estimated to be 75 million (Economic intelligence unit country report, 2011).

According to the Ministry of Finance and Economic Development (MoFED) brief note on the 2009/2010 budget year GDP estimate, the estimated average economic growth (GDP at constant basic price) was 10.4%. The three sectors i.e. Agriculture, Industry and Services share 42%, 13% and 45% of the GDP, respectively.

In a survey conducted in the year 2009 by FDRE - Central Statistical Agency (CSA), during the year 2007/2008, there were about 1930 large and medium scale manufacturing establishments. They are categorized into 15 groups and among these the largest share (25.28%) goes to what is named as Other Non – Metallic Products Industrial group. This industrial group is composed of glass and glass products, structural clay products, cement, lime and plaster, article of concrete, cement and plaster.

In Ethiopia, the first cement factory was established in the year 1938, in Dire Dawa at the eastern part of the Ethiopia. Its capacity was 40,000 tons per year. In the year 1957 (EC), the second plant that has a capacity of 70000 tons per

year was erected in Addis Ababa. A year later another factory, a yearly capacity of 70000 tons of cement, started production in Massawa , which was once one of Ethiopian province, but now is under the Eritrea. Mugher Cement Enterprise, with two lines with total capacity of 600000 tons of clinker, started its first production in 1984 and the second in the year 1990 (Mugher Cement Enterprise, 2002). Now the number of plants has reached 11 as listed under table 3 below.

Table 3: Current and planned cement production from the existing plants

It no	Company name	Cement Production in '000tons					
		Capacity	2010/11	2011/12	2012/13	2013/14	2014/15
1	Mugher Cement	876	657	876	876	876	876
2	Messobo Cement	840	630	840	840	840	840
3	National Cement	150	112.5	150	150	150	150
4	Abysinia Cement	90	67.5	90	90	90	90
5	Jema Cement	15	11.25	15	15	15	15
6	Red Fox Cement	100	75	100	100	100	100
7	Huwan Shang Cement	435	326.25	435	435	435	435
8	Zhongshang Cement	250	187.5	250	250	250	250
9	Debre Sina Cement	90	67.5	90	90	90	90
10	Derba Midroc (Dejen)	90	67.5	90	90	90	90
11	Hu Wa Yu	150	56.875	150	150	150	150
	Total	3086	2259	3086	3086	3086	3086

Source: Ministry of Industry

Table 4: Planned cement production from expansion projects

It no	Company name	Cement Production in '000tons					
		Capacity	2010/ 2011 (75% capacity)	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015
1	Mugher Cement	1400	0	1120	1400	1400	1400
2	Messobo Cement	1400	0	1120	1400	1400	1400
3	Jema Cement	30	0	24	30	30	30
4	Derba Midroc (Dejen)	90	0	72	90	90	90
	Total	2920	0	2336	2920	2920	2920

Source: Ministry of Industry

Table 5: Cement factories at project level and expected to produce cement within coming years

It no	Company name	Cement Production in '000tons					
		Capacity	2010/ 2011 (75% capacity)	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015
1	East Cement	750	0	366	637.5	750	750
2	Ture Dire Dawa	300	0	98	255	300	300
3	Ethio Cement	378	0	123	321.3	378	378
4	Ethio Cement	378	0	0	0	245.7	321.3
5	Enchini Bedrock	300	0	0	195	255	300
6	C.H. Clinker Manufacturing	900	0	0	765	765	900
7	Derba Midroc (Derba)	2300	0	0	0	1121	1955
8	National Cement (Expansion)	1200	0	0	1020	1020	1020
9	Habesha Cement	1200	0	0	0	0	780
	Total	7706	0	587	3553.8	5668.7	7229.3

Source: Ministry of Industry

According to the Ministry of Industry 2010/2011 nine months report, the followings are companies that took investment land and are expected to actively involved in the execution of their projects.

- Lafarge Cement Plc

- Dangotte Industrial Plc (2.5 million tons)

- North Holdings Plc (7.8 million tons)

- Sino Saudi Plc (750,000 tons)

- Sunrise Industrial (3 million tons)

- B.M. Cement Technology ((1.6 million tons)

- M.W.K. Plc (450,000 tons)

In the year 2008/2009 and 2009/2010 the cement demand was 6-7 and 8.8 million tons, respectively. Considering the 20-25% of the past years cement demand growth, Ministry of Industry has forecasted that for coming five years it will grow by 25% (Ministry of Industry, 2010). This forecast is based on the five Years Ethiopian Growth and Transformation Plan (GTP). At the end of this five year plan, the Ministry forecasted to produce 27 million tons of cement and meet the 300 kg per capita cement from the existing 35 kgs (MoFED, 2010).

Table 6: Cement Demand forecast

It no.	Budget year	Cement Demand in million tons
1	2009/2010	8.8
2	2010/2011	11
3	2011/2012	13.8
4	2012/2013	17.3
5	2013/2014	21.6
6	2014/2015	27

Source: Ministry of Industry

As indicated in table 3, 4 and 5, the cement capacity that will be gained during the year 2014 is 13.235 million tons of cement. When we compare it with what is forecasted during the same period as indicated in table 6, there will exist a huge deficit. This shows that there is untapped market in the country which would attract both local and multinational companies.

It is important to see the Ethiopian industry competitive forces using the Porter's five competitive forces model. Mugher cement Enterprise, which is the oldest and the biggest cement factory in the country has undergone the

industry competitive analysis to prepare its 2020/2011 - 2014/2015 strategic plan (Mugher Cement Enterprise, 2010). Accordingly, the industry analysis looks:

- Rivalry between establish firms – few years ago there were only two cement factories and could sell easily what they could produce. This time the number of cement factories has reached to about 11 and some others will resume operations very soon. Though rivalry is not now seemingly stiff as such, it is expected to come sooner at some other time.

- New entrants - though the industry is highly capital intensive, there are major reasons that the industry may attract capable multinational companies. Government is promoting investors to enter into cement investment due to the fact that it is becoming a bottleneck for the cement demanding private investors as well as for its own infrastructural sector requirements. Economies of scale are very high as it is homogenous product that is produced in an integrated process. Due to this and high profit margin that the existing few companies are enjoying, it is a fertile ground to attract capable entrepreneurs.

- Bargaining power of customers – there is a high demand and supply gap in the market. The former supersedes the latter by far.

- Bargaining power of the suppliers – the main raw materials like lime stone, gypsum and pumice are found in the local market and most of

the cement factories own the mining fields. However, spare parts, components, fuel, packing materials and main utilities are mostly owned by few or at times with sole suppliers where most of the time the suppliers do have a strong bargaining powers.

- Threat for substitute products – cement as such does not have perfect substitute.

The enterprise has also identified the key success factors which are all relevant to the whole country cement industry. These are:

- Full capacity utilization – to attain the economies of scale, one has to share the volume of the overheads and secure the maximum level of sales. Moreover, it is important to work to the level of maximum capacity.

- Managing energy consumption – as it is mentioned so many times, cement industry is an energy intensive industry. Managing such source of expenditure has double advantage both in cost saving and proactively responsive to the environment effect.

- Innovation – though the product could be said homogenous, it is possible to serve the customers in different value proposition especially in the service delivery.

- Proximity to the market – the weight to price ratio of cement makes the transportation of cement expensive. Therefore, being near to the market

would be a great advantage to those who are working near to the market.

- Maintenance efficiency – machinery availability would help companies to fully utilize their capacity. Planned preventive maintenance and prompt action on accidental breakdowns is so much worthy in this industry.

- Information technology – information is becoming source of competitive advantage in every sphere of activity. Information with suppliers, within the organization and all the way to the market are very important in the process of sourcing, making, delivery of goods and services to the customers.

- Reputation – every effort starts from a customer and ends in the customer. A satisfied customer would be loyal and retained for long time which is leading to the sustained profitability of the company. On the other hand, if customers were kept because of the fact that they do not have any alternatives, would move to those options when the time comes to attract them. Therefore, it is important every time to give a due consideration for the goodwill of the company though this time things seem at the hands of the company.

CHAPTER THREE

RESEARCH DESIGN AND METHODS

Research design is the framework that provides the overall structures for the procedures that a researcher follow the data that the researcher collects and the data analysis the researcher conducts (Leedy and Ormarod, 2010).

1. Research Methodology

There are different research methodologies that are used, depending on the type of research that are undertaken. In this research descriptive survey research method is used as the researcher wants to identify and explore the correlation among the identified variables with the firms' competitive position. In this methodology, the researcher poses questions to willing participants, summarized and analyzed them and finally inference is made for the population form the drawn samples (Leedy and Ormarod, 2010).

2. Population and Sample

As defined by Diamantopoulos & Schlegelmilch (2000), "population is the totality of entities in which we have an interest, i.e. the collection of individuals, objects or events about which we want to make inferences"; "sample is part of the population."

In this research, the population includes all cement factories operating in Ethiopia. These firms are established in Ethiopia and are involved in the production and distribution of cement in the Ethiopian market. Samples are some of the cement factories selected from all cement factories found and operating in Ethiopia.

There are different sampling methods to be used in different researches. Sampling methods are basically grouped into two; probability sampling and non – probability sampling methods. In the case of the former sample numbers are chosen randomly for inclusion in the sample, with each population having an equal probability of being selected. On the other hand non probability sampling method is where samples are chosen on the basis of their availability or accessibility (Diamantopoulos & Schlegelmilch, 2000).

Diamantopoulos & Schlegelmilch (2000), have further classified non probability sampling method into judgmental, purposive and quota sampling.

The population (Cement industry in Ethiopia) is small and members are definitely known. For this population, the researcher applies simple random sampling method. Under this sampling method every member of the population would have an equal chance of being selected (Leedy and Ormarod, 2010).

As the researcher is going to analyze the challenges that cement industries may face and their relationship on their competitive positioning, all participants are involved and give strategic decisions on supply chain management issues within the organizations. There are 11(eleven) Cement Factories that are operating in Ethiopia. Out of these eleven cement factories, the researcher has randomly selected 7(seven) of them.

As supply chain management is a new conceptual framework and applied at the upper level of management, the researcher has identified those members that will be respondents in every organization. Accordingly, the respondents are identified as: general managers, supply managers, technical managers, production managers, quality managers, sales managers and IT managers. That means seven respondents from every firm would count a total of 77 respondents.

3. Data Collection and Methods

In a research data addresses three issues; the topic of interest, the respondents and the responses of respondents in relation to the topic of interest (Diamantopoulos & Schlegelmilch, 2000).

Data could be collected in different methods. In survey research the most applicable methods are face-to-face interview, telephone interview or written questionnaire (Leedy and Ormarod, 2010).

In this practical case the researcher applies a written questionnaire and as the case may requires face-to-face briefings. In order to quantify and evaluate data, a rating scale technique what is known as Likert Scales is used for the collection of data (Leedy and Ormarod, 2010).

4. Data Analysis and Techniques

The data collected has to give meaning to what it is intended for. As discussed by Diamantopoulos & Schlegelmilch (2000), data analysis begins with doing some data description and followed estimation and/or hypothesis testing. Data description is what is called descriptive statistics that measures the central locations (mode, median and mean) and variability (variance and standard deviation). Inferential statistics helps to analyze how the data collected are related to the hypothesis and how they are generalized to the population.

Accordingly, the researcher first constructs a frequency distribution; present it in the form of different graphical representations, measures the mode, median and mean (measuring the central location) and the variability (variance and standard deviation). Finally the inferences are made based on various methods of hypothesis testing.

As the research deals with more than three variables to test their relationship with the competitive position of cement firms in Ethiopia, the researcher has applied Kendall's Tue and One-way ANOVA statistical techniques (Diamantopoulos & Schlegelmilch, 2000).

The researcher uses computer software called Statistical Package for Social Science (SPSS) for entering, analyzing and making inferential decisions of the data.

5. Reliability and Validity

Reliability refers to the extent to which the instrument measures what is intended to measure and validity refers to the consistency with which a measuring instrument yields a certain result when the entity being measured hasn't changed (Leedy & Ormrod, 2010). They further categorized into internal and external validity where the former refers to the extent to which its design and the data it yields allow the researcher to draw accurate conclusions about cause-and-effect relationship within the data. The external validity refers to the extent to which the research results apply to situations beyond the study itself.

In this particular research, the respondents were clearly communicated on the contents of the questioner as well as the objectives of the research. The draft research was reviewed by different acknowledged individuals. The research framework is constructed based on acknowledged and published theories. Finally, the respondents selected are the top management groups of every organization that are involved into the day to day supply chain management planning and decisions. Accordingly, the researcher expects that the respondents have given credible answers that would probably be answered to another future independent researcher.

6. Ethical Issues

Leedy & Ormrod (2010) identified four main ethical issues that need to be addressed in the process of undertaking a research. These are: protection from harm, informed consent, right to privacy, and honesty with professional colleagues.

Accordingly, the researcher:

- Tries to not to expose participants from any physical or psychological harm

- requests their consent and could participate only on a voluntary basis

- Respects the participants right to privacy

- Reports the findings in a complete and honest fashion.

CHAPTER FOUR

Data Presentation and Analysis

The research result is presented in to two parts: the first part covers the descriptive statistics of the supply chain management challenges as experienced in the Ethiopian Cement Industry and the second part includes the testing of the null hypothesis either to accept or reject them.

1. Data Processing

After data are collected, they need to be cleaned by editing for the possible avoidance of errors in the data matrix questioner both during and immediately after the collection of data (Diamantopoulos & Schlegelmilch, 2000). Accordingly, the researcher cleans the data to avoid any inconsistencies, ambiguous answers and missing information. Following the Data edition and correction, data are coded so that it will be understood and analyzed by a computer software program called SPSS 19. Data analysis is made into two forms, descriptive statistics and hypothesis testing.

2. Respondents' Profile and Descriptive Statistics

2.1 Response Rate

The list of cement factories as obtained from Ministry of Industry is the basis for the sample framework. Out of the 11 cement factories that are currently operating in the country, 7 firms were randomly selected for this particular case. Selected respondents are general managers, supply

managers, technical managers, production managers, quality managers, sales managers and IT managers. A total of 77 questioners were disseminated in person to factories residing in Addis Ababa and its surroundings while for those found at a distant places questioners were emailed, faxed and mailed to the respondents. A continuous telephone, email and visit reminders were forwarded to the respondents. Some of the respondents contacted complained that they are so busy, and some of them were considering the response as a disclosure of company internal information to competitors. The researcher has done his level best effort to convince them by enhancing their level of understandings and informing them the mutual benefits that would be gained as a result of this study. With all these challenges and level of efforts 50 respondents returned, out of the 77 questioners distributed.

Response rate =

$$\frac{The\ number\ of\ respondents\ that\ cooperated}{Total\ number\ of\ selected\ respondents}$$

$$= \frac{50}{77} \approx 65\%$$

2.2 Descriptive Statistics and Respondents' Profile

2.2.1. Respondents' Profile:

The majority of the respondents, ten respondents work in the position of technical/production manager. Eight of them work as a mechanical/ electrical division head, five as a general manager. Moreover, four of the

respondents each work in the position of commercial/marketing manager, supply manager and finance manager while two each work in the position of factory manager, IT Manager & quality controller.

Figure 10: Number of respondents by position
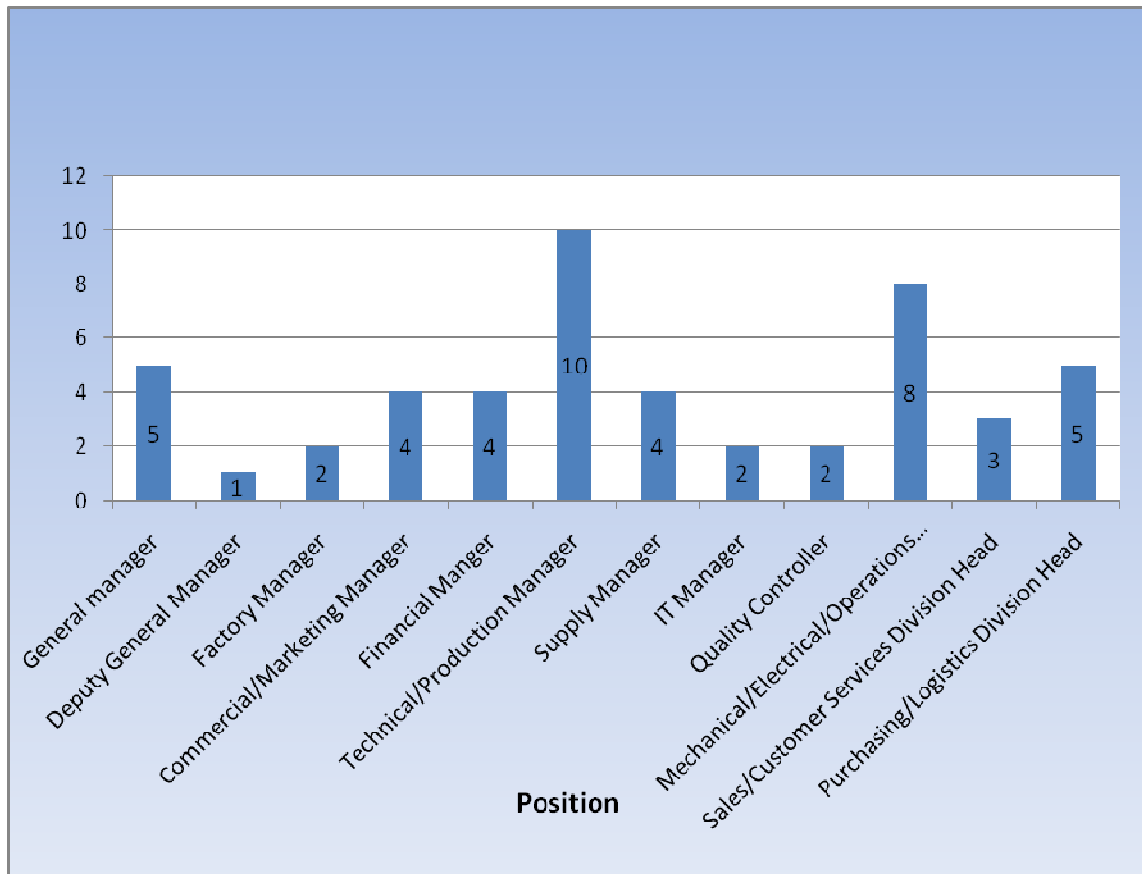
The majority of the respondents about 37 were degree holders, while the next higher respondents were with masters' degree.

The majority of the respondents about 16 had five to ten years service, while 3 were within a service year of 15 to 23 years. Only 5 of the respondents were with more than 20 years of service.

Figure 11 Number of Respondents by Educational level.
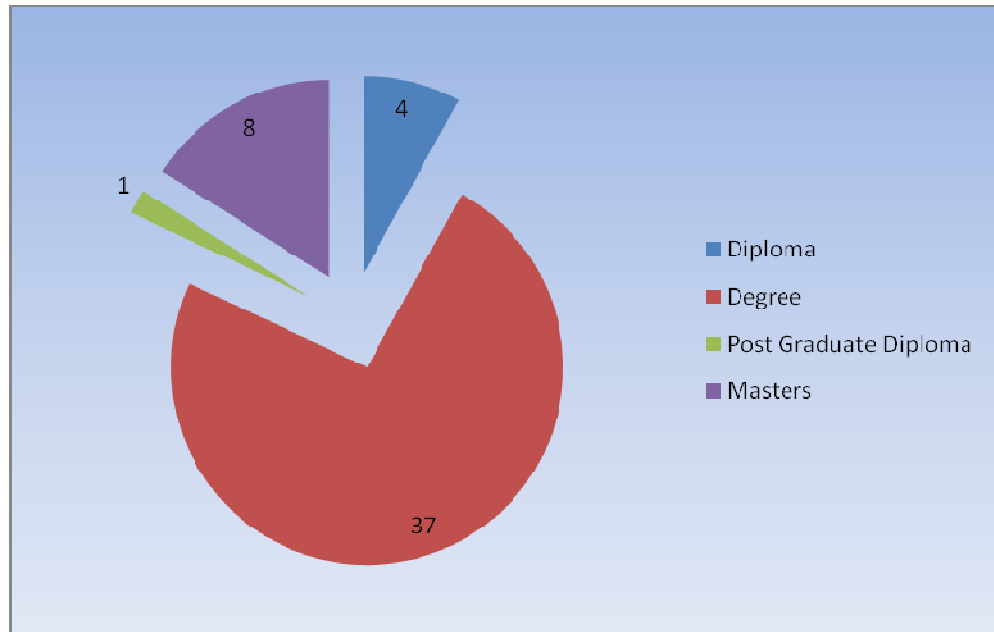
Figure 12: Respondents Years of service in the organization
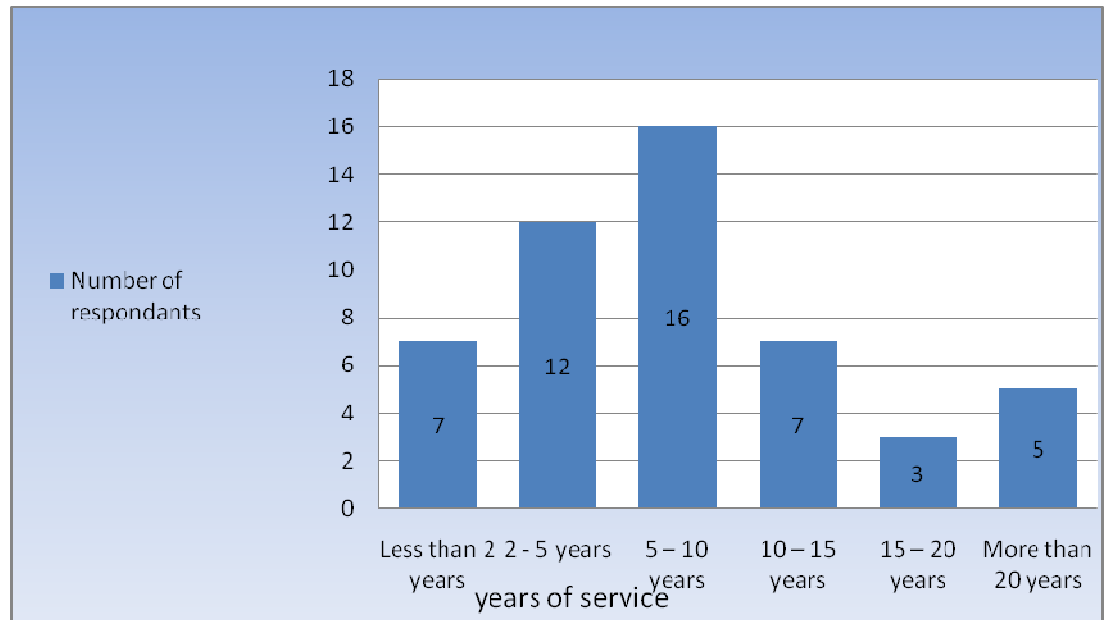
2.2.2. Respondents' Perception towards the Extent of Supply Chain Management Practices

The perception of respondents on each of the SCM practices described in view of strategic suppliers partnership, managing environmental issues, effective customer relationship and information communication customer services and competitive positioning.

A. Suppliers' Partnership (Independent Variable):

The respondents were asked about their practice of strategic supplier partnership as described into seven variables. These variables assess strategic suppliers partnership in terms of strong strategic partnership, supply base optimization, alignment and involvement of key suppliers in goal setting and planning, sharing of information among the critical suppliers, motivation and rewarding suppliers as well as problem sharing and solving mechanism and skills transfer among partners.

Table 7: Extent of Strategic Suppliers Partnership

Variables	Poor %	Satisfactory %	Undecided %	Good %	Excellent %	Mean	Std. deviation
Critical items suppliers are considered as strong strategic partners and key team member of the whole supply chain (n=49)	24.5	32.7	8.2	28.6	6	2.14	1.71
There is a supply base optimization process (determine how many suppliers needed for every critical items, identify the right suppliers and establish the right relationship) (n=49)	42.9	18.4	16.3	16.1	6.3	2.35	1.494
Key Suppliers are aligned with and allowed to be involved in company's goal setting and planning programs(n=49)	59.2	12.2	14.3	12.3	2	2	1.458

Important information are shared among the critical suppliers(n=49)	32.7	36.7	8.2	18.4	4	2.18	1.185
There are suppliers performance measurement systems(n=50)	50	22	12	12	4	2.06	1.376
The company motivates and rewards satisfactory suppliers(n=47)	63.8	6.4	-	12.8	17	1.83	1.204
There are well established trust, problem sharing solving mechanism and skills transfer among partners(n=47)	46.9	30.6	8.3	12.2	2	1.94	1.197

As presented in Table 7, it is understood that the mean values of the variables are between 1.83 and 2.35. More than half of the respondents (63.8%) disclosed that the companies' suppliers motivation and reward is poor; & about 59.2% disclosed that key suppliers' alignment and involvement in companies goal setting are poor. Supply chain management requires a close collaboration and integration of activities among different team members. Under this instance, the alignment of goals and cooperative planning among team members is essential. In order to align and appear as a winning team, members need to see vividly and be motivated in what brings them together. However, in the above figures, it seems that the major stakeholder in the supply chain process is neglected in the process of goal setting and planning. Moreover, due consideration is not given to motivate and reward them which in the end are essential to the attainment of the objective of the organization as well as the whole supply chain members.

B. Effective Customer Relationship (independent variable):

The respondents were asked about effective customer services and relationship issues as described into six variables. These variables assess the

company's involvement in customer need assessment, collection of feedback

from customers for improvements, new products and services development,

prompt filling of customer orders, provision of products information as well as

offering of technical assistance & training to users.

Table 8: Extent of Effective Customer Relationship (n = 50)

Variables	Poor %	Satisfactory %	Undecided %	Good %	Excellent %	Mean	Std. deviation
Starts from the requirement of the customer needs and accordingly plan, design and develop products and services.	40	16	8	30	6	2.26	1.275
Obtains feedback from customers and modify products and services to meet the requirement	34	22	6	32	6	2.28	1.179
Strives and launches new products and services to the customers	58	12	14	10	6	2.06	1.49
Fills customer orders as accurately and promptly as required	30	38	16	8	8	2.26	1.209
More and better products information are provided to customers	40	32	4	16	6	2.04	1.124
Technical assistance and trainings are offered to various users of the product	66	14	12	6	2	1.8	1.370

As presented in Table 8, it is understood that the mean values of the variables

are between 1.8 and 2.28. More than half of the respondents (66.6%)

disclosed that the companies' trend towards the provision of technical

assistance and training to various uses of the product are poor; and about

58% of the respondents stated that the companies' trend of striving and

launching new products and services to the customers are poor. Customer

relationship deals with identification of key customers, development and

implementation of different programs to secure the best levels of customer

satisfaction. Innovation and extended level of delivered services are crucial to secure the satisfaction of the ultimate customers. However, poor level of new product and services development as well as weak level of after sales services had an immense impact on the competitive position of organizations in this contemporary world.

C. Managing Environmental Issues (independent variable):

The respondents were asked about their practice of managing environmental issues as described into seven variables. These variables assess the company's environmental policy and programs, heat recovery mechanism, usage of renewable energy sources, protection of mining sites from deforestation and land degradation and use of recyclable packaging materials.

Table 9: Extent of Managing Environmental Issues

Variables	Poor %	Satisfactory %	Undecided %	Good %	Excellent %	Mean	Std. deviation
The organization has an environmental policy and programs (n=50)	22	44	6	26	2	2.26	1.026
The organization do have a well established heat recovery mechanism(n=49)	55.3	20.4	16	8.3	-	2.02	1.465
Substituting the nonrenewable energy sources (coal, oil, natural gas) with alternative energy sources (solar, wind, wastes etc) (n=49)	65.3	10.2	12.2	8.2	4.1	1.88	1.424
Protects the mining sites from deforestation and land degradation (n=50)	18	34	16	26	6	2.68	1.301
Protects pollution by instituting various dust emulsion control mechanisms(n=50)	20	34	6	32	8	2.46	1.092
Uses recyclable packaging(n=50)	54	14	8	16	8	2.02	1.332
Sources from green suppliers(n=47)	36.2	17	29.8	14.9	2.1	2.72	1.667

Table 9 depicts that the mean values of the variables are between 1.88 and 2.68. More than half of the respondents (65.3%) disclosed that the companies' way of substituting none renewable energy sources with alternative energy sources is poor; and about 55.3% stated that the companies' heat recovery mechanism is poorly installed. As discussed in the literature review, greening supply chain is gaining high due consideration. Those responses found poor under the above table are essential both for the company as well as for the environment. Substitution of non renewable energy with renewable energy conserves the non renewable energy for the future generation. In addition, it minimizes costs as it uses wastes and other renewable energy sources. In the mean time, implementation of these programs enables companies to gain different reimbursements from global carbon trading finances. Implementation of heat recovery programs enables companies to minimize their energy consumptions and hence it reduces the level of carbon emissions to the whole universe. Dwelling on these variables have a great impact on the competitive position of the organizations.

D. Effective Information Communications (independent variable):

The respondents were asked about information communication & its effectiveness as described into seven variables. These variables assess the company's IT investment, people's willingness & sharing of information, & use and application of online systems and alignment of information systems among supply chain members.

Table 10: Extent of Effective Information Communications

Variables	Poor %	Satisfactory %	Undecided %	Good %	Excellent %	Mean	Std. deviation
Invests in IT to connect the people both within the company as well as across the supply chain (n=50)	20	28	2	40	10	2.26	0.994
People are willing to use and share information within and across the supply chain (n=50).	24	30	18	26	2	2.6	1.37
Online connections (EDI, internets etc) are widely used within as well as across supply chain members (n=49)	38.8	28.6	6	18.4	8.2	2.14	1.208
Information regarding monitoring of orders, materials, schedules, inventories (ERP) (n=50)	40	32	8	18	2	2.06	1.185
Online information about customers are tracked (EPOS) (n=47)	61.7	23.4	4.3	8.5	2.1	1.64	1.031
Uses online systems to achieve operating efficiency (CAD, CAM etc) (n=48)	62.5	22.9	8.3	6.3	-	1.69	1.170
Works closely with SC members to align and solve basic information communication challenges (n=50)	40	42	8	6	4	1.98	1.169

The above table shows that the mean values of the variables are between 1.64 and 2.26. More than half of the respondents (62.5%) disclosed that the companies' online information systems to achieve operating efficiency are poor. Moreover, about 61.7% of the respondents stated that customers' online on line information tracking are poor.

Usage of appropriate information technology improves supply chain responsiveness, reduces cycle time, enable to achieve higher efficiency and facilitate the fastest delivery of products and services to the customers. The

information technology enabled various people, teams, functions and organizations to work together as a team along the supply chain. Accordingly, the relationships as facilitated by information technology have a great impact on information exchange which in the end enables to secure customer satisfaction and attain competitive advantage over the rival competitors.

E. Competitive Position of Cement industries in Ethiopia (dependent variable):

The respondents were asked about competitive position in five variables. These variables assess the company's position in offering low cost/price product, innovation of new products & services, quality products and sustainability.

Table 11: Responses about Competitive Position

Variables	Poor %	Satisfactory %	Undecided %	Good %	Excellent %	Mean	Std. deviation
Offers low cost/price product by attaining full capacity operations (n=50)	40	26	4	28	2	2.04	1.068
Is under constant innovation and delivers new products and services to the market (n=50)	54	18	8	18	2	1.92	1.243
Offers Quality product, value and services (n=49)	10.2	36.7	4.2	26.5	22.4	2.73	1.056
Do have many product variations, wide selections, extended services and attributes(n=49)	36.7	28.6	22.4	12.3	-	2.43	1.541
Develops energy conserving systems as well as environmentally friendly products(n=50)	28	38	6	24	4	2.22	1.093

As presented in Table 11, it is understood that the mean values of the variables are between 1.92 and 2.43. More than half of the respondents (54%) disclosed that the companies' competitive position is under poor state of constant innovation. They added that deliverance of new products and services to the market is also poor. In addition, about 40% of the respondents stated that the companies' ability to offer low/price products is poor. Competitive advantage is attained through the delivery of goods and services to customers in a way that it excels competitors and meeting and even going beyond the expectation of the customers. As observed from the perception of the respondents, majority of the respondents stated that companies are not providing low cost products, are not innovative, do not supply variety of products and are not working in a sustainable manner. Clearly, that these variables do have an impact on the competitive position of the Cement factories in Ethiopia.

2.3   Hypothesis Testing

The objective of this study are: (1) To make an awareness of the concept of supply chain management concept in the Ethiopian Cement Industry; (2) To make aware of the clear challenges of the Ethiopian Cement industry in their competitive positions within the era of globalization; (3) To promote the concept and application of supply chain management concept as a mechanism to deal with the competitiveness challenges in the Ethiopian Cement Industry; and (4)To analyze the current challenges in the supply chain management process and recommend solutions based on the finding of this

research. In this study the supply chain management practices (strategic Suppliers' partnership, management of environmental issues, Effective information communication & Effective customer relationship) were independent variables where as the five variables of competitive positioning (cost/price, innovation, quality, variation, and sustainability) are dependent variables. In order to address these questions, 4 hypotheses were developed and empirical data were collected from the respondents to either accept or reject the null hypothesis.

To test the hypotheses drawn, nonparametric tests were applied. The tests used were   Kendall's Tue & One Way ANOVA.

The **Kendall's Tue** is a non-parametrical test used for ordinal variables, which makes fewer assumptions about variables and preferable when two or more respondents are at the same rank (Alan & Cramer, 2009). This test was used to test the relationship, strength & direction of the relationship between the independent & dependent variables stated in the four hypotheses. As it's indicated in the descriptive output about respondents' perception of the extent of supply chain management practices in table 7, table 8, table 9, table 10 and table 11, there was some proportions to which the responses were tied-ranked for items in each variable list. Thus, for such kind of data Kendall's Tue test is preferable, because it is used to test the correlation of variables with tied – rank, than other non-parametric measures of correlation (Alan & Cramer, 2009).

One – way ANOVA is an inferential statistical method which is issued for comparing the means of one or more groups based on a classified independent variable in order to reduce the probability of type I error (Chris, 2004). This test was used to test the mean score of each independent variable against the dependent variable. It helps also to ascertain the correlation coefficient that results from the Kendall's Tue statistical test occurred not by chance, but by probability.

Testing Hypothesis 1

H_{o1}: There is no relationship between the strategic supplier's partnership and competitive positioning in Ethiopian Cement Industry.

Ha1: There is relationship between the strategic supplier's partnership and competitive positioning in Ethiopian Cement Industry.

Table 12: Matrix of   Kendall's tau correlation coefficients between Strategic
Suppliers' Partnership & Competitive position

			Suppliers Partnership	Competitive Position
Kendall's tau	Suppliers Partnership	Correlation Coefficient	1.000	.877[**]
		Sig. (2-tailed)	.	.000
		N	50	50
	Competitive Position	Correlation Coefficient	.877[**]	1.000
		Sig. (2-tailed)	.000	.
		N	50	50
**. Correlation is significant at the 0.01 level (2-tailed).				

The level of correlation in Table 12, between Strategic Suppliers' Partnership & Competitive position, shows 0.877 with a significant level (.000,which is much better than the conventional cut-off 0.05) suggesting that the relationship defiantly statistically significant. The evidence against Ho is strong. The correlation coefficient provides estimate of co-variance that the two variables were related at α =0.000 significant level (thus, reject Ho at α =0.000). Therefore, there was a modest positive relationship between the strategic suppliers' partnership and competitive positioning in Ethiopian Cement Industry.

Table 13: One-Way ANOVA: Comparing Strategic Supplier's partnership across competitive positioning.

ANOVA					
Competitive Positioning					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1474.070	21	70.194	217.174	.000
Within Groups	9.050	28	.323		
Total	1483.120	49			

The ANOVA–test showed that the mean score of strategic supplier's partnership and competitive positioning was the same at less than the conventional cut-off 0.05 levels (α =0.000) Thus, this ascertained that the correlation coefficient computed for strategic supplier's partnership against competitive positioning occurred not due to chance, but with significant level of probability. This means that the correlation among the two variables occurred by chance is very low.

Testing Hypothesis 2

H_{o2}: There is no relationship between effective customer relationship and competitive positioning in Ethiopian Cement Industry.

Ha2: There is relationship between effective customer services and competitive positioning in Ethiopian Cement Industry.

Table14: Matrix of   Kendall's tau correlation coefficients between effective customer services & competitive position

			Competitive Position	Effective customer services
Kendall's tau	Competitive Position	Correlation Coefficient	1.000	.923[**]
		Sig. (2-tailed)	.	.000
		N	50	50
	Effective customer services	Correlation Coefficient	.923[**]	1.000
		Sig. (2-tailed)	.000	.
		N	50	50

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

The level of correlation in Table 14, between effective customer relationship and Competitive position, shows 0.923 with a significant level (.000, which is much better than the conventional cut-off 0.05), suggesting that the relationship defiantly statistically significant. The evidence against Ho is strong. The correlation coefficient provides estimate of co-variance that the two variables were related at α =0.000 significant level (thus, reject Ho at α =0.000).   Therefore, there is a strong positive relationship between the effective customer relationship and competitive positioning in Ethiopian Cement Industry.

Table 15: A One-Way ANOVA: comparing Effective Customer Relationship across competitive positioning.

ANOVA					
Competitive Positioning					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1417.270	16	88.579	44.391	.000
Within Groups	65.850	33	1.995		
Total	1483.120	49			

The ANOVA-test showed that the mean score of effective customer relationship and competitive positioning is the same at less than the conventional cut-off 0.05 levels (α =0.000) Thus, this ascertained that the correlation coefficient computed for effective customer relationship against competitive positioning occurred not due to chance, but with significant level of probability. This implies that the correlation among the two variables occurred by chance is very low.

Testing Hypothesis 3

Ho3: There is no relationship between managing environmental issues and competitive positioning in Ethiopian Cement Industry.

Ha3: There is relationship between managing environmental issues and competitive positioning in Ethiopian Cement Industry.

The level of correlation in Table 16 below, between managing environmental issues & competitive position, shows 0.931 with a significant level (.000, which is much better than the conventional cut-off 0.05) suggesting that the

relationship defiantly statistically significant. The evidence against Ho is strong. The correlation coefficient provides estimate of co-variance that the two variables were related at α =0.000 significant level (thus, reject Ho at α =0.000). Therefore, there is a strong positive relationship between the managing environmental issues and competitive positioning in Ethiopian Cement Industry.

Table 16: Matrix of Kendall's tau correlation coefficients between managing environmental issues & competitive position

			Managing Environmental issues	Competitive Position
Kendall's tau	Managing Environmental issues	Correlation Coefficient	1.000	.931[**]
		Sig. (2-tailed)	.	.000
		N	50	50
	Competitive Position	Correlation Coefficient	.931[**]	1.000
		Sig. (2-tailed)	.000	.
		N	50	50

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

The calculated chi-square values for all the seven variables listed under Managing Environmental issues are less than the conventional cut-off 0.05 level. This indicates that the probability that the relationship between the observed and expected frequencies.

Table 17: A One-Way ANOVA: comparing Managing Environmental Issues across competitive positioning.

ANOVA					
Competitive Positioning					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1463.564	17	86.092	140.878	.000
Within Groups	19.556	32	.611		
Total	1483.120	49			

The ANOVA – test showed that the mean score of managing environmental issues and competitive positioning is the same at less than the conventional cut-off 0.05 levels (α =0.000) Thus, this ascertained that the correlation coefficient computed for managing environmental issues against competitive positioning occurred not due to chance, but with significant level of probability. This means that the correlation among the two variables occurring by chance is very low.

Testing Hypothesis 4

Ho4: There is no relationship between effective information communication and   competitive positioning in Ethiopian Cement Industry.

Ha4: There is relationship between effective information communication and competitive positioning in Ethiopian Cement Industry.

Table 18: Matrix of   Kendall's tau correlation coefficients between effective

information communication systems & competitive position

			Competitive Position	information communication systems
Kendall's tau	Competitive Position	Correlation Coefficient	1.000	.935**
		Sig. (2-tailed)	.	.000
		N	50	50
	information communicatio n systems	Correlation Coefficient	.935**	1.000
		Sig. (2-tailed)	.000	.
		N	50	50

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

The level of correlation in Table 18, between effective information communication & Competitive position, shows 0.935 with a significant level (.000, which is much better than the conventional cut-off 0.05) suggesting that the relationship defiantly statistically significant. The evidence against Ho is strong. The correlation coefficient provides estimate of co-variance that the two variables are related at α =0.000 significant level (thus, reject Ho at α =0.000). Therefore, there is a strong positive relationship between the effective information communication systems and competitive positioning in Ethiopian Cement Industry.

Table 19: A One-Way ANOVA: comparing Effective Information Communication across competitive positioning.

ANOVA					
Competitive Positioning					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1417.180	16	88.574	44.327	.000
Within Groups	65.940	33	1.998		
Total	1483.120	49			

The ANOVA-test shows that the mean score of effective communication information and competitive positioning is the same as the conventional cut-off 0.05 levels (α =0.000). Thus, this ascertained that the correlation coefficient computed for effective communication information against competitive positioning occurred not due to chance, but with significant level of probability. This means that the correlation among the two variables occurred by chance is very low.

Table 20: Summary matrix of Kendall's tau correlation coefficients between the four independent variables - Strategic Suppliers' Partnership, Effective Customer Relationships, Managing Environmental Issues & Effective Information Communication & competitive position

			Strategic Suppliers' Partnership	Effective Customer Relationship	Managing Environmental Issues	Effective Information Communication
Kendall's tau	Competitive Positioning	Correlation Coefficient	.877[**]	.923[**]	.931[**]	.935
		Sig. (2-tailed)	.000	.000	.000	.00
		N	50	50	50	5

Table 21: Summary of Hypothesis testing

	Null hypothesis	Result
Ho1	There is no relationship between the strategic suppliers' partnership and competitive position in Ethiopian Cement Industry.	Rejected
Ho2	There is no relationship between effective customer relationship and competitive position in Ethiopian Cement Industry.	Rejected
Ho3	There is no relationship between managing environmental issues and competitive position in Ethiopian Cement Industry.	Rejected
Ho4	There is no relationship between effective information communication and competitive position in Ethiopian Cement Industry.	Rejected

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

In the preceding chapters, data were analyzed based on the summary of descriptive analysis and hypothesis testing. The findings would be discussed and their relationship with the research problems would be analyzed and accordingly conclusion and recommendations would be drawn in a way that it would develop awareness among the stakeholders. As the matter may not be well done in the Ethiopian Cement Industries, the researcher points the direction for the future research.

1. Discussion on the findings of the research

Cement is a homogenous product where cost differentiation is the main strategic issue to secure competitive advantage in the market. Cost minimization could be attained in maximizing the economies of scales in process of production and conserving the type and level of energy consumption which accounts the major cost component in the industry. Most of the factories in Ethiopia are using fossil fuel in the process of their calcinations where it is both costly and none environmentally friendly.

In the past few years demand were exceeding supply and customers were supposed to wait to the long queue lists before they got cement. This has created producers complacency as they could sell their products at wished prices leading them to be not as such customer focused. On the other hand,

customers are feeling so much dissatisfied on the current non availability and when the possibility comes; they may switch to the new entrants due to the prior developed hatred.

Sharing critical information is vital to reduce the level of inventory and costs while delivering improved performance level within the supply chain levels. As discussed above in the literature review, the information technology and connectivity in Ethiopia has not developed yet.

As it is also mentioned in the previous chapters, the lucrative profits currently gained in the industry, visible demand and supply gaps in the coming years and governments relentless effort to attract local and global firms, the oligopoly nature of competition never lasts longer. Today is the era of globalization where other multinationals also would join soon the current Ethiopian Cement market. Therefore, the researcher has identified mainly the general supply chain management challenges and analyzed their relationship with the competitive position of Cement industry in Ethiopia.

Accordingly the following research questions were forwarded for further analysis:

- What is the relationship between Strategic Suppliers' Partnerships with the competitive position of the Cement Industry in Ethiopia?

- What is the relationship between Customer Relationships and the competitive position of Cement Industry in Ethiopia?

- What is the relationship between Environmental Issues and the competitive position of Cement Industry in Ethiopia?

- What is the relationship between Information Communication and the competitive position of Cement Industry in Ethiopia?

1.1. Suppliers Partnership and Competitive position in Ethiopian Cement Industry:

Strategic suppliers partnership was assessed in terms of strong key suppliers strategic partnership, supply base optimization, alignment and involvement of key suppliers in goal setting and planning, sharing of information among the critical suppliers, motivation and rewarding suppliers as well as problem sharing & solving mechanism and skills transfer among partners.

Mainly, the involvement of suppliers in the goal setting and planning phase as well as motivation and rewarding of suppliers got the highest poor scores. Other variables are also not as such good enough. As indicated by Fawcett et al (2007), working with selected few strategic suppliers would enhance collaborations among partners that have an impact on responsiveness, quality and costs. These factors have an impact on the competitive position of Cement factories in Ethiopia.

As shown in the statistical hypothesis testing, the level of correlation between strategic supplier's partnership and competitive position is found to be 0.877 with a significant level of 0.05, which suggests their relationship is significant. Therefore, the first null hypothesis stated as "There is no relationship between

the strategic suppliers' partnership and competitive position in Ethiopian Cement Industry" is rejected and companies need to give due consideration for strategic suppliers partnership to sustain the upcoming competitive conditions.

1.2 Customer Relationship and Competitive position in Ethiopian Cement Industry:

Business exists for make profit. Profit can only attained through a sustainable customer satisfaction. This process requires a customer focused and uninterrupted relationship. The very essence of SCM is pull system that starts from the customers. The relationships with the customers shall be managed in such a way that the efforts are systematically integrated with the organization as well as with the supply chain members. This management process is a process of identifying key customers, communication, development and implementation of different programs to secure the best level of customers' satisfaction. As it can be seen under table 8, the majority of the respondents answered that the variables mentioned under customer relationship are poor.

A company should establish facts about its customers, and offers need based and defined services. Though cement is considered as a homogenous product, there could be various values and service attributable to customers. Dependable information and various assistances are the after sales part which would attract, satisfy and retain customers for firms to last in a sustainable and competitive position.

As shown in table 14, in the statistical hypothesis testing, the level of correlation between strategic customer relationship and competitive position is found to be 0.923 with a significant level of 0.05, which suggests that their relationship is highly significant. Therefore, the second null hypothesis which is stated as "There is no relationship between effective customer relationship and competitive positioning in Ethiopian Cement Industry" is rejected. Companies need to give due consideration for uninterrupted customer relationships to sustain their upcoming competitive conditions.

1.3 **Environmental Issues and Competitive Position in Ethiopian Cement Industry:**

Firms work in an environment receiving different inputs and delivering output in return. Moreover, they are expected to abide by the laws and norms of the society. In the supply chain management, the concept of green supply chain is getting a new momentum. Green supply chain management, as defined previously, is an inclusion of environmental issues in the process of sourcing, design, production, distribution as well as end of life time disposal.

In this particular case, the existence of environmental policy, energy savings and usage of renewable energy sources, environmental pollution and degradation protection, usage of recyclable packages as well as inclinations towards sourcing from green suppliers were examined.

Among these variables, as it contended by the majority of the respondents, the existence of heat recovery mechanism, utilization of renewable energy sources and usage of recyclable packing materials are found to be in poor

condition. Weak handlings of the environmental issues have a great implication on cost, reputation and on the overall competitive position of the organizations.

Table 16 also shows, in the statistical hypothesis testing. The level of correlation between strategic environmental issues and competitive position is found to be 0.931 with a significant level of 0.05, which suggests that their relationship is highly significant. Therefore, the third null hypothesis that states as "There is no relationship between environmental issues and competitive positioning in Ethiopian Cement Industry" is rejected. Therefore companies need to give a due consideration for sustainability to stay in a competitive position.

1.4 **Information Communication and Competitive position in Ethiopian Cement Industry:**

As discussed in the literature review, IT improves supply chain agility, reduce cycle time, enable higher level of efficiency and timely deliver goods and services to the customer. It requires uniform and compatible information technology investments and applications among the supply chain members. The connectivity alone does not bring what is required. There shall be a well established trust and willingness among the users of the technology. Online infrastructures also be well designed and implemented so that chain members can transfer and share information among themselves.

As shown in table 10, interconnected information communication and online monitoring, IT aided design and production, customers tracking are found to be 40%, 61.7% and 62.5%, respectively in poor condition. This poor information communication do have an impact on the cycle time, level of efficiency and delivering goods and services to the customer.

In the statistical hypothesis testing (Table 18), the level of correlation between information communication and competitive position is found to be 0.935 with a significant level of 0.05. This suggests that their relationship is highly significant. Therefore, the fourth null hypothesis that states as "There is no relationship between information communication and competitive positioning in Ethiopian Cement Industry" is rejected. Companies need to give due consideration for the infrastructure development, and trust building among themselves to develop and share information so that they will be in a competitive position in the end.

2. Conclusion and Recommendations

According to the four general challenges of supply chain management and each classified different variables, one can say that the practices of supply chain management Ethiopian Cement industry are almost poor. In addition, according to the informal discussion made between the researcher and some of the respondents, the respondents contended that current demand and supply make them complacent.

However, the numbers of cement factories are increasing at an alarming rate and some of the entrants are multinational companies having huge capital as well as long years of technical and managerial experiences in the industry.

As it is shown in the descriptive statistics and hypothesis testing, the supply chain management practices as categorized under different issues show that the level of the practices are at their lower level. The impacts of these variables on the competitive position of cement factories are highly significant. To proactively avert the challenge of these variables on the competitive position of Ethiopian Cement firm, the researcher recommends the followings.

1.   Cement Factories in Ethiopia need to change their usual transactional suppliers' relationship with strategic supplier partnership. This requires the identification and follows up of critical suppliers; they should be invited to be involved in the phase of organization planning. There should also be a suppliers performance measurement schemes with which they are going to be motivated and rewarded. Together, they should develop a joint team that facilitate trust among partners, solve potential harms that may be created within or across the border.

2.   Cement factories need to understand that they are there not only to sell cements but to serve them. An organization never exists if there are no customers. The very existence of every organization is to satisfy the customers to attain the very purpose of profitability. As discussed in the literature review, these days, cement market is supply driven and this lead manufacturer not to be worried about cost, quality, services and diversity.

Due to the era of globalization, no market is secured from intrusion. As time comes for the competition, dissatisfied customers would retaliate by migrating to the new better suppliers. Therefore, firms need to identify the need of the customers, collect feedbacks on any complaints and avail different products and service attributes to their customers.

3.   Organizations should consider environmental issues as a competitive necessity instead of not only regulatory obligations. Dust and carbon emission reductions, land conservations and other environmental issues enhance the competitive position of cement firms if they are proactively managed. Proper containing of dusts that could be saved and turned into production output, instead of being a threat to the environment pollution. Carbon trading is another source of income for the industry by launching different programs like usage of renewable energy sources. Municipal wastes are damped at the outskirt of around Addis Ababa where it would be used as an alternate energy source. It saves energy cost, clean the municipal waste damping area and in the mean time generate income through carbon trading. Therefore, Cement factories in Ethiopia should form a strong executive committee that generate ideas, transform and follow up different environmental programs.

4.   Information technology should be instituted to foster information communication within and among all supply chain members. Connectivity should start from customers through the organizations to the suppliers. Online information gathering and sharing should be designed based on mutual trust

and purposes. Technologies also have to be compatible enough along the supply chain members to smoothen the flow and understandings along the networked lines.

3. Direction for future research

Due to time and resource constraints, the researcher did not incorporate the upstream suppliers and downstream customers. Various secondary data sources were not used to validate the responses. It only depends on responses based on the perception of the selected respondents. However, the researcher believes that it could be seen as a spring board for future similar researches.

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Appendex 1 Questioner

To: -------------------------------------
Addis Ababa/_____

Dear Sir/Madam,

My name is Belay Mengistu Demisse, a final year student of Masters of Business Leadership (MBL) at University of South Africa (UNISA).

For the fulfillment of my last research report, I have chosen a title called **"CHALLENGES OF SUPPLY CHAIN MANAGEMENT AND THEIR RELATIONSHIP BETWEEN THE COMPETITIVE POSITION OF CEMENT INDUSTRY IN ETHIOPIA."**

Global Supply Chain Forum has defined supply chain management as an integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders. The very essence of supply chain management is satisfaction of the customers. The commitment and integration of the processes starting from the source of the materials up to the delivery of goods and services to the customers and done in such a way that it adds more value, strategically integrated and coordinated towards meeting to the best level of the satisfaction of the final consumers. Properly management of supply chain would result in lowering costs, short delivery time, low inventory level and improve reliability which are all would improve the competitive position of the organization.

Cement industry in Ethiopia, especially at least for the past 8 years, was owned by only few cement factories where all were able to sale whatever quantity they produces at price level they set for, had the government did not involve in the system. Costs were not a basis for competition and customer services were also not as such an issue. However, due to the lucrative profits currently gained in the industry, visible demand and supply gaps in the coming years and governments a relentless effort to attract local and global firms, the oligopoly nature of competition would not last in a sustained manner.

Accordingly, firms need beforehand to identify the major supply chain management challenges that may exist in the industry. Different researchers and practitioners have identified major

supply chain management issues as supply chain integration and strategic partnering, poor coordination of efforts, incompatible information systems, long cycle times, communication problems, customer service issues, excessive waste and environmental degradation, relatively high inventory and lower than optimal profits. For this particular case the researcher has chosen the general problems that are crossing other multiple specific problems and multiple supply chain processes. These issues are partnership with the suppliers, information communication, managing the environmental issues and customer services issues.

First and foremost the researcher believes that this study would contribute to the well understanding of the supply chain management concepts and the future challenges that may soon come in the oligopoly structured of the Ethiopian cement industry. Therefore I hereby would like to request you voluntarily take some of you valuable times and assist my research project by filling the attached questioner. I roughly estimated that it would take you less than 30 minutes to fill this questioner. In the meantime I would like to assure you that the responses you gave would remain confidential and anonymous. If you are interested enough to get the copy of the executive summary of this research please put a remark on your return questioner so that I may send you the same. If you do have any questions or concerns about the study please do not hesitate to forward it at the addresses mentioned below.

With my best regards,

Belay Mengistu Demisse
Cell phone: 0911 515456
Email: belaymeng2005@yahoo.com, 72191368@mylife.unisa.ac.za
P.O. Box: 122327, Addis Ababa, Ethiopia

General instructions and information for filling the questioner

1. Likert scales are used to indicate your measurement on the level of the organization's supply chain management practices and their impacts on its competitive position.

2. Please answer all questions by **CIRCLING ONLY ONE BEST ANSWER** from the numbers at each row under each tables.

3. The numbers in the table represents as follows.

   3.1   Number **1** represents **POOR**

   3.2   Number **2** represents **SATISFACTORY**

   3.3   Number **3** represents **UNDECIDED**

   3.4   Number **4** represents **GOOD**

   3.5   Number **5** represents **EXCELLENT**

4. If you do have any further comment or any remarks, please do not hesitate to write it down at the spaces designated below each tables. If you find it not enough to write you can attach them by writing them on a separate sheet of paper.

QUESTIONER

1. Suppliers' partnership:

Suppliers are the main source of inputs to the organization. Suppliers' partnership is a formation of long term relationship with few dedicated and reliable suppliers. Strategically companies can work either with few critical suppliers or many suppliers. Though, either of them could depend on the technological sophistication of the items, the nature of the market, capabilities of suppliers etc, there are greater bases of argument that working in close partnership with dependable suppliers would lower cost and inventory level, shorten delivery time and improve reliability.

No.	SCM Practices	The level of supply chain management practices				
		Poor	Satisfactory	undecided	Good	Excellent
1	Critical items suppliers are considered as strong strategic partners and key team member of the whole supply chain.	1	2	3	4	5
2	There is a supply base optimization process (determine how many suppliers needed for every critical items, identify the right suppliers and establish the right relationship)	1	2	3	4	5
3	Key Suppliers are aligned with and allowed to be involved in company's goal setting and planning programs	1	2	3	4	5
4	Important information are shared among the critical suppliers	1	2	3	4	5
5	There are suppliers performance measurement systems	1	2	3	4	5
6	The company motivates and rewards satisfactory suppliers	1	2	3	4	5
7	There are well established trust, problem sharing solving mechanism and skills transfer among partners	1	2	3	4	5

Other remarks

_____

_____

_____

2. Customers relationship

Firms that have a strong customer focus do have a close contact with their customers where it all brings them to deliver higher level of customer satisfaction. The very objective of business is profitability. Profitability can only be attained in meeting to the best level of customer satisfaction. Supply chain management integrates the whole supply chain teams where in the end to secure customer satisfaction. The very essence of SCM is pull system that starts from the customers. The relationships with the customers shall be managed in such a way that the efforts be systematically integrated among the supply chain team members. Customer relationship management is the process of identifying key customers, communicating with, development and implementation of different programs to secure the best level of satisfaction of the customers.

No.	SCM Practices	The level of supply chain management practices				
		Poor	Satisfactory	undecided	Good	Excellent
1	Starts from the requirement of the customer needs and accordingly plan, design and develop products and services.	1	2	3	4	5
2	Obtains feedback from customers and modify products and services to meet the requirement	1	2	3	4	5
3	Strives and launches new products and services to the customers	1	2	3	4	5
4	Fills customer orders as accurately and promptly as required	1	2	3	4	5
5	More and better products information are provided to customers	1	2	3	4	5
6	Technical assistance and trainings are offered to various users of the product	1	2	3	4	5

Other remarks:

_____
_____
_____
_____

3. Environmental issues:

Companies are working within an environment. Their decisions have great impact on the society. Therefore, they are accounted for what they brought for. Due to deterioration of the environment, researchers and practitioners began to promote the concept of green supply chain management (GrSCM). It is an integration of environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the customers as well as end of life management of the product after its useful life. Greener and most sustainable supply chain is not only good for the environment, but for the business. Firms are doing it not only because the market is demanding it but also it is becoming a competitive necessity.

No.	SCM Practices	The level of supply chain management practices				
		Poor	Satisfactory	undecided	Good	Excellent
1	The organization has an environmental policy and programs	1	2	3	4	5
2	The organization do have a well established heat recovery mechanism	1	2	3	4	5
3	Substituting the nonrenewable energy sources (coal, oil, natural gas) with alternative energy sources (solar, wind, wastes etc)	1	2	3	4	5
4	Protects the mining sites from deforestation and land degradation	1	2	3	4	5
5	Protects pollution by instituting various dust emulsion control mechanisms	1	2	3	4	5
6	Uses recyclable packaging	1	2	3	4	5
7	Sources from green suppliers	1	2	3	4	5

Other remarks

_____
_____
_____

4. Information communication

These days information is not only a resource. But it is a main resource of securing a competitive advantage in coordinating the within and across organizations activities. Information and information technology enabled to exchange information instantly with a least cost. Usage of appropriate information technology would improve supply chain responsiveness, reduce cycle time, enable to achieve higher efficiency and facilitate the delivery of products to the customers. This technology enabled various people, teams, functions and organizations to work together as a team along the supply chain. These relationships and the impact of information exchange secure customer satisfaction and competitive advantage.

. No.	SCM Practices	The level of supply chain management practices				
		Poor	Satisfactory	undecided	Good	Excellent
1	Invests in IT to connect the people both within the company as well as across the supply chain.	1	2	3	4	5
2	People are willing to use and share information within and across the supply chain.	1	2	3	4	5
3	Online connections (EDI, internets etc) are widely used within as well as across supply chain members	1	2	3	4	5
4	Information regarding monitoring of orders, materials, schedules, inventories (ERP)	1	2	3	4	5
5	Online information about customers are tracked (EPOS)	1	2	3	4	5
6	Uses online systems to achieve operating efficiency (CAD, CAM etc)	1	2	3	4	5
7	Works closely with SC members to align and solve basic information communication challenges	1	2	3	4	5

SC – supply chain, EDI – Electronic data interchange, ERP – Enterprise resource planning, EPOS – Electronic point of sales, CAD – Computer aided design, CAM - Computer aided manufacturing

Other remarks

_____
_____
_____

5. Competitive position

As a management tool SCM would strive for scanning the environment, plan along with the forward and backward stakeholders, design proper strategies that would enable the team to win sustained competitive advantages over their counterpart rivals. Improvement in management of supply chain would result in lowering costs, short delivery time, low inventory level and improve reliability which are all would improve the competitive position of the organization.

No.	Competitive advantages	The extent of company Competitive positions				
		Poor	Satisfactory	undecided	Good	Excellent
1	Offers low cost/price product by attaining full capacity operations	1	2	3	4	5
2	Is under constant innovation and delivers new products and services to the market	1	2	3	4	5
3	Offers Quality product, value and services	1	2	3	4	5
4	Do have many product variations, wide selections, extended services and attributes	1	2	3	4	5
5	Develops energy conserving systems as well as environmentally friendly products	1	2	3	4	5

Other remarks:

_____
_____
_____
_____

Demographic Information

1. Your position in the company (please put √ at the corresponding answer)

_____ Owner	_____ Board of director
_____ General Manager	_____ Deputy General Manager
_____ Commercial Manager	_____ Quarry Manager
_____ Technical Manager	_____ Mechanical Division Head
_____ Finance Manager	_____ Electrical Division Head
_____ Marketing Manager	_____ Customer services D/ Head
_____ Supply Manager	_____ Purchasing division Head
_____ Production Manager	_____Operations division Head
_____Quality controller	_____ Logistics division head
_____ IT Manager	_____ Sales Division Head

2. Level of education (please put √ at the corresponding answer)

_____ Below diploma	_____ Diploma
_____ Degree	_____ Post graduate diploma
_____ Masters	_____ PHD

3. Years of services within the company (please put √ at the corresponding answer)

_____ Less than 2 years	_____ 2-5 years
_____5 -10 years	_____ 10-15 years
_____ 15-20 years	_____ more than 20 years

4. Types of products produces within the company _____

5. Number of Employees within the organization (please put √ at the corresponding answer)

_____ Less than 100	_____ 51 -150
_____ 151 -250	_____ 251 – 500
_____ 501 -1000	_____ more than 1000

6. Two years average annual sales in Birr _____

7. Two years average annual profit in Birr _____

ONCE AGAIN I THANK YOU A LOT!!

Appendix 2

Statistics

1. Strategic Suppliers partnership

1.1 Critical items suppliers are considered as strong strategic partners and key team member of the whole supply chain.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	**12**	**24.0**	**24.5**	**24.5**
	Satisfactory	**16**	**32.0**	**32.7**	**57.1**
	Good	**14**	**28.0**	**28.6**	**85.7**
	Excellent	**3**	**6.0**	**6.1**	**91.8**
	Undecided	**4**	**8.0**	**8.2**	**100.0**
	Total	**49**	**98.0**	**100.0**	
Missing	Missed	**1**	**2.0**		
Total		**50**	**100.0**		

1.2 There is a supply base optimization process (determine how many suppliers needed for every critical items, identify the right suppliers and establish the right relationship)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	21	42.0	42.9	42.9
	Satisfactory	9	18.0	18.4	61.2
	Good	8	16.0	16.3	77.6
	Excellent	3	6.0	6.1	83.7
	Undecided	8	16.0	16.3	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

1.3 Key Suppliers are aligned with and allowed to be involved in company's goal setting and planning programs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	29	58.0	59.2	59.2
	Satisfactory	6	12.0	12.2	71.4
	Good	6	12.0	12.2	83.7
	Excellent	1	2.0	2.0	85.7
	Undecided	7	14.0	14.3	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

1.4 Important information are shared among the critical suppliers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	16	32.0	32.7	32.7
	Satisfactory	18	36.0	36.7	69.4
	Good	9	18.0	18.4	87.8
	Excellent	2	4.0	4.1	91.8
	Undecided	4	8.0	8.2	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

1.5 There are suppliers performance measurement systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	25	50.0	50.0	50.0
	Satisfactory	11	22.0	22.0	72.0
	Good	6	12.0	12.0	84.0
	Excellent	2	4.0	4.0	88.0
	Undecided	6	12.0	12.0	100.0
	Total	50	100.0	100.0	

1.6 The company motivates and rewards satisfactory suppliers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	30	60.0	63.8	63.8
	Satisfactory	3	6.0	6.4	70.2
	Good	6	12.0	12.8	83.0
	Excellent	8	16.0	17.0	100.0
	Total	47	94.0	100.0	
Missing	Missed	3	6.0		
Total		50	100.0		

1.7 There are well established trust, problem sharing solving mechanism and skills transfer among partners

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	23	46.0	46.9	46.9
	Satisfactory	15	30.0	30.6	77.6
	Good	6	12.0	12.2	89.8
	Excellent	1	2.0	2.0	91.8
	Undecided	4	8.0	8.2	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

Case Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Strategic Suppliers Partnership[a]	50	100.0%	0	.0%	50	100.0%

a. Group

Strategic suppliers partnership Frequencies

		Responses		Percent of Cases
		N	Percent	
Suppliers Partnership [a]	Poor	156	45.6%	312.0%
	Satisfactory	78	22.8%	156.0%
	Good	55	16.1%	110.0%
	Excellent	20	5.8%	40.0%
	Undecided	33	9.6%	66.0%
Total		342	100.0%	684.0%

a. Group

2. Customer Relationship

2.1 Starts from the requirement of the customer needs and accordingly plan, design and develop products and services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	20	40.0	40.0	40.0
	Satisfactory	8	16.0	16.0	56.0
	Good	15	30.0	30.0	86.0
	Excellent	3	6.0	6.0	92.0
	Undecided	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

2.2 Obtains feedback from customers and modify products and services to meet the requirement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	17	34.0	34.0	34.0
	Satisfactory	11	22.0	22.0	56.0
	Good	16	32.0	32.0	88.0
	Excellent	3	6.0	6.0	94.0
	Undecided	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

2.3 Strives and launches new products and services to the customers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	29	58.0	58.0	58.0
	Satisfactory	6	12.0	12.0	70.0
	Good	5	10.0	10.0	80.0
	Excellent	3	6.0	6.0	86.0
	Undecided	7	14.0	14.0	100.0
	Total	50	100.0	100.0	

2.4 Fills customer orders as accurately and promptly as required

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	15	30.0	30.0	30.0
	Satisfactory	19	38.0	38.0	68.0
	Good	8	16.0	16.0	84.0
	Excellent	4	8.0	8.0	92.0
	Undecided	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

2.5 More and better products information are provided to customers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	20	40.0	40.0	40.0
	Satisfactory	16	32.0	32.0	72.0
	Good	8	16.0	16.0	88.0
	Excellent	4	8.0	8.0	96.0
	Undecided	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

2.6 Technical assistance and trainings are offered to various users of the product

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	33	66.0	66.0	66.0
	Satisfactory	7	14.0	14.0	80.0
	Good	3	6.0	6.0	86.0
	Excellent	1	2.0	2.0	88.0
	Undecided	6	12.0	12.0	100.0
	Total	50	100.0	100.0	

Case Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Customers Relationship [a]	50	100.0%	0	.0%	50	100.0%

a. Group

Customers Relationship Frequencies

		Responses		Percent of Cases
		N	Percent	
Customers Relationship [a]	Poor	134	44.7%	268.0%
	Satisfactory	67	22.3%	134.0%
	Good	55	18.3%	110.0%
	Excellent	18	6.0%	36.0%
	Undecided	26	8.7%	52.0%
Total		300	100.0%	600.0%

a. Group

3. Environmental Issues

3.1 The organization has an environmental policy and programs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	11	22.0	22.0	22.0
	Satisfactory	22	44.0	44.0	66.0
	Good	13	26.0	26.0	92.0
	Excellent	1	2.0	2.0	94.0
	Undecided	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

3.2 The organization do have a well established heat recovery mechanism

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	27	54.0	55.1	55.1
	Satisfactory	10	20.0	20.4	75.5
	Good	4	8.0	8.2	83.7
	Undecided	8	16.0	16.3	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

3.3 Substituting the nonrenewable energy sources (coal, oil, natural gas) with alternative energy sources (solar, wind, wastes etc)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	32	64.0	65.3	65.3
	Satisfactory	5	10.0	10.2	75.5
	Good	4	8.0	8.2	83.7
	Excellent	2	4.0	4.1	87.8
	Undecided	6	12.0	12.2	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

3.4 Protects the mining sites from deforestation and land degradation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	9	18.0	18.0	18.0
	Satisfactory	17	34.0	34.0	52.0
	Good	13	26.0	26.0	78.0
	Excellent	3	6.0	6.0	84.0
	Undecided	8	16.0	16.0	100.0
	Total	50	100.0	100.0	

3.5 Protects pollution by instituting various dust emulsion control mechanisms

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	10	20.0	20.0	20.0
	Satisfactory	17	34.0	34.0	54.0
	Good	16	32.0	32.0	86.0
	Excellent	4	8.0	8.0	94.0
	Undecided	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

3.6 Uses recyclable packaging

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	27	54.0	54.0	54.0
	Satisfactory	7	14.0	14.0	68.0
	Good	8	16.0	16.0	84.0
	Excellent	4	8.0	8.0	92.0
	Undecided	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

3.7 Sources from green suppliers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	17	34.0	36.2	36.2
	Satisfactory	8	16.0	17.0	53.2
	Good	7	14.0	14.9	68.1
	Excellent	1	2.0	2.1	70.2
	Undecided	14	28.0	29.8	100.0
	Total	47	94.0	100.0	
Missing	Missed	3	6.0		
Total		50	100.0		

Case Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Environmental Issues [a]	50	100.0%	0	.0%	50	100.0%

a. Group

Environmental Issues Frequencies

		Responses		Percent of Cases
		N	Percent	
Environmental Issues [a]	Poor	133	38.6%	266.0%
	Satisfactory	86	24.9%	172.0%
	Good	65	18.8%	130.0%
	Excellent	15	4.3%	30.0%
	Undecided	46	13.3%	92.0%
Total		345	100.0%	690.0%

a. Group

4. Information Communication

4.1 Invests in IT to connect the people both within the company as well as across the supply chain.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	10	20.0	20.0	20.0
	Satisfactory	14	28.0	28.0	48.0
	Good	20	40.0	40.0	88.0
	Excellent	5	10.0	10.0	98.0
	Undecided	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

4.2 People are willing to use and share information within and across the supply chain.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	12	24.0	24.0	24.0
	Satisfactory	15	30.0	30.0	54.0
	Good	13	26.0	26.0	80.0
	Excellent	1	2.0	2.0	82.0
	Undecided	9	18.0	18.0	100.0
	Total	50	100.0	100.0	

4.3 Online connections (EDI, internets etc) are widely used within as well as across supply chain members

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	19	38.0	38.8	38.8
	Satisfactory	14	28.0	28.6	67.3
	Good	9	18.0	18.4	85.7
	Excellent	4	8.0	8.2	93.9
	Undecided	3	6.0	6.1	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

4.4 Information regarding monitoring of orders, materials, schedules, inventories (ERP)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	20	40.0	40.0	40.0
	Satisfactory	16	32.0	32.0	72.0
	Good	9	18.0	18.0	90.0
	Excellent	1	2.0	2.0	92.0
	Undecided	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

4.5 Online information about customers are tracked (EPOS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	29	58.0	61.7	61.7
	Satisfactory	11	22.0	23.4	85.1
	Good	4	8.0	8.5	93.6
	Excellent	1	2.0	2.1	95.7
	Undecided	2	4.0	4.3	100.0
	Total	47	94.0	100.0	
Missing	Missed	3	6.0		
Total		50	100.0		

4.6 Uses online systems to achieve operating efficiency (CAD, CAM etc)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	30	60.0	62.5	62.5
	Satisfactory	11	22.0	22.9	85.4
	Good	3	6.0	6.3	91.7
	Undecided	4	8.0	8.3	100.0
	Total	48	96.0	100.0	
Missing	Missed	2	4.0		
Total		50	100.0		

Case Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Information Communication [a]	50	100.0%	0	.0%	50	100.0%

a. Group

Information Communication Frequencies

		Responses		Percent of Cases
		N	Percent	
Information Communication [a]	Poor	140	40.7%	280.0%
	Satisfactory	102	29.7%	204.0%
	Good	61	17.7%	122.0%
	Excellent	14	4.1%	28.0%
	Undecided	27	7.8%	54.0%
Total		344	100.0%	688.0%

a. Group

5. Competitive Position

5.1 Offers low cost/price product by attaining full capacity operations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	20	40.0	40.0	40.0
	Satisfactory	13	26.0	26.0	66.0
	Good	14	28.0	28.0	94.0
	Excellent	1	2.0	2.0	96.0
	Undecided	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

5.2 Is under constant innovation and delivers new products and services to the market

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	27	54.0	54.0	54.0
	Satisfactory	9	18.0	18.0	72.0
	Good	9	18.0	18.0	90.0
	Excellent	1	2.0	2.0	92.0
	Undecided	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

5.3 Offers Quality product, value and services

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	5	10.0	10.2	10.2
	Satisfactory	18	36.0	36.7	46.9
	Good	13	26.0	26.5	73.5
	Excellent	11	22.0	22.4	95.9
	Undecided	2	4.0	4.1	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

5.4 Do have many product variations, wide selections, extended services and attributes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	18	36.0	36.7	36.7
	Satisfactory	14	28.0	28.6	65.3
	Good	6	12.0	12.2	77.6
	Undecided	11	22.0	22.4	100.0
	Total	49	98.0	100.0	
Missing	Missed	1	2.0		
Total		50	100.0		

5.5. Develops energy conserving systems as well as environmentally friendly products

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	14	28.0	28.0	28.0
	Satisfactory	19	38.0	38.0	66.0
	Good	12	24.0	24.0	90.0
	Excellent	2	4.0	4.0	94.0
	Undecided	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

Case Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Competitive Position [a]	50	100.0%	0	.0%	50	100.0%

a. Group

Competitive Position Frequencies

		Responses		Percent of Cases
		N	Percent	
Competitive Position [a]	Poor	84	33.9%	168.0%
	Satisfactory	73	29.4%	146.0%
	Good	54	21.8%	108.0%
	Excellent	15	6.0%	30.0%
	Undecided	22	8.9%	44.0%
Total		248	100.0%	496.0%

a. Group