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QUALITY MANAGEMENT PRACTICES

The case of Harar Brewery Share Company

By Negalegn Alemu

A thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters of Science in Mechanical Engineering (Industrial Engineering stream).

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DECLARATION

I hereby declare that this study; "**Quality Management Practices, the Case of Harar Brewery Share Company**" is my own original work. The study has not been submitted for award of any Degree or Diploma Program in this or any other University/Institutions. All the resource of materials used by this thesis has been properly acknowledged.

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Abstract

In today's tight competitive market, quality is becoming a single competitive dimension in different parts of the world. Several quality management practices have been implemented in several organizations to produce quality product and to deliver quality service. The Ethiopian manufacturing industries are facing different problems in becoming competent in this intense global competition. Poor quality management practice is one of the major causes which forced to be weak in the international market. There are very few local companies which tried to implement different quality management practice like ISO 900 quality management system, ISO 14000 environmental management system and HACCP systems to bring better organizational performance. But these companies couldn't achieve the envisioned result due to ineffective implementation of these quality management systems. Among the local companies Harar Brewery Share Company (HBSC) implemented the three quality management practices interactively and achieved the benefits of implementing those practices.

HBSC, the Ethiopian Quality Award winner in 2009, has better implemented the ISO 9000:2000 QMS, ISO 14001:2004 and HACCP interactively and as a result the financial performance of the company has been improved, the company reduced the process variation and factory standards have been met, about *5,000,000* birr has been saved annually by utilizing resources efficiently, the skill level of the employees have been increased so that becoming productive, customer satisfaction is being growing, the company has been building good images in the society and ultimately the HBSC laid the foundation for the next movement towards achieving total organizational involvement on quality. In bringing these achievements, HBSC faced several challenges and employed strong effort in curving those challenges to the truck of practicing quality management.

From the experience of HBSC, it can be observed that if the efforts of quality management have been practiced effectively and interactively, tangible outcomes can be registered. The lessons HBSC left for other local manufacturers is that it can be possible to achieve better performance by implementing ISO 9000, EMS and HACCP effectively with high commitment. Therefore, other manufacturers should implement these systems and gain the benefit of practicing them.

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List of Abbreviations and Acronyms

AAU Addis Ababa University

ASQ American Society of Quality

BPR Business Process Reengineering

BSI British Standards Institute

CSA Central Statistical Agency

CEO Chief Executive Officer

DOE Design of Experiment

ECBP Engineering Capacity Building Program

EFQM European Foundation for Quality Management

EMS Environmental Management System

EQA Ethiopian Quality Award

FAO Food Aid Organization

FMEA Failure Mode and Effect Analysis

FSMS Food Safety Management System

GDP Gross Domestic Product

HACCP Hazard Analysis and Critical Control Point

HBSC Harar Brewery Share Company

ISIC International Standard Industrial Classification

ISO International Standard organization

JUSE Japan's Union of Scientist and Engineers

MBNQA Malcolm Baldrige National Quality Award

MoTI Ministry of Trade and Industry

NAS National Academy of Science

NASA National Aeronautics and Space Administration

NQI National Quality Infrastructure

OIML International Organization of Legal Metrology

PDCA Plan Do Check Act

QA Quality Assurance

QC Quality Control

QFD Quality Function Deployment

QMS Quality Management System

QSAE Quality and Standard Authority of Ethiopia

SNNP Southern Nations and Nationalities and Peoples

SPC Statistical Process Control

SQC Statistical Quality Control

SQM Supplier Quality Management

TOC Total Quality Control

TQM Total Quality management

UMIST University of Manchester Institute Science and Technology

WHO World Health Organization

WIC Walta Information Center

Chapter one
Introduction

1.1. Background

Quality Management played a great role in positioning several firms in strategic competition. Its evolution passes different stages and each stage left its blue print on quality improvement. Since quality is the most valuable competing dimension, improvements in managing product quality has been undertaken in different parts of the world at different times. Starting from the initial stage which is inspection, it has been grown to the total involvement system called total quality management.

The western world and Japan are the first to understand and act quality management efforts to be competent enough in the globalized market. By implementing those quality management practices, they have gained the benefits.

In the rest of the world especially in developing countries, the implementation and deployment of quality management in their manufacturing as well as service rendering organizations is not as such attractive. In other words, poor quality management practices in these countries forced firms to be weak in market competition.

But very few years onwards little quality management efforts have been employed in manufacturing as well as service giving organizations. Among the major quality management practices implemented currently in different parts of the world; ISO 9000 Quality Management Systems (QMS), Hazard and Critical Control Point, ISO 1400 Environmental Management System (EMS) can be illustrated as main examples.

Ethiopia, which is one of the developing countries, has also similar problems as other developing nations regarding quality management. To make the manufacturing industries competent different quality improvement systems are currently practiced in a very few industries. Apart from implementing QMS, HACCP and EMS, a pilot project has been undertaken to implement kaizen system in some selected manufacturing industries. But still, more efforts should be done to implement such like improvement activities in the country so that the domestic manufacturing industries can survive in this keen competition.

1.2. Problem statement

Quality is now becoming a single competitive weapon in this tight competition. As a result different quality management practices have been undertaken in different parts of the world. Manufacturers are implementing and deploying several quality management practices and efforts to win and assure their survival in the market.

In the Ethiopian manufacturing industries, there are several favorable conditions which support the global competition in different aspects. Especially taking the manufacturing sector; there are plenty of resources like raw material and human resource (man power). But the domestic manufacturing industries cannot bring a tremendous effect on the share of countries GDP. Until recent time the manufacturing sector accounts a little share of the country's GDP. This is because of inability to produce quality product and failure to bring sustained continual quality and productivity improvement practices. Lacking these competing dimensions make our companies to be weak in the global competition. The major problem is lack of effective quality management implementation practices and little efforts to implement quality management practices. This poor quality management practice makes the manufacturing industries to have weak competition power in the market.

There are different quality management practices to be used for improving the product and service quality today. But most of the domestic manufacturing industries lack the implementation of those systems and as a consequence, they are inefficient in producing quality product and delivering quality service. Producing poor quality product has a negative impact on overall performance of the organization. If the overall performance becomes poor, it can't compete with other local and foreign competitors and finally it could be out of market. In short, implementing quality management effectively is an issue of survival, those implementing different quality management practices can compete and survive in the market and those who are poor in implementing quality management efforts will be out of market. Despite the poor performance of industries in quality management, identifying better performing local organization to be taken as a benchmark or as a model is also another problem in the manufacturing industries of Ethiopia.

1.3. Objective of the research

The main objective of this research is to show the existing quality management practice of HBSC and analyzing the efforts deployed and achievements obtained as result of those practices. The specific objectives include:

- Identifying the major efforts employed by the company to bring better organizational performance
- Identifying the achievements and analyzing the factors resulted those achievements
- Analyzing the challenges and draw backs in implementing those quality management practices
- Identifying lessons to be taken by other manufacturing industries
- Customizing the experience of HBSC to the general manufacturing industries.

Generally, the research tries to analyze and present the quality management efforts and practices of HBSC critically so that it can be taken as a lesson or benchmark for other manufacturing industries.

1.4. Research methodology

The methodology followed while working this thesis includes the literature reviewing, data collection, analysis and interpreting the result. First some manufacturing industries have been interviewed and visited to understand the general quality management practices of the manufacturing industries. Then, HBSC is taken as a case for detail analysis of its implementation and effects of implementation. To collect data for the case company, interviewing with senior managers including the general manager has been conducted. Apart from interviewing, the annual report of the company for the past six years, the quality laboratory report and data for the last year (2009/10) and current time (2010/11) has been collected. In addition, the quality manuals such as the food safety management manual, the EMS manual and other manuals have been analyzed critically. Lastly visiting the production processes of the company with detail explanation from brewing technologists and other operators play a great role in understanding the overall performance of the organization.

1.5. Significance of the study

This research is conducted to understand the quality management efforts employed by HBSC and the respective achievements. Ultimately, this can be an input or experience for other manufacturers in implementing those management practices. Therefore, the primary merit of this study goes to the manufacturing industries of Ethiopia. By implementing quality management practices based on the experience of HBSC, they can enhance their productivity and achieve organizational excellence. Secondly, the merit of this research goes to the service industries. Even though the implementation of quality practices has been done for manufacturing industries, service rendering industries can implement them by customizing it with minimal adjustment. In addition, the research can be taken as reference for students and for other researchers who need to work on quality and productivity improvement further.

1.6. Scope and limitation of the study

The scope of this research is limited to understand the general quality management practices of the manufacturing industries of Ethiopia and detail analysis of the case of HBSC on its quality management efforts and practices. In doing the case study, the efforts, achievements, lessons and drawbacks in implementing those practices are the major areas to be analyzed and interpreted critically in this research.

The major limitation while doing this research is financial problem to stay there (HBSC) for further investigation. As the company is far from Addis, it needs some house allowances and some accommodations but none of them have been there for provision.

1.7. Organization of the thesis

This thesis is organized with six chapters. The second chapter of the research is about the literature review related with the concepts of quality management and the implementation practices both in the country as well as internationally. This part started from defining quality and then the development of quality management from the views of quality gurus. The impact of quality gurus for the evolution of quality management has been discussed. In addition to the quality gurus, the impact and the role of quality awards in the development of quality

management has been presented and the main body of knowledge for quality management is also described in detail.

The third chapter of the research covered the country's status in implementing quality management practices. The distribution and coverage of the manufacturing sector, the share of the country's GDP, the competitiveness of Ethiopian firms and related problems have been stated. In addition, the major organizations working on quality and productivity improvement like QSAE and EQA have been presented in detail.

The fourth chapter is about the general quality management related problems of the manufacturing industries of the country. The results obtained from interviewing have been summarized and analyzed using a tree diagram.

The fifth chapter of the research covered detail analysis about the case study. In this part the achievements of HBSC in implementing quality improvement and the methods implemented with the way of implementation has been described in detail. The implementation practices and efforts of HBSC have been developed in this section. More importantly, the significant achievements of HBSC with their respective performance indicators have been analyzed. After analyzing the existing implementation practices, problems on the existing system have been identified and a means to adjust them has been devised.

The last part of the thesis is the conclusion and recommendation section. In this chapter the major findings of the thesis have been concluded and some means, techniques methods or further studies in some untouched areas has been recommended for the Ethiopian manufacturing industries including HBSC.

Chapter Two
Literature Review

2.1.Introduction

This chapter provides an overview on various aspects of Quality Management tracing from the origin and describes some definitions used by academics, consultants, engineers and practitioners. The contribution of quality gurus for the development of quality management has been discussed critically. In addition to the quality gurus, quality awarding organizations throughout the world has played a great role in better understanding new quality management practices like total quality. The Deming prize, the EFQM and the MBNQA are the major contributors. Different researchers, both from the academia and from the industry, have conducted several researches related with the body of knowledge of quality management. The main objective of this chapter is to give a concrete idea about the body of knowledge of quality management and its practices.

2.2. What is quality?

The concept of quality may be easy to grasp but formulating a universal definition is difficult. Several quality authorities have defined quality in various ways considering different attributes of a product (Daniel K, 2009; Ezea T, 2004). Juran defined quality as "Fitness for purpose" or" Quality is customer satisfaction." While Deming put his definition as "Quality should be aimed at the needs of customer, present and future." On the other hand Philip Crosby defined Quality as "Conformance to requirement or specification." Other writers like Feigenbaum define the term quality as "Total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product and service in use will meet the expectations of the customer." In addition to these individual proponents organizations like ISO put their definition for quality. Accordingly, ISO 9000:2000 define quality as "The degree to which a set of inherent characteristics fulfills requirements.''

The definition of quality throughout this research holds the definition stated below and adopted from definition by ANSI / ASQ Standard A-3 1987.

Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy or exceed implied or stated needs and expectations of customers.

2.3. Quality Management

Quality management is a general term used to express the total composition of all systems employed to improve product and service quality of the organization. ISO 9000: 2000 defines quality management as “coordinated activities to direct and control an organization with regard to quality" (www.iso.org). Thus quality management falls within the overall management function of a company. Here the emphasis is on understanding and meeting customer requirements and expectation and on "getting it right first time". It comprises the organizational structure, procedures, processes and resources needed to implement quality management." It establishes quality policy, quality objectives and allocates responsibilities within the organization for achieving the stated quality policy and objectives. The means used to implement the quality policy and attain objectives are quality planning, quality control, quality assurance and quality improvement (Amare, 2006).

When anyone thought about quality management, the development stages and process which have been passed to be here on its state of the art also is being thought. Starting from inspection quality management has been grown to total quality management.

2.4. Evolution of Quality Management

Before few decades ago, quality management has been taken to mean inspecting products according to their specification. But during World War II, statistical sampling techniques were used to evaluate quality, and quality control charts were used to monitor the production process which insures quality became more statistical in this period. Then, in the 1960s, the quality gurus help quality to have a broader meaning (Juran, 1993). Since the 1970s, competition based on quality has grown in importance and has generated tremendous interest, concern, and enthusiasm. Companies in every line of business are focusing on improving quality in order to be more competitive.

Quality management passed through different stages to be on its current state of the art. There are several stages in the development and evolution of quality management. The major development stages are: quality inspection, quality control, quality assurance and quality management.

2.4.1. Quality Inspection

During the early days of manufacturing, an operative's work was inspected and a decision made whether to accept or reject it. As businesses became larger, so too did this role and full time inspection jobs were created (www.iso.org). Accompanying the creation of inspection functions, other problems arose: more technical problems occurred, requiring specialized skills, often not possessed by production workers; the inspectors lacked training; inspectors were ordered to accept defective goods to increase output; skilled workers were promoted into other roles leaving less skilled workers to perform the operational jobs, such as manufacturing.

These changes led to the birth of the separate inspection department with a "chief inspector", reporting to either the person in charge of manufacturing or the works manager. With the creation of this new department, there came new services and issues, e.g, standards, training, recording of data and the accuracy of measuring equipment. It became clear that the responsibilities of the "chief inspector" were more than just product acceptance, and a need to address defect prevention emerged. This led the evolution of quality control.

2.4.2. Quality Control

In the 1920's statistical theory began to be applied effectively to quality control, and in 1924 Shewhart made the first sketch of a modern control chart. His work was later developed by Deming and others constitute much of what today comprises the theory of statistical process control (SPC). However, there was little use of these techniques in manufacturing companies until the late 1940's. In the early 1950's, quality management practices developed rapidly in Japanese plants, and become a major theme in Japanese management philosophy, such that, by 1960, quality control and management had become a national preoccupation [51]. This was the stage in which quality control has been started to be implemented.

Joseph Juran defines quality control as a universal managerial process for conducting operations so as to provide stability to prevent adverse change and to maintain the status quo (Juran and Godfrey, 1993). In Juran's quality trilogy quality control is one of the three basic managerial processes through which quality can be managed.

2.4.3. Quality Assurance

Quality assurance is the next step to quality control. Since the introduction of ISO 9000, quality assurance is being largely understood and practiced. Quality assurance includes all those processes that affect quality directly, including production planning and control, post production operations, maintenance, stores, purchasing, contracts, corporate quality planning, design and development, document control, quality control, internal quality auditing, training, and after sales service (Kamaran moosa, 2000).

The main purpose of quality assurance is to verify that control is being maintained. Performance is evaluated after operations, and the resulting information is provided to both the operating forces and others who have a need to know. Others may include plant, functional, or senior management; corporate staffs; regulatory bodies; customers; and the general public quo (Juran and Godfrey, 1993).

2.4.4. Quality Engineering

Quality engineering, the next stage to quality assurance, is an interdisciplinary science which is concerned with not only producing satisfactory products for customers but also reducing the total loss (manufacturing cost plus quality loss). Hence, quality engineering involved engineering design, process operations, after-sales services, economics and statistics. Taguchi's impact on the concept of quality control in the manufacturing industry has been far-reaching. His quality engineering system has been used successfully by many companies in Japan, the USA and elsewhere. Also, he stresses that quality variation is the main enemy of quality engineering and that every effort should be made to reduce the variation in quality characteristics. Taguchi extensively uses experimental design primarily as a tool to design products more robust (which mean less sensitive) to noise factors. Robust design is an engineering methodology for optimizing the product and process conditions which are minimally sensitive to the various causes of variation, and which produce high-quality products with low development and manufacturing costs. Taguchi's parameter design is an important tool for robust design.

2.4.5. Total Quality Management

Total Quality Management (TQM) has been given different definitions by different individuals. Some of the definitions of TQM have been explained. Besterfield (1995) defined TQM as both a philosophy and a set of guiding principles that represents the foundation of a continuously improving organization. It integrates fundamental management techniques, existing improvement efforts and technical tools under a disciplined approach.

Berry (1991) also defined TQM process as a total corporate focus on meeting and exceeding customer's expectations and significantly reducing costs resulting from poor quality by adopting a new management system and corporate culture. There are still several definitions for the philosophy but there is no any consensuses definition throughout literatures. The most agreed meaning for TQM is "Total quality management is a customer driven, process improvement approach to management which involves knowledge of principles and techniques of behavioral science, quantitative and non-quantitative analysis, economics and system analysis to continuously improve the quality of all activities and relationships"**.**

2.4.6. **Impact of quality gurus**

Different scholars in different world had made several researches to understand the current state of the art of quality management. Quality gurus lay the foundation for better understanding of quality management practices like TQM. Their insights and ideas help a lot in shaping and developing current quality management practices.

W. Edwards Deming stressed the responsibilities of top management to take the lead in changing processes and systems (Deming, 1986). He tried to convince that leadership plays a great role in ensuring the success of quality management, because it is the top management's responsibility to create and communicate a vision to move the firm toward continuous improvement. As Deming most of the quality problems are due to management's problem. Top management gives methods that include an appropriate working environment and climate for work-free of faultfinding, blame or fear (Deming, 1986).

Deming also strongly emphasized the importance of identification and measurement of customer requirements, creation of supplier partnership, use of functional teams to identify and solve

quality problems, enhancement of employee skills, participation of employees, and pursuit of continuous improvement. Deming's main contribution to TQM is his proposed 14 points as salient features of TQM and the Deming's cycle for quality improvement (Deming, 1986; Daneil, 2009; Zhang, 2000).

Another valuable contributor is Dr. Joseph Juran who has had the greatest impact on quality management. He focused on defining quality and cost of quality. Juran is credited with defining quality as fitness for use rather than simply conformance to specifications (Juran and Godfrey, 1993). He defined four broad categories of quality costs, which can be used to evaluate the firm's costs related to quality. According to Juran the four broad quality costs are appraisal costs, internal failure costs, external failure cost and prevention costs. In addition Juran is best known with his quality trilogy; quality control, quality improvement, and quality planning. Ended he contributed a lot in the development of quality management.

Philip Crosby who has been known with his notions "Do it right the first time" and "zero defect" has also contributed in quality management development. And he believed that small number of defects is a normal part of the operating process because systems and workers are imperfect. He also stressed that quality is free and argue those efforts to improve quality more than pay for them because these costs are prevented (Daniel, 2009; Ezra, 2004; Zhang, 2000). Crosby stressed the role of management in the quality improvement effort and the use of statistical control tools in measuring and monitoring quality. As Deming did, Crosby offered a 14-step program that can guide firms in practicing quality improvement (Daniel, 2009; Mabbett, 2002). Philip Crosby has contributed good ideas for achieving quality improvement.

Armand Feigenbaum also argues that all functional activities, such as marketing, designing, engineering, purchasing, manufacturing, inspection, shipping, accounting, installation, service, etc. are involved and responsible for quality. He suggested a system approach to quality which has been developed and became to be known as Total Quality Control (TQC). Like other quality gurus Feigenbaum has also listed ten principles to quality.

Another proponent Kaoru Ishikawa is the first quality guru to emphasize the importance of the internal customer. He is also one of the first to stress the importance of total company quality control, rather than just focusing on products and services. He believed that everyone in the

company needed to be united with a shared vision and a common goal. Ishikawa's concept of total quality contains the following six fundamental principles (Daniel, 2009): quality first-not short-term profits first; customer orientation-not producer orientation; the next step is your customer-breaking down the barrier of sectionalism; using facts and data to make presentations, utilization of statistical methods; respect for humanity as a management philosophy, full participatory management and cross-functional management. In addition, Kaoru Ishikawa developed fifteen effects of company-wide quality control (Alen Mabbett,2002). The other voluble contribution of Ishikawa to quality management is seven tools of statistical quality control. Taken together, these tools are a set of pictures of quality, representing in diagrammatic, or chart form, the quality status of the operation or process being reviewed. The seven SQC tools include: Pareto charts, Ishikawa/fishbone diagrams, Stratification, Check sheets, Histograms, Scatter graphs and Control Charts. Ishikawa gives higher emphasis for the statistical quality control and the total company wide involvement in controlling quality. In addition he proposed the implementations of quality control circles to improve quality continuously.

Dr. Genichi Taguchi, product designer, also played a great role in the development of quality management who estimates that as much as 80 percent of all defective items are caused by poor product design. Taguchi stresses that companies should focus their quality efforts on the design stage, as it is much cheaper and easier to make changes during the product design stage than later during the production process. Taguchi's main contribution to quality improvement was his loss function which used to calculate the loss a product imparts to the society as a function of the distance from the target value of the product. In his loss function Taguchi stressed that it is important to concentrate on reducing the total cost of the process rather than on reducing variation. The loss function is given as follow.

$$L = k (X-T)^2$$

Where L= Loss in terms of money; k = Cost coefficient

X= Value of quality characteristics; T = Target value

Generally, Taguchi has seen quality from the point view of engineering and he took an engineering analysis to control quality. But he was not as much concerned about the management aspects of quality.

Generally**,** philosophies and teachings of quality gurus have contributed to our knowledge and understanding of quality today. They laid a solid foundation for the concept of total quality. The quality gurus share some common points. Some of these points include (Waldman, 1997): All of them argue that quality is a systematic firm-wide activity from suppliers to customers. All functional activities, such as marketing, design, engineering, purchasing, manufacturing, inspection, shipping, accounting, installation and service, should be involved in quality improvement efforts. They strongly stressed on management's responsibility to provide commitment, leadership, empowerment, encouragement, and the appropriate support to technical and human processes. The strategy, policy, and firm-wide evaluation activities are also emphasized by those quality gurus and all of the gurus highly underline the role of employee education and training in changing employees' beliefs, behavior, and attitudes; enhancing employees' abilities in carrying out their duties. In addition, most of the gurus introduce the idea of process controlling than checking at the end. They argue on the emphasis to be on prevention of product defects, not inspection after the event. Accordingly, frequent use of scientific and problem-solving techniques, including statistical process control is also the main emphasizes given by the gurus. Ultimately, most of these gurus argue on the development of a quality culture in implementing TQM.

Even though the quality gurus played great contribution in the development of the concept of total quality, they provide very distinctive ideas about the concept. Some like Deming gave higher emphasis for the statistical nature of quality while others like Ishikawa focused on total company wide participation. Taguchi focused on the minimization of the waste in his loss function while Crosby gave emphasis for zero defects. In summery the quality gurus have contributed a lot in understanding and shaping the concepts of new quality management practices like TQM, though the concept has not a unique structure still.

2.4.7. The Impact of International Quality Award Models

There are several national and international quality award organizations throughout the world. As quality gurus, these organizations also have a significant role in the evolution and development of TQM concept. The Malcolm Baldrige National Quality Award, the European Quality Award and the Deming Prize in Japan are the well-known award models for quality. These organizations

have self-assessment criteria which can be used by different companies to their current performance against a reasonable set of guidelines for total quality**.**

These award models have some common objectives. The first aim is to increase awareness of TQM to organizations because of its important contribution to superior competitiveness. The second most important objective of these award models is to encourage firms to introduce a continuous improvement process which became the hot issue today. In addition these organizations are aimed to stimulate sharing and dissemination of information on successfully deployed quality strategies, promote understanding of the requirements for the attainment of quality excellence and successful deployment of TQM and to encourage systematic self-assessment against established criteria and market awareness simultaneously**.**

The Malcolm Baldrige National Quality Award

Malcolm Baldrige National Quality award is established to encourage American firms to improve quality, satisfy customers, and improve overall firms' performance and capabilities. The model framework can be used to assess firms' current quality management practices, benchmark performance against key competitors and world class standards, and improve relations with suppliers and customers (Juran, 1993, embassy of Japan, 2008].

The basic evaluation criteria of the MBNQA model have seven criteria in its new version (embassy of Japan, 2008). These are: Leadership, Strategic planning, Customer and market focus Information and analysis, Human resource focus, Process management and Business results. The corresponding frame work for the evaluation is shown in figure 2.1.

Figure 2.1: Frameworks of MBNQA model assessment criteria (Juran, 1993)

The European Foundation for Quality Management (EFQM)

The primary purpose of the award is with its enablers and results to support, encourage, and recognize the development of effective TQM by European firms. The enablers are leadership, people management, policy & strategy, resources, and processes while the result part of this model contains people satisfaction, customer satisfaction, impact on society, and business results. EFQM has nine self-assessment criteria (Juran, 1993 and zhang, 2000). The self-assessment criterions are: Leadership, Policy and strategy, People management, Resources, Processes, Customer satisfaction, People satisfaction, Impact on society and Business results. Every self-assessment criteria contains several sub-criteria which can help detail analysis of the companies.

The Deming prize

The main purpose is to spread the quality gospel by recognizing performance improvements flowing from the successful implementation of firm-wide quality control based on statistical quality control techniques. In recognition of Deming's friendship and contributions to Japan, the Deming Prize was established in 1951 at JUSE's suggestion to encourage the development of QC in Japan. The primary elements of the Deming prize are role of management, corporate

culture/values, and infrastructure, involvement/use/role of human resources and adequacy and use of technical resources. These major elements are deployed to the second level of a quality system (Deming, 1986). In addition the checklist of Deming prize is used to evaluate the performance of senior executives according and contains seven criteria. These are: Understanding, Policies, Organization, Human resources, Implementation, Corporate social and Future visions.

Comparison of the quality award models

The three quality award models discussed above provide a universal framework for evaluating aspects of TQM practices in an organization. The MBNQAM, EFQM and the Deming prize have their own framework related to total quality but they have some common points. The first common point is each award model has two parts; the TQM implementation which is the enabler and the overall business results. The other common point for award models is that they emphasized the importance of leadership, human resources management, employee participation, employee education and training, process management, strategy and policy, information, supplier quality management, and customer focus to achieve organizational excellence.

In general, the quality award models provide firms with a means to measure their position against a set of universal criteria, and to identify their strengths and weaknesses in the areas of quality management practices and business results. Quality award models with their self-assessment manuals help organizations in identifying critical improvement areas and problems that hinder organizational performance. Identifying the major improvement area leads for adaption and adoption of different quality management practices to permanently illuminate the problem or continually improve the process. In addition quality awards are important in initiating organizations for further achievement in product and service quality by giving recognition and award for their achievements. Therefore quality awards have a significant positive impact on organizational performance in bringing better quality product and service. The quality awards in different parts of the world are developed to be used as a means to measure organizational performance against a set of criteria.

2.5. Principles and practices of quality management

As it has been stated earlier quality management holds a broader scope. There are several quality management practices implemented and practiced in different organizations to bring better organizational performance. Quality management systems, environmental management systems, hazard analysis and critical control point and currently total quality management have been implemented in in different times.

The implementation of these quality management practices, however, presented significant difficulty for most organizations. These difficulties stem from the origins of quality management as a philosophy, which describes the way in which people should think, act and do business. Therefore, an organization cannot suffice with merely implementing new management tools and practices, but has to capture the hearts and minds of its members. To achieve this, organizations may find guidance in the quality awards and quality standards, like ISO 9000. However, there are no generic strategies ensuring that these benefits will be reaped (Jansen, 2008).

2.5.1. ISO 9000 Quality Management system (QMS)

A QMS can be defined as: "A set of co-ordinated activities to direct and control an organization in order to continually improve the effectiveness and efficiency of its performance". A QMS enables an organization to achieve the goals and objectives set out in its policy and strategy. It provides consistency and satisfaction in terms of methods, materials, equipment, and interacts with all activities of the organization, beginning with the identification of customer requirements and ending with their satisfaction, at every transaction interface. The quality management system is implemented based on the ISO 9000 series of standard. ISO 9000 is a series of standards that represent an international consensus on good management practices that apply to any industry or organization, whether manufacturing or service-based (Valmohammadi and khodapanahi, 2011).

Since ISO 9000 series of standards first emerged in 1987, many authors found that ISO offered a reasonable first step toward implementing quality. The initial version of ISO addressed quality issues in categories such as quality policy, quality documentation and quality planning. However, many authors also contended that the quality issues in ISO 9000 were addressed in a disjointed way scattered throughout the ISO document. The general impression at the time was that there

did not seem to be an overarching TQM framework that guided the implementation of ISO requirements [Martinez-cost et.hal, 2009].

Even though ISO 9000 is widely known, its first version was considered as it has no or little impact on company-wide performance. But the second version ISO 9000:2000 contains more of the TQM philosophies and its impact on performance has been understood positively. ISO 9001:2000 has introduced the principle of continuous improvement that was conspicuously missing in the previous version (Jansen, 2008).

2.5.1.1.Structure of ISO 9000 QMS

The ISO 9000 standard provides the fundamentals and vocabulary used in the entire ISO 9000 family of standards. It sets the stage for understanding the basic elements of quality management as described in the ISO standards. ISO 9000 introduces users to the eight Quality Management Principles as well as the use of the process approach to achieve continual improvement. The figure below shows the continual improvement cycle (www.iso.org).

ISO 9001 is the standard in the ISO 9000 family against whose requirements your quality management system can be certified by an external body. The standard recognizes that the term "product" applies to services, processed material, hardware and software intended for your customer. The requirements in four of the sections are applicable to all organizations quality management system, management responsibility, resource management, and measurement, analysis and improvement. ISO's most recent family of standards for quality management systems comprises (www.iso.org):

- ISO/FDIS 9000:2000 - Quality management systems – Fundamentals and vocabulary
- ISO/FDIS 9001:2000 - Quality management systems – Requirements
- ISO/FDIS 9004:2000 – Guidelines for performance improvement

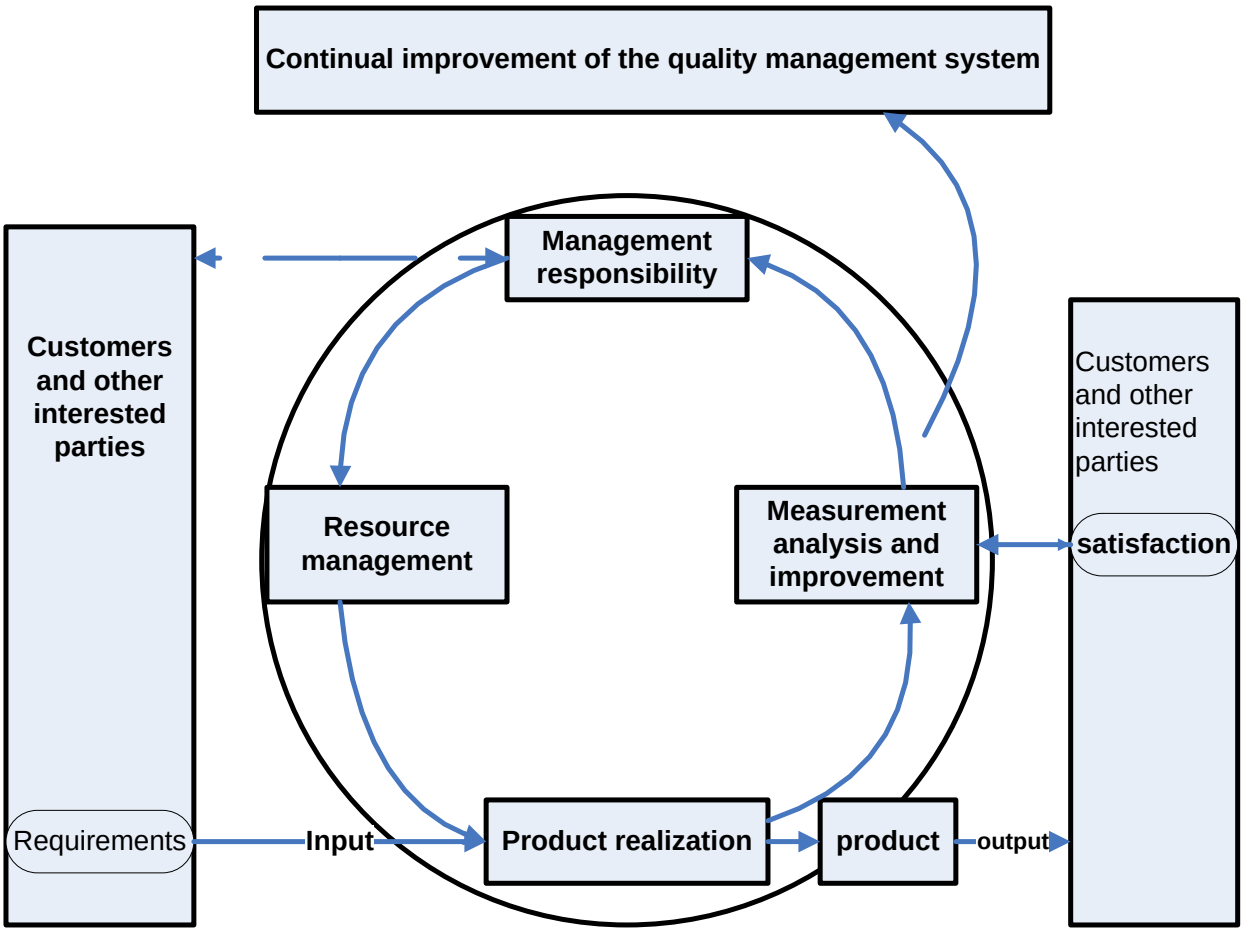

Figure 2.2: the ISO 9000 process approach (source www.iso.org)

The ISO 9000 quality management system has been implemented in several companies in different manufacturing as well as service giving organizations. The number of certified companies and member countries are increasing from time to time.

2.5.1.2. Benefits and criticisms of ISO 9000

For many organizations adaptation of ISO 9000 is a first step in becoming a total quality oriented organization. By choosing ISO 9000 as a starting point, different organizations benefit from the directives forthcoming from the standard which should provide guidance during the implementation process. In addition to guidance, the most cited benefits in literature obtained by companies implementing ISO 9000 are (Jansen, 2008):

- Increased market opportunities, as customers will see your company is more effective and better organized;
- reduced costs
- stronger reputation in the eyes of stakeholders;
- reduced waste (time and materials);
- win more business through complying with an internationally recognized and respected standard;
- compete more effectively through increased customer satisfaction;
- improved management control; and
- higher profit margins, sales per employee and a higher profit per employee than the industry average

In addition, the British Standard Institute (BSI), outlined the benefits ISO 9000 QMS with the respective stakeholders. Table 2.1 represents the benefits of ISO 9000 as illustrated by BSI.

Table 2.1 benefits of ISO by BSI

Customers and users benefit by receiving the products that are: ❖ Conforming to the requirements ❖ Dependable and reliable ❖ Available when needed ❖ Maintainable	***People in the organization*** benefit by: ❖ Better working conditions ❖ Increased job satisfaction ❖ Improved health and safety ❖ Improved morale
Owners and investors benefit by: ❖ Increased return on investment ❖ Improved operational results ❖ Increased market share ❖ Increased profits	***Society*** benefits by: ❖ Fulfillment of legal and regulatory requirements ❖ Improved health and safety ❖ Reduced environmental impact ❖ Increased security

Despite its benefits, the ISO 9000 has several criticisms from different researchers and expertise. The main critiques of the system include (Juran,1993 and karsten,2007): ISO 9000 starts from the

flawed presumption that work is best controlled by specifying and controlling procedures, ISO 9000 encourages organizations to act in ways that make things worse for their customers, the standard relies too much on people's interpretations of quality, particularly those of auditors, ISO 9000 has discouraged managers from learning about the theory of variation, ISO 9000 focuses on the procedural nature of the standard and high the investment required for its implementation. Although there are several critiques on ISO 9000 management system, the certification and membership for the management system is still increasing.

2.5.1.3. Does ISO 9000 guaranty quality product?

Even though QMS has benefited manufacturers significantly, it is important to note that ISO 9000 is not a product standard and does not guarantee improved product quality. The focus is on managing core value-added processes to deliver quality. ISO 9000 establishes the requirements for what the company must do to manage its quality-related processes. This fact has led many managers to talk about ISO 9000 in terms of the documentation of their companies' quality management practices. By documenting the existing processes and comparing them to "consensus" best practices, companies can begin the journey toward improved quality practice and results (Jansen, 2008).

Implementing ISO 9000 improves the systems and processes which can affect product quality. An ISO 9000 company has a guarantee in producing similar products in any time under normal condition because the process is standardized and documented. Here it does not mean that a company which has no ISO certification cannot produce a quality product. It can produce but has no any guarantee to repeat a sampled product with all its characteristics as a process has not been standardized.

2.5.1.4.Implementation process of ISO 9000 Quality management systems

The implementation process is important in achieving the full benefits of the quality management system (QMS). For a successful implementation of QMS, these 14 steps are recommended.

***Step 1: Top Management Commitment*:** The top management (managing director or chief executive) should demonstrate a commitment and a determination to implement an ISO 9000 quality management system in the organization. Without top management commitment, no

quality initiative can succeed. Top management must be convinced that registration and certification will enable the organization to demonstrate to its customers a visible commitment to quality. It should realize that a quality management system would improve overall business efficiency by elimination of wasteful duplication in management system.

***Step 2: Establish Implementation Team*:** ISO 9000 is implemented by people. The first phase of implementation calls for the commitment of top management - the CEO and perhaps a handful of other key people. The next step is to establish implementation team and appoint a Management Representative (MR) as its coordinator to plan and oversee implementation. Its members should include representatives of all functions of the organization marketing, design and development, planning, production, quality control, etc.

***Step 3: Start ISO 9000 Awareness Programs*:** ISO 9000 awareness programs should be conducted to communicate to the employees the aim of the ISO 9000 quality management system; the advantage it offers to employees, customers and the organization; how it will work; and their roles and responsibilities within the system. Suppliers of materials and components should also participate in these programs.

Step 4: Provide Training: Since the ISO 9000 quality management system affects all the areas and all personnel in the organization, training programs should be structured for different categories of employees, senior managers, middle-level managers, supervisors and workers. The ISO 9000 implementation plan should make provision for this training. The training should cover the basic concepts of quality management systems and the standard and their overall impact on the strategic goals of the organization, the changed processes, and the likely work culture implications of the system. In addition, initial training may also be necessary on writing quality manuals, procedures and work instruction; auditing principles; techniques of laboratory management; calibration; testing procedures, etc.

Step 5: Conduct Initial Status Survey: ISO 9000 does not require duplication of effort or redundant system. The goal of ISO 9000 is to create a quality management system that conforms to the standard. This does not preclude incorporating, adapting, and adding onto quality programs already in place. So the next step in the implementation process is to compare the organization's

existing quality management system, if there is one with the requirements of the standard (ISO 9001:2000).

Step 6 Create a Documented Implementation Plan: Once the organization has obtained a clear picture of how its quality management system compares with the ISO 9001:2000 standard, all non-conformances must be addressed with a documented implementation plan. Usually, the plan calls for identifying and describing processes to make the organization's quality management system fully in compliance with the standard.

Step 7: Develop Quality Management System Documentation**:** Documentation is the most common area of non-conformance among organizations wishing to implement ISO 9000 quality management systems. Documentation of the quality management system should include: documented statements of a quality policy and quality objectives, a quality manual, documented procedures and records required by the standard ISO 9001:2000, and documents needed by the organization to ensure the effective planning, operation and control of its processes.

Step 8: Document Control**:** Once the necessary quality management system documentation has been generated, a documented system must be created to control it. Control is simply a means of managing the creation, approval, distribution, revision, storage, and disposal of the various types of documentation. Document control systems should be as simple and as easy to operate as possible sufficient to meet ISO 9001:2000 requirements and that is all.

Step 9: Implementation: It is good practice to implement the quality management system being documented as the documentation is developed, although this may be more effective in larger firms. In smaller companies, the quality management system is often implemented all at once throughout the organization. Where phased implementation takes place, the effectiveness of the system in selected areas can be evaluated.

Step 10: Internal Quality Audit: As the system is being installed, its effectiveness should be checked by regular internal quality audits. Internal quality audits are conducted to verify that the installed quality management system: conform to the planned arrangements, to the requirements of the standard (ISO 9001:2000) and to the quality management system requirements established by your organization, and Is effectively implemented and maintained.

Step 11: Management Review: When the installed quality management system has been operating for three to six months, an internal audit and management review should be conducted and corrective actions implemented. The management reviews are conducted to ensure the continuing suitability, adequacy and effectiveness of the quality management system. The review should include assessing opportunities for improvement and the need for changes to the quality management system, including the quality policy and quality objectives.

Step 12: Pre-assessment Audit: When system deficiencies are no longer visible, it is normally time to apply for certification. However, before doing so, a pre-assessment audit should be arranged with an independent and qualified auditor. Sometimes certification bodies provide this service for a nominal charge. The pre-assessment audit would provide a degree of confidence for formally going ahead with an application for certification.

Step 13: Certification and Registration: Once the quality management system has been in operation for a few months and has stabilized, a formal application for certification could be made to a selected certification agency. The certification agency first carries out an audit of the document. If the documents conform to the requirements of the quality standard, then on-site audit is carried out.

Step 14: Continual Improvement: Certification to ISO 9000 should not be an end. You should continually seek to improve the effectiveness and suitability of the quality management system through the use of quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

2.5.1.5.Why ISO implementations fail?

Implementation of ISO 9000 affects the entire organization right from the start. If pursued with total dedication, it results in 'cultural transition' to an atmosphere of continuous improvement. Despite the growth of ISO certification, several companies used the certification as a marketing means without implementing in the process. There are several barriers which make the implementation of ISO 9000 management system to be ineffective. The most discussed factors in the QMS literature include:

- Lack of top management support and commitment;

- Employee resistance to change;
- Lack of understanding of ISO 9000 system;
- Constraints on resources (manpower, time and finance);
- Lack of training and education of employees;
- Unclear benefits of obtaining certification
- Excessive documentation and control; and
- Underestimation of the efforts and resources needed in certification.

Due to these factors the implementation of ISO 9000 quality management have not bring a significant benefit for organizations especially in developing countries yet. This is because of the failure in implementation of such programs.

2.5.1.6. ISO 9000 and Ethiopian Manufacturing firms

The Ethiopian manufacturing industries are currently becoming ISO certified and tried to implement ISO 9000 quality management system. The number of organization being certified is increasing as compared to few years ago even if the number is still very small. But, the achievements obtained by being certified in the country are very low or almost no achievements have been seen. This is because of ineffective implementation of the system. But, there are some manufacturing industries that can be taken as a model in implementing ISO 9000 quality management system like Harar Brewery Share Company (HBSC).

HBSC has started to implement QMS in 2005 and now achieved some benefits obtained from the implementation of those quality management efforts. During the implementation period, the company faced several challenges like employee resistance to change, inability to understand ISO 9000 system, poor training and education, weak management commitment and the likes. But, by eliminating those challenges step by step, the company is now achieved the benefit that can be obtained in implementing ISO QMS. The major factor which help the company to implement the system better is that the emphasis given for the effort that should be employed during implementation. The company understands that higher effort should be employed to implement any quality management systems.

The major drawbacks in implementing ISO 9000 in Ethiopian manufacturing industries can be summarized as follow.

Lack understanding ISO 9000 system: understanding the concepts and principles and policies of the ISO system is a prerequisite in implementing the system. To understand ISO 9000 internal experts and external expert supported training and education is a mandatory task. But this is not commonly practiced in the organizations, they simply certify and try to implement the system and the implementation fails.

Considering ISO as a marketing tool: in most ISO certified companies of Ethiopia, ISO certification is seen simply as marketing means on the belief that if the company is certified, customers may perceive as it produces quality product. So they say to their customer that as they are producing quality product because ISO has given certification for their product quality. Here, if implemented and products are produced according to the customer requirement by considering customer satisfaction, it can be taken as a marketing tool too. But without implementing it and by documenting it, it is difficult to bring the intended benefits of ISO 9000 quality management system.

Lack management commitment: if management is committed, it is one step forward to implement such quality management systems. In Ethiopian manufacturing industries, the commitment of top management in implementing quality improvement efforts is very poor. As a result the implementation of ISO 9000 quality management system has not bring tremendous effect as expected in those few certified companies.

In general, ISO 9000 quality management system if effectively implemented can bring its stated benefits like better financial performance, quality improvement, productivity improvement and customer satisfaction. ISO quality management system is one better solution for Ethiopian manufacturers because apart from better achievements, being certified in ISO is now becoming a must to compete in international market. Ended the implementation of the system is possible and can bring tangible achievements as it has been seen in HBSC.

2.5.2. Environmental Management System(EMS)

An Environmental Management System (EMS) is a globally embraced organizational management practice that allows an organization to strategically address its environmental issues and well as related health and safety matters. EMS implementation reflects accepted quality management principles based on the “Plan, Do, Check, Act,” model using a standard process to

identify current activities, establish goals, and implement plans to meet the goals, determine progress, and make improvements to ensure continual improvement. Implementation of an EMS begins with a comprehensive evaluation of an organization's operations and activities to determine how they can or do impact the environment. The EMS process then establishes goals and programs to address those impacts and improve efficiencies in the environmental footprint of the organization. The resulting plans are deployed throughout the organization, usually through existing management mechanisms. As the system evolves, it is evaluated to determine whether the goals are being met and, if necessary, plans are amended to achieve the intended goals and continue the improvement process. Each of these elements also serves to make the organization more efficient and prepared to focus on its mission (US. Department of army,2004).

The goal of implementation of an EMS framework is to ensure that the approach taken is the most effective in order to enhance the capabilities of the organization to pursue its mission. Successful EMS implementation helps organizations avoid problems and improve efficiency by increasing awareness of the role that environmental issues play in supporting the mission of the organization.

Now a day, implementing ISO 14001: 2004 Environmental Management System is increasing due to the following needs:

- Global concern to environmental protection
- Comply with the legal and other requirements
- Improve competitiveness and image of the organization
- Ensures sustainable development
- Prevent pollution at the source
- Promote efficient utilization of resource.

As a result, different companies have implemented ISO 14001:2004 and achieved the benefits of implementing them. In Ethiopia also there are very few manufacturing industries who have implemented the EMS. The Dire Dawa Food Complex Share Company and Harar Brewery Share Company are the domestic companies who have implemented the system better. By implementing this management system, especially HBSC has benefited a lot.

Generally, EMS represents a major culture change from the old paradigm where environmental issues were seen as an obstacle to mission success. That means implementing EMS has benefits beyond protecting the environment and will benefit in addressing the goals and objectives of the company.

2.5.3. Hazard Analysis and Control Point

The HACCP concept had its origin in the USA and stands for "Hazard Analysis Critical Control Point". In 1958 the concept of HACCP has been discussed at NASA (National Aeronautics and Space Administration). In 1959 the development of the HACCP concept to assure one hundred percent safety of food to be used in space has been conducted. As a result the HACCP system was published and documented in the USA in 1971. Following the publication, in 1985 the National Academy of Science (NAS) recommended the use of the system. Then, worldwide the system became used and the FAO/WHO Codex Alimentarius cited the system in the Codex (Khalil, 2005).

The main concept of HACCP is to develop a plan that anticipates and identifies places in the production process known as critical control points (CCP's) where contaminants might be introduced or other food safety concerns can be identified. There are limits for each identify control points and when critical limits are exceeded, corrective action must be taken and documented. A HACCP program is unique and specific to each product in each processing facility and requires a thorough analysis of each phase of processing at that facility and this necessitates trained personnel.

HACCP comprises seven principles which have been listed below [HBSC, 2009; Khalil, 2005; ECHCP, 2005].

1. ***Conduct a Hazard Analysis***: Assess the food safety hazards that are reasonably likely to occur and that must be controlled for almonds or almond products based upon experience, illness data, scientific reports, or other information.
2. ***Determine Critical Control Points***: The identification of a critical point for the control of a hazard requires a logical approach. Such an approach can be facilitated by the use of a decision tree (other methods can be used by the team, according to their knowledge and

experience). For the application of the decision tree, each process step identified in the flow diagram should be considered in sequence. At each step, the decision tree must be applied to each hazard that may be reasonably expected to occur or be introduced and each control measure identified. Application of the decision tree should be flexible, having consideration for the whole manufacturing process in order to avoid, whenever possible, unnecessary critical points . The decision tree is used to identify control points have been shown below.

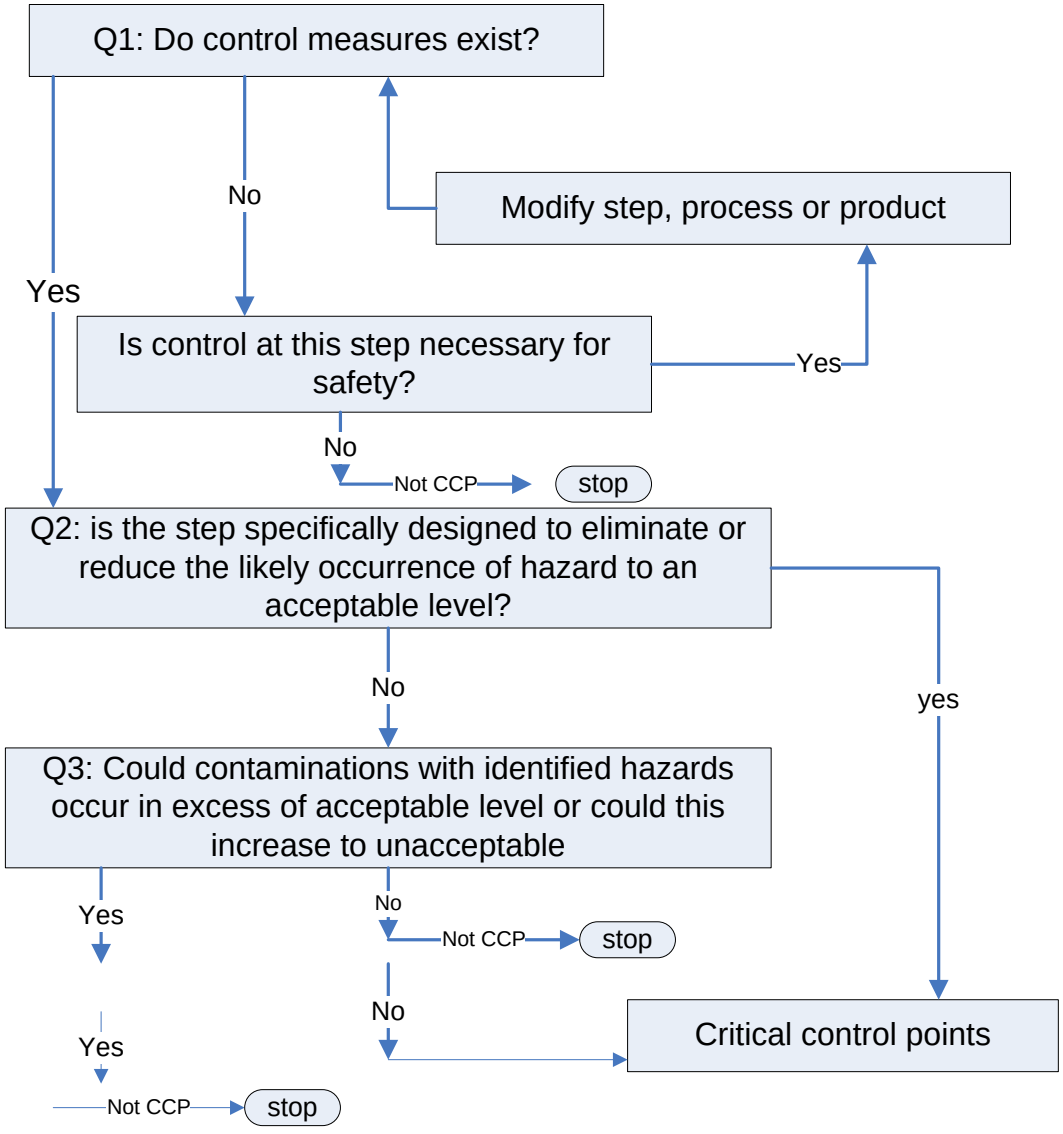

Figure 2.3: Decision tree to identify Critical Control Points (HBSC, 2009; ECHCP, 2005)

3. ***Establish Critical Limits*:** Critical limits are tolerances beyond which the related CCP is out of control and a potential hazard can exist. A critical limit is a maximum and/or minimum

value at which control must be maintained for the CCP. These CCP limits cannot be average values or ranges of values and must be validated by the processor or be supported by scientific data or literature.

4. ***Establish Monitoring Procedures*:** monitoring is a scheduled observation of a CCP and its limits in which the procedure must be reliable enough and performed often enough to ensure that the hazard is under control.
5. ***Establish Corrective Actions***: When there is deviation from an established CCP, corrective actions must be taken to prevent a product that may be unsafe from reaching consumers. Corrective action must include correcting the problem and putting the process back in control, and placing the product on hold pending evaluation of safety.
6. ***Establish Verification Procedures*:** Every HACCP plan should be examined to validate its ability to control food safety hazards that are reasonably likely to occur, and that the plan is being effectively implemented.
7. ***Establish Record Keeping and Documentation Procedures***: The HACCP plan must be on file at the facility and must include documentation relating to CCP's and any action on deviations and/or disposition of product.

In general implementing HACCP can help processing industries in producing quality or hazard free product and to keep customers' safety. The implementation of HACCP is not difficult but it needs consistent, steady, and diligent effort to constantly think about the process/product and be ready to implement changes to enhance food safety.

2.6. Tools and techniques of quality management

Tools and techniques of quality management are the major supporting factors in implementing quality management program. These tools and techniques should be implemented integrated with systems and principles to support decision making and process optimization. Both quantitative as well as qualitative tools should be implemented in corresponding processes. The major tools and techniques of quality management are highlighted as below.

Quality policy deployment (QPD): is used at the upper management level to develop quality policies, derive objectives, carry out departmental planning of processes and resources to achieve the objectives, cascade the objectives to lower sections, monitor the implementation plans of

these objectives, take corrective actions if objectives are not met, and report performance on meeting objectives. All departmental heads must be involved in quality planning using this technique.

Quality function deployment (QFD): is a powerful planning tool to align the company products and processes to the market needs. Customer's needs are first understood in the customer's own terms; then deployed into design requirements and subsequently through the manufacturing chain of critical part characteristics and key process requirements; and finally deployed to operational specifications. Key Marketing, Design, Production, and Quality departments' staff must be familiar with this tool and need to use it in their quality planning

Seven QC tools: considered as indispensable elementary tools for problem solving. They are applied by everyone from the management down to line workers and are not just for the Quality Dept. However, the minimum requirement is up to the supervisors' level. These tools are: Check sheets, Cause and Effect Diagram, Pareto Diagram, Stratification, Scatter Diagram, Histogram, and Control Charts.

Failure mode and effect analysis (FMEA): this is used to identify the root causes of problems in the process. It should be implemented in the company to take remedial actions by understanding causes of problems.

Total productive maintenance (TPM): this is company-wide delegating preventive maintenance and progressively involving people in taking initiatives and actions for the optimum life of equipment being used by them. The purpose is to optimize resources and increase productivity.

Acceptance sampling: A sample should be taken from a lot and inspected periodically to understand or to check whether the process is working properly or not. A lot can be accepted or rejected according to the sampling plan.

Project teams: organizing project teams which under takes improvement activities are another crucial technique in implementing quality management. Different cross functional teams with their respective objectives should be organized and get started with continual evaluation by the management.

Benchmarking: it is an effective catalyst for change and an effective tool for continuous improvement. It is an understanding of the methods and process of best practice or best in class organizations and customizing or adopting that system and technique to improve the performance of own organization.

2.7.Quality management and developing economies

Quality management practices in developing countries are still at the initial stage. The quality management evolution has given the matured total quality management system in developed world. In order to implement the recent quality management practices like TQM, the developing economies don't expect to pass through all stages of quality management development. They can start and implement the current states of quality management.

Developing economies can bring tremendous improvement by implementing modern quality management systems like TQM in their manufacturing as well as service rendering enterprises. This is because TQM is a boundary crossing philosophy and can be adapted for different national and organizational cultures. The developing countries in Asia have brought an abrupt improvement by implementing TQM. Therefore list developing countries in Africa should take the experiences of the Asian countries and take actions for their business management and improvement by implementing TQM and other improvement philosophies.

The major problem that could affect the implementation of modern quality management systems in African countries may be the culture. It takes long time to bring cultural changes. For-example a TQM implementation has failed in Burkina Faso due to some reasons like high level of illiteracy in the firms, Access to the internal informal communication within an organization requires particular language skills, hierarchical structure in the company prevents the implementation of a participative approach between middle managers and employees, systematic attention to improving worker satisfaction is lacking, system of continuous training is required but difficult to put in place and Motivation amongst employees and trust in top management are low.

The problems above can be summarized with lack of top management commitment and inability to bring cultural transformation in the country. Top management commitment can be brought by attending extensive trainings and education about those techniques and systems to be implemented and a top-down to training and education system can be organized and the commitment of the management can be secured. The difficult thing is to bring cultural transformation or change. Again training and education can be a tool to bring cultural change. To bring cultural transformation, the mind set up of the citizens of a country should be changed and this can be achieved by focusing on education starting from the kindergarten to the universities. One commercial manager has said that: "Bosses in Africa have often been to Europe to learn about cooperation with employees, asking their opinion, but when they get back to Africa they will still act like the boss, and allow no room for opinions of lower ranked employees. This is true for bosses in all ranks. It seems that cultural assumptions about how bosses should behave are more influential than schools. But of course they will tell you what they have learned in the Western schools" (Kardten and Pennink, 2007). The main point here is that formal education only can't bring cultural changes effectively but formal education should be supported with informal education from family, society, different Medias and the likes.

To implement modern quality management systems in Ethiopian manufacturing industries, the problems raised as cause for failure of implementation in Botswana may not be the preseasons to fail. Even though there are several nations in the country, the language is not as such hindrance in implementing such systems. Even the hierarchical structure of the companies is not as such difficult issue because it can be changed or reorganized easily. The factor which can be an obstacle in implementing modern management systems in Ethiopia is bringing cultural changes. A paradigm shift from working individually to group mentality, form boss leadership to participatory leadership and from tight control of employee to recognition and empowering the employee should be achieved. Bringing these my take long time but still both formal and informal educations are the means to bring those cultural transformations or transitions.

Generally, to implement modern quality management systems and to bring continual improvement in African manufacturing industries, education, both formal and informal, should be the primary focus. Well educated citizens are logical in adapting as well as in resisting a new

culture and quality management is by itself a culture; the adaption to it cannot be as such difficult. Therefore, education should be the priority focus.

2.8. Summery

Quality management has evolved from inspection and passed through quality control, quality assurance and quality engineering stages to be on its present stage total quality management. Each stage has left its blue print in managing product quality. In moving on such quality journey, different quality management practices have been developed and implemented in different parts of the world in different times. ISO 9000 quality management system development and implementation, Environmental management System, HACCP and TQM are the major quality management practices implemented in different world class organizations and bring tangible achievements.

ISO 9000 management system with its criticism and drawbacks have been getting greater global acceptance. This is because if implemented effectively, it can increase market opportunities, reduce costs, reduce waste, complying international standards, increase customer satisfaction and improve management control. Ended, implementing ISO 9000 quality management systems have positive impacts on organizational performance. Especially for developing countries like Ethiopia, it is better solution to manage product quality so that to compete in international market by complying the requirements and standards. Even though few organizations in Ethiopia have been certified the ISO 9000, they lack to implement the system and very few companies like HBSC has implemented the system better and achieved tangible outcomes. In addition to the ISO 9000 quality management system, the Environmental management system has gain better worldwide acceptance. EMS if implemented well can benefit organizations not only in protecting the environment but also in achieving missions and objectives of an organization. The HACCP system is also another quality management practice which is implemented in food and beverage industries to secure food safety so that customers will be satisfied and secured from hazards. The ISO 9000, EMS and HACCP in total comprise the major elements of total quality. Even though it has not been practiced in developing economies, TQM is one important quality management practice in western and Japanese industries.

Chapter Three
Quality Management in Ethiopian Manufacturing Industries

As it has been discussed above quality is becoming a single dimension weapon for competitiveness. Quality is a survival issue in today's glob. Especially in developing countries, quality can play a significant role in boosting their economy. Ethiopia as other developing economies has little practices regarding quality management. This section showed an overview about the current scenario of the quality aspects in a manufacturing environment.

3.1.Manufacturing industries in Ethiopia

Manufacturing, according to International Standard Industrial Classification (ISIC Revision-3.1) is defined as "The physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail. The assembly of the component parts of manufactured products is also considered as manufacturing activities."

The industrial development of the country is under lower level. But recently there is better growth in the country's economy. Despite fast economic growth in recent years, the structure of the economy has stayed unchanged for many decades. The World Bank report in 2008 showed that the contribution of the industrial sector has remained at an average value of about 13.12 % for the last two decades.

According to the Central Statistical Agency report, total number of large and medium scale manufacturing establishments for the country as a whole stood at 2203 in 2008/2009. It has shown an increase of 273 establishments or 14.1 percent compared to the year before in absolute and relative terms, respectively. For the country as a whole, establishments classified under manufacture of Other Non-Metallic Mineral Products industrial group constituted the largest share accounting for 27.6 percent of the total.

The output by these industries among others include: glass and glass products, structural clay products, cement, lime and plaster and article of concrete, cement and plaster. Manufacture of food products, beverages and manufacture of furniture, which represented 25.5 and 16.5 percent

of the total number of establishments, were in second and third position, respectively. That means the share of the three industrial groups combined was 69.6 percent of the total number of manufacturing industries, which indicates that, the Ethiopian Large and Medium Scale Manufacturing Industry is characterized by a high concentration of a limited range of manufacturing activities (CSA, 2010).

The distribution of large and medium scale manufacturing industries by regional states of the country is highly skewed. Slightly more than forty percent of the total large and medium scale manufacturing industries, which were operating in reference year 2008, was located in Addis Ababa. Following Addis Ababa, Oromiya, S.N.N.P., Amhara and Tigray Regional States covered 16.5, 14.0, 12.3 and 11.2 percent of the total establishments, respectively.

In addition the total number of persons engaged and number of employees over five year's period shows an increment (2004/5-2008/9). In 2008/9, there were 151,303 persons engaged, out of which, 148,817 were, employees in the manufacturing sector (CSA, 2008).

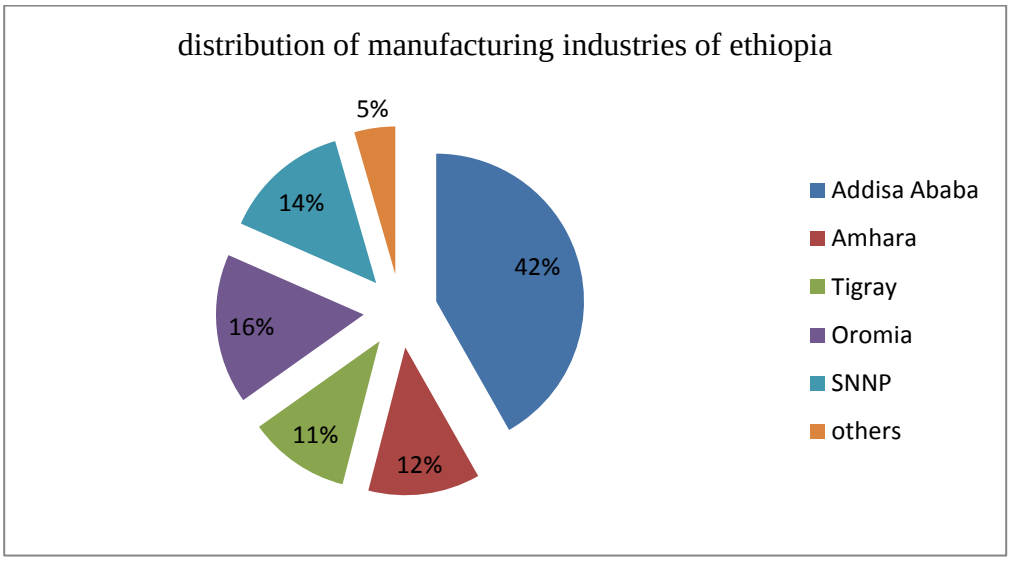

Figure 3.1: Distribution of manufacturing industries in Ethiopia (source: CSA 2008/09 report)

3.2.Competitive ability of the domestic firms

Having a better competitive power is becoming a must in this ever changing world. Domestic and international competitiveness for a firm/industry is influenced by factors internal as well as external to the firm/industry (Birhanu and Kibre, 2004). External factors include government policies and incentives in which firms in the industry operate including macroeconomic and sectorial policies, legal and regulatory measures, trade and investment specific incentives, etc. The level of industrialization or stage of development of a country, supply of export support services, and the nature of the international trading regime (i.e., international trade laws and regulations) are also external factors that affect competitiveness (Birhanu and Kibre, 2004). These factors significantly affect the competitive status of industries, particularly in the international arena. On the other hand, factors internal to the firm basically determine the physical productivity level, and hence the unit cost of production of a given quality product.

The competitive power of the domestic firms in the international market is very low as compared to other external competitors. Until recent time, the major exported items are agricultural products. But the direction of the government being towards export promotion and import substitution may have a great influence on the competitive ability of our firms.

3.3.Organizations working on quality

To improve quality, different organizations have been established and played a great role in the country to improve product and service quality. In Ethiopia there are very few organizations established to do so. The Quality and Standard Authority of Ethiopia, which is reorganized in a new arrangement and the Ethiopian Quality Award, are the major organizations. There are other organizations like the national manufacturer association, the ECBP and JICA who are currently doing quality improvement activities.

3.3.1. Quality and Standards Authority of Ethiopia

Even though it has been re-organized in a new organizational arrangement recently, QSAE was the National Standards Body of Ethiopia which was established in 1970 and became fully

operational in 1972 whose members were appointed by the Government. QSAE was established with the following objectives:

- to promote and assist the establishment of appropriate quality management practices as an integral yet distinct management function in the social and economic sector;
- to assist in the improvement of the quality of products and processes through the promotion and application of Ethiopian standards;
- to promote and coordinate standardization at all levels in the country;
- to establish a sound national metrological system as a basic structure for economic development; to strengthen, promote and enhance the reliability of testing laboratories nation wide

The core business areas of the authority were; Ethiopian standards development, regulation enforcement (compulsory product certification and legal metrology), calibration and laboratory testing, batch product inspection, training and Standards information. In addition, services like Product certification (voluntary schemes/programs) and System certification based on ISO 9000, ISO 14000 and HACCP have been worked.

Even though QSAE was the national standard body working for about 40 years, the journey travelled to be there has both weakness as well as strengths and passed through different challenges. Most recently, QSAE is reorganized in to four independent organizations which are directly accountable to MoST.

Strengths of QSAE

Quality and standard authority of Ethiopia served as a major standard development and quality promoting organization for not less than 40 years. There are some points which can be taken as strength for QSAE. These are

1. Availability of several branch offices
2. Relative autonomous of branch offices
3. Minimum requirement of resources

4. Implementation of civil service programs
5. Availability readiness for change
6. Representing the country in international standardization organizations
7. Being a member of different global organization

With these strengths, QSAE tried to work on quality promotion through the quality promotion and training directorate although it does not meet its stated objectives.

Weakness of QSAE

Even though QSAE contributed some efforts in the development of Ethiopian standards which can be an input in producing quality product, the contribution is not as enough as its age. Some of the drawbacks are listed below.

1. ***Limited involvement of stakeholders*** while developing the standards, the authority lacks support from industry, research institutions, academia and other concerned organizations which resulted in disseminations of technological knowhow among the industries.
2. ***Poor or no support, promotion and motivation mechanism*** for industries to use the Ethiopian standards. Very few standards are currently applied in industries and weakness in implementing the standards makes the technology transfer through standards not to effective as expected.
3. There is ***conflict of interest*** in provision of conformity assessment service. For example, in testing labs and recognition of testing labs.
4. ***Poor in resource utilization:*** there are more than two bodies to give a regulatory service for a single product. For instance, MoH (drug administration) and QSAE may act on the standard of drug. This makes duplicated utilization of country's resource.
5. ***Weak in developing national indigenous standards:*** there are several indigenous products in the country but the organization has developed nothing till. For

example '**Enjera'** is our domestic product with no standard and no any effort to develop a standard for it. The Ethiopian '**Alphabet**' is also another domestic and unique wealth of us but the organization lack a standard to develop for it. Apart from these the Abyssinian dressings and styles, cultures and the likes should have recognition and well established standards but still almost no work regarding the issue. As a result, our indigenous products may be taken by other foreign manufacturers and this can open doors to loss our worth values.

Challenges of QSAE

QSAE passed several challenges both internal and external to the organization while working as a national standard body which affects its performance. Some of the challenges are discussed below.

1. ***Political instability of the country***: QSAE was founded in the emperor period in 1972 with certain objectives. A few years later, military forces hold the power and in this period again QSAE changed some of its activities and objectives. And currently the ruling party, EPRDF, organized the QSAE as a national standard and quality body and worked for about two decades. In this period QSAE has got better freedom and support from the government. But the impact of the political instability in former years has greatly affected its performance.

2. ***Budget problems***: The authority, until its last service, obtained most of its budget from the sale of standards and form some services provided for the customers like the income obtained from training given for different individuals. But since the awareness of the industry about the standards and the services of QSAE is very low, the income rendered from these activities is very low. As a result QSAE faced problems in achieving its stated goals and objectives. For example QSAE missed international standardization meetings due to budget problems. This makes Ethiopia to be a standard taker without any influence on international standards.

3. ***Lack of infrastructure in the country***: The authority has opened several branch offices in different regions of the country. But the services provided by the branch offices were very limited. This was due to problems of communication, fast delivery of reports and related problems.

4. ***Lack of skilled man power***: Having a skilled man power is one of the key inputs for the authority to achieve its objectives. But until recent time technically equipped and fitted man power was the challenge.

Generally, the authority has been challenged in several problems in its long journey. And it laid the foundation for the newly reorganized national quality infrastructure passing through the above listed strengths, weaknesses and challenges. The new NQI is expected to fill the gaps of the QSAE.

3.3.2. The Ethiopian Quality Award

Ethiopian quality award is one of the newly established organizations working in helping the local industries in bringing quality improvement**.** Recognizing the need for implementation and integration of quality concepts in the operations of Ethiopian manufacturing and service industries, Addis Ababa University (AAU) and Walta Information Center (WIC) have initiated the EQA in 2007 (EQA self-assessment manual, 2001). The award is issued annually to organizations which demonstrate performance excellence in product and service quality. Some of the benefits that organizations can achieve through the QA process are: accelerating the organization's improvement efforts, gaining an outside perspective, energizing employees, learning from feedback, focusing on results, role model industries creation, sustainable development and disseminating and promoting quality culture.

The Ethiopian Quality Award has seven assessment criterion and related scores to award organizations which achieve organizational excellence. The model provides a useful audit framework against which an organization can evaluate their quality enhancement tools and, techniques and how these methods will drive progress towards the desired end results. The model focuses on a wide range of production activities, integrated processes, input materials, machine resources, employees' efforts, and dissemination of information on quality strategies. And the assessment model has two parts the drivers and the results. The drivers or enablers are leadership,

policy and strategy, resource management and process. Implementing these drivers can result customer satisfaction, business performance and impact on the society which is the result part. Each and every criterion of the award model has several sub criterions and scoring.

3.4. The National Quality Infrastructure of Ethiopia

National Quality Infrastructure **(NQI)** denotes the totality of the infrastructure (public and private) required to establish and implement standardization, metrology (scientific, industrial, and legal), testing, certification (product and system) and accreditation services necessary to provide demonstrable and acceptable evidence that products and services meet defined requirements. Thus, The NQI comprises a set of institutions within an economy that are capable of inspiring the required confidence amongst suppliers, purchasers and the authorities (ecbp building Ethiopia, 2004). The NQI can play a great role in solving the problems and challenges in which our firms are facing.

The real challenge facing our country is not only the survival of its public and private organizations but ensuring continuous improvement in the quality of products manufactured and services rendered (ASQ). Among several sectorial policies which have given a great attention by the government of Ethiopia, one basic issue is the structural changes required to bring productive system by implementing an effective quality infrastructure, which would be of paramount importance both in the domestic sphere and in the country's relationship to the international economy.

The engineering capacity building program (ecbp) in cooperation with QSAE has developed a National quality infrastructure. Until this stage Ethiopia has no clear NQI. But recently, the existed Quality structure which was mainly depending only on QSAE has been modified and transformed to the new NQI. The existing or the old organizational structure and the newly adopted quality infrastructure organizational structures are shown in Annex 2 and Annex 3 respectively. In the new quality infrastructure, there are basically four bodies which are directly endorsed by the NQI technical committee. The National Accreditation Body, National Metrology Institute, Ethiopian Standard Agency and Ethiopian Conformity Assessment Agency which are derived from the QSAE are now directly accountable to the MoST.

3.4.1. The impact of the NQI on Quality journey

The existence of an organized national quality infrastructure is a pre-request for efficient and cost effective production of quality product and service rendered. The new NQI is developed not only to assure survival but also to insure continuous improvement in quality. This also helps the government policy in eradicating poverty as Deming explained in his book ‘’out of the crisis’’ that investing on quality can lead to the development of the country.

Compared to the old national quality infrastructure, the new NQI is expected to have better positive impacts on the quality improvement. If it has a positive impact on quality means better opportunities to implement different quality improvement techniques like TQM. Some of the positive impacts of the new NQI are summarized below.

1. ***Top management participation in quality practices:*** the new NQI is at large governed by the NQI technical committee which comprises several ministers as a member can force or can change the attentions of the top leaders towards quality. In other words it has better power to influence the direction of the government policy to be towards the quality improvement.

2. ***Customer participation:*** the existence of the customer affairs in the new NQI helps the customers to know their rights and responsibilities in the process of controlling quality. This makes the customer to be aware of the concept quality and this in turn makes our firms to work towards customer focus or customer satisfaction. To satisfy customers and their needs, the companies need implement quality improvement efforts like TQM, BPR and others.

3. ***Better organizational arrangement:*** in the new quality infrastructure, the four main bodies are each independently works the specified task for each of newly emerged bodies. This makes the management process simple and it can achieve the stated objectives easily. Achieving the objectives means insuring continuous improvement in quality products and services which again fosters the implementation of total quality.

4. ***Better technological capability*** the new system is expected to allow technology transfer through standards and this makes our industries to be capable of better technologies like

batter machineries, equipment, processes and the likes. If our firms acquire better machineries and better processes, it is one input in producing quality product and to be active participants in both domestic and international markets.

3.4.2. Problems in the implementation of the new NQI

Transforming the existing quality infrastructure to the newly restructured system was not as such simple. There are varieties of problems raised during the implementation period. Some of the major problems include.

1. Transformation of the ***regulatory service*** to the ministry of trade. The former brunches of the QSAE should be shifted to the ministry of trade as they are working only the regulatory services. This caused to arise conflict of interests between QSAE and the ministry of trade.
2. The implementation is lagging as compared to its action plan due to disagreements between QSAE and the developers of the new NQI, ecbp. The QSAE take the ecbp as a financial supporter but ecbp has been involved in the implementation of the program.
3. Lack of skilled man power to lead the newly organized bodies at the top is also another problem which forces the implementation to lag. But currently three foreigners are being assigned as a leader for each newly organized and independently working body.
4. Blaming between the management of QSAE and the ecbp is another factor which affected the implementation of the quality infrastructure of Ethiopia.

3.5. The triple helix in implementing quality management

In implementing quality management practices, the industry should work interactively with the universities and governmental institutions. The practice in this regard is very poor but the three bodies are the primary participants in the development of the country.

3.5.1. Universities

In bringing continuous improvement in product quality, the manufacturing industries should work cooperatively with the academia and other institutions. For developing nations, the source of researches and development is the academia or universities. The Ethiopian context is also similar

with other developing countries. Those little researches conducted on quality improvement or related problem areas are from the universities but there is no any trend of using the researches conducted by the universities as an input for the manufacturing industries. In addition, there are no almost researches which can solve problems of the manufacturing sector conducted outside the universities. There are two gaps here; first manufacturers are no using researches conducted by academia and secondly there is no any trend of conducting sound researches by the manufacturers.

Therefore, in implementing quality management systems in Ethiopian manufacturing industries, both the universities and the industries should be integrated. If these two are integrated, different quality related problems can be solved by academia and can be taken as an input for industries to bring continuous improvement in product quality and business performance, skilled and capable workers can be created in cooperation with the two bodies, knowledge transfer can be easy between industries, better systems for the manufacturing as well as for the universities can be created. Ended integrating or linking the industry with the universities has an influential impact on the effectiveness of the TQM implementation.

There should be a horizontal linkage between the universities and industries to bring continual improvement. In doing this, application oriented research activities solving problems of local industries can be conducted effectively. In addition project oriented studies-link with company re-engineering and business development services which can benefit both the academia and the industry whose effect is on the development of the country's economy.

Another horizontal linkage that should be created in implementing quality improvement is TVET-industry linkage which brings tremendous effect by providing the skilled manpower for industries. Creating the link helps to take internship programs and to create demand driven TVET and privet sector associations. Integration of TVET with Total Quality Management Systems Implementation can bring better effects on improving quality of product and services.

Ended Universities, GRIs and Industries are the major actors in the national innovation system. The strength and productivity of their linkages depend on the orientation and capacity of the actors to be innovative. This necessitates the linkage to be strengthened with a two way technological flow between the universities and the industries. Their joint efforts shall be focused

on identifying technologies and their sources, understanding the technologies through learning-by-doing and adaptation of these technologies.

3.5.2. Government

In developing nations like Ethiopia, government can have a significant influence on bringing sustained and continual improvement in product quality as well as other organizational performance. But until recent time the link between the government and industry is very week and there was no any type of support from the government. Currently, the direction of the government being on export promotion and import substitution, there are different organization established for supporting the manufacturing industry. For example the Leather Industry Development Institute (LIDI) is a governmental institution organized to support the leather sector of the country in different aspects like conducting research and developments, benchmarking best in class organizations, giving trainings for leather industries and such activities. In addition the Textile Industries development institute performs similar activities as LIDI.

Even though there are some movements to work in cooperation between the industries and government, it is still at a lower level. The government should show its commitment to support the industries and the industries should have a belief on what the government is doing. According to the innovation policy of the country, there are some governmental research institutes planned to be established to support the industry. These are industrial productivity and quality center which comprises the LIDI, textile unit, materials unit, chemicals unit, sugar unit and agro-industry unit. The LIDI and textile units are currently operational and supporting the industries in various researches and activities.

Therefore, to achieve organizational excellence, the government, the academia and the industries should work co-operatively. The triple helix should be formed and this helix can be integrated with the implementation of different quality improvement practices in the manufacturing industries of Ethiopia. The diagram below summarizes the integration of the three bodies.

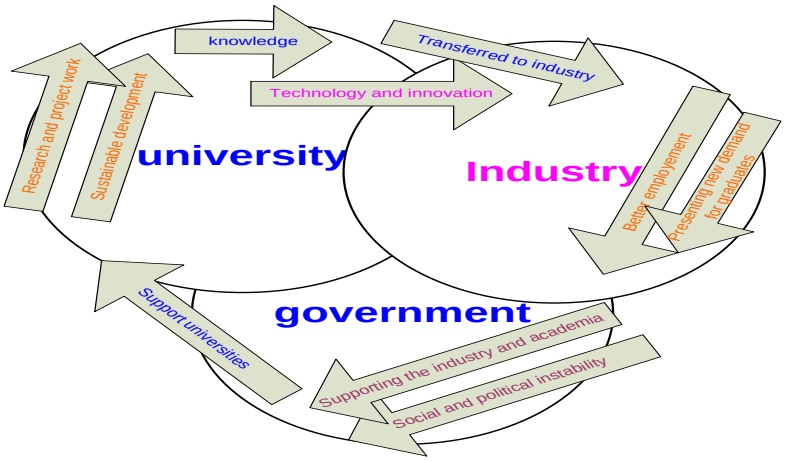

Figure 3.2: the triple helix of the three bodies

3.6. Summery

Despite their concentration in the central city, the number of manufacturing industries is growing from time to time. The growth in number cannot indicate the sector is playing a valuable role in the development of the country in fact it has some contribution for the country's GDP. The effectiveness and competitiveness of the manufacturing industries is very weak due to several reasons. Poor quality product and poor service delivery are among the major causes for inability to compete in the global market.

To promote quality improvement and to support the manufacturers in implementing quality management efforts so that to have competitive power, very few organizations have been established. QSAE and EQA are the two major organization established to do so. QSAE with its stay has contributed several things like development of the Ethiopian standards, delivering trainings, calibration and measurement services, and regulation and enforcement of legal services. But, the organization had some problems or shortcomings while it performs these activities. The newly reorganized national quality infrastructure is expected to fill those gaps and work better than what was performed by QSAE. Another organization with its new establishment working on awarding best performing organizations is the EQA. The EQA self-assessment model helps the organizations to identify their gaps and major improvement areas for further and continual improvement.

Chapter Four
Quality Management Problems of Manufacturing Industries

4.1. Introduction

The main objective of this section is to understand the general problems of the manufacturing industries of Ethiopia in implementing different quality management practices. To do so about 12 manufacturing industries and three supportive organizations have been surveyed using a guided interview. The guided interview questions are organized with two parts. The first part contains the general awareness questions while the second part contains questions dictating problems on systems and principles of quality management. Based on the data obtained from the respondents, this section presents major problems in practicing quality management.

4.2. Awareness about quality and quality management practices

Most of the respondents have better awareness on quality as they gave several meanings for quality but acceptable definitions. But, the awareness about quality doesn't indicate the knowledge they have about quality. They know what quality is but the knowledge they have about quality and how to achieve it is very low. Some relate quality with duration or reliability while others relate quality with function. Still the majority of the managers are aware of major quality management practices like ISO 9000 quality management systems and total quality management. Despite the knowledge, they have awareness about these quality management practices, the majority of managers are aware about the benefits and impacts of implementing these practices in their company but due to the fear and risk of failure, haven't implemented yet. Some managers also speak as their company is implementing TQM but with no any practice on the ground.

Generally, the awareness about quality and quality management in the manufacturing industries is good but since awareness lonely has no value, they should have the knowledge of quality management and bring on to ground for the better performance of the organizations.

4.3. Major problems in implementing quality management

The manufacturing industries of the country are facing several quality related problems currently. These problems stood the manufacturing industries to be weak in competing both in the local and international market. As the surveyed manufacturers reveal, the major quality management related problems have been illustrated as follow.

***Poor leadership and management commitment*:** The respondents of the interview from different companies highly stressed that the role of management commitment in managing quality product and service quality. As the majority of respondents explain, there are no leaders who can be taken as a role model but the country has lots of managers. The problem here is the manager's act as boss style rather than creating participative leadership. Some respondents have given few causes for being poor in leadership. Culture, history and being poor in training and education are the main causes. Generally, the trend is now becoming better as compared to the managers who were years ago even if it is an infant stage.

***Lack Supplier quality management*:** Based on the data obtained from the interviewed officials, it can be concluded that poor quality raw material is the main problem in the manufacturing industries which makes them to loss higher values. Most of the industries have very poor relation with their suppliers and most of them select suppliers on the basis of price only and the communication between them is almost non-existence. But, there are some companies who tried little in controlling quality at the source like Kangaroo Shoe Share Company by sending internal experts to their potential suppliers (Batu tannery), HBSC working joint researches with Asela Malt Factory to improve malt quality. Still the relationship between manufacturers and suppliers is very weak and as a result huge cost saving has being lost.

***Lack of continual training and education*:** In Ethiopian manufacturing industries, there is no well-organized and scheduled training program to be given for employee on the continuous manner. Inadequate training and education is taken as the major causes of poor quality product in the manufacturing industries. According to the respondents of the interview, there are no frequent and organized training and education programs undertaken to improve the knowledge and capacities of workers at different stages. But, there are some companies who are giving training on the continuous manner and bring a significant change in their workers like Harar Brewery and Dire Dawa food complex. Some companies also gives on-job training for newly hired employees

but not further training and education at all. In sum the trend and the level of training and education is still at the lower stage.

***Weak relation with customer*:** when investigating the existing or current situation of the manufacturing industries of Ethiopia, the concept customer and the dignity to be given for the customer is still at the nursling stage. Different researches reveal that most of the managers and the workers have no a clear distinction between internal and external customers. It is known that by enlightening the internal customers it is possible to have delighted external customers. But, our manufacturing industries lack highly the concept of customer satisfaction and as a result they are forced to be weak in this globalized market. But recently, working towards customer satisfaction shows some improvement in some of our manufacturing industries like Harar Brewery S.C. As observed from the interview, most of the managers have no clear idea about internal customers and they simply consider the external customers. Most of them are working to satisfy the external customers by meeting requirements, by handling complaints and by doing other activities. There are no any activities which have been taken to satisfy or delight the internal customers. This made the Ethiopian industries to be at lower level in productivity as well as in competing in the global keen market competition.

***Poor in bringing continuous improvement*:** In some manufacturing industries of Ethiopia, the concept of continuously improving the quality of the product is now becoming better. But in most of the manufacturing industries, continuous improvement is at inspection stage. They inspect the product quality at the end of the process and decide either to accept it or to reject it. Currently, some of the manufacturing industries are applying statistical quality control and statistical process control in controlling the product quality. In some government sectors such as addis Tyre S.C, Harar Brewery and others tried to implement TQM partially to achieve continual improvement. As the data obtained from the interview reveals, the majority of Ethiopian manufacturing industries use inspection to control quality of a product. In-process inspection is also applied in some food processing industries like universal food complex and Faffa Foods S.C in better way. As the respondents, there are no quality control tools applied to control the process and even some of them have no idea about statistical quality control and process control tools.

***Lack employee involvement*:** In Ethiopian manufacturing industries, the involvement of the employees in any decision made in the company is very rare or none. The quality awareness level and understanding of basic concepts of quality is little and the participation of the employees in quality activities is also low (Amare, 2006). As a result the firms are losing several merits like fertile ideas from the employee; the commitment of the employee for every action in the firm, the productivity of the employee also becomes low. In the manufacturing industries, the involvement and empowerment of employees seams one of the missing parameter in bringing organizational excellence as majority of the respondents stressed that involvement is important but the attention given by the management is very low.

***Poor product design*:** inability to design quality product greatly affects the performance of the Ethiopian firms. The data obtained from the interview shows that most of industries consider the customer requirement as an input to design a product. But they don't use any tools to translate the customer requirements to design parameters. The participation of all departments in new product development in a few companies is practiced while in a majority of the companies the product development department is the only responsible body for new product development. In addition, the involvement of customers in product design, use and translation of customers' idea in product development and design is very weak.

Generally, the major hindrance factors in implementing quality management practices in the manufacturing industries of Ethiopia are poor leadership and management, weak relation with suppliers and customers, poor in delivering training and education, poor in involving employees in all activities and decision making tasks, poor in product design. These problems make the implementation effects of quality management practices ineffective.

4.4. Cause and effect analysis of the problem

The data obtained from the interview and observation has been analyzed using a tree diagram as seen in figure 4.1. The tree diagram shows the cause-problem-effect relationships of the quality related gaps in the manufacturing industries of Ethiopia.

There may be several factors within the manufacturing industries of Ethiopia which make the performance of those industries very weak. *Poor quality management practice* is among the major problems in the companies which makes them to be weak in competing in the market. In the tree diagram shown in figure 4.1, the main quality management related problem of the manufacturing industries is poor management practice. There are several causes for the major problem and root causes for those major causes. In addition to the causes, the tree diagram shows the effects of poor quality management practices.

4.4.1. Causes of the main problem

As it has stated earlier, the problem is poor quality management practices in the manufacturing industries. There are several causes for practicing poor quality management in the sector. The main causes obtained from the survey include poor leadership style, weak supplier relationships, lack of skilled manpower, and weak link with customers, lack of sound policy and strategy, and poor knowledge about quality management practices.

Poor leadership: Leadership holds the key to the door of continuous improvement. If the key stays in leadership pocket, the organization has no chance of becoming a quality leader. In other words without clear and consistent leadership, a company will never be a quality leader [38]. When it has been said the leadership is poor it is to mean that the managers or leaders chose tight control rather than leading the members in a democratic way, leaders act like bosses rather than acting like supervisors and being role models for those lower level workers. There are some causes for leaders in the manufacturing industries to be poor. Culture, education and training and history are the major causes.

Culture: in Ethiopian culture, managers are always bosses for what they are managing. They give orders to the lower level members or managers and then these lower level mangers give orders again to the next lower level body. There was no any involvement and discussion between the top leader and other members and decisions were made solely by the leader. In short, power was concentrated at the center in hands of few. This has been practiced for a long time until recent time even in leading the country. The leaders who are working in the manufacturing industries are also derived from such cultures. They need to be respected with their position, they need to order anyone under their position, and they need to be the only decision maker in the company and the

likes. This comes from nowhere but the culture we practiced before has a greater impact in shaping the current leaders poorly.

Lack of effective education and training: Edward Deming (1986) stressed the importance of education and training for continual updating and improvement. This is because training and education provide the necessary skills and knowledge which is the ability to make it happen. Comprehensive training program is necessary and must be institutionalized within the entire organization (Juran, 1993). Education has the power to shape the attitude and thought of leaders if designed effectively. The impact of education can be seen in two ways; the first is education before starting work and the second is education while working. Taking the first case, the education system of Ethiopia until recent time was not participatory that means the education system we passed through didn't give any opportunity to practice leadership in a participatory way. Means to discuss with collogues in decision making, risk taking practices and practice of role modeling for others have been missed. What it has been done is that the students learn about theories and study lonely and evaluated by exams which forces the student to make decisions lonely. Ultimately these practices have a negative impact on effectiveness of the leadership style. The other point is education while working in which the leaders can improve their performance and style if implemented effectively and continually. In practice, there are no as such organized and continually delivered education and training programs in most manufacturing industries. But training and education are the most powerful tools in shaping the leadership style. In general lack of effective education and training affected the style and performance of leaders.

History: the history of Ethiopia which has been given greater emphasis is related with war and the patriots are those who had defeated the enemy. Related with the war history, the history we now about leaders have been misunderstood. A war leader gives an order, makes decision by him and leads his force as he thought it is strategic. Taking these in consideration, leaders in the manufacturing industries, who are expected to lead the work force, tried to act like what they have been grown hearing the history of the leaders in wars. In other words the history of leadership which has been practiced before has affected the current leadership performance.

Weak supplier relationship: The importance of improving supplier quality and performance grows as companies pare down to their core competencies. Companies that want to be lean and nimble in ever flatter organizational structure strive to do only what they do best and to outsource the rest, without sacrificing quality schedule or cost. This is possible only when a company abandons its adversarial relationship with suppliers and establishes long-term partnership (George and weimerskrich, 1998). In the manufacturing industries weak supplier relation has affected the performance of the companies greatly as described earlier. The main causes for being weak relation with suppliers are selecting suppliers on price tag alone, variability of suppliers, poor information flow between the host manufacturer and suppliers.

Selecting based on price tag alone: cost of a raw material can be taken as one criterion in selecting suppliers. If it has been taken as the only parameter, the quality of the row material has a big consequence in producing quality product. Most of the Ethiopian manufacturers have no any sated supplier selection criterion which can help them to choose loyal suppliers which can be partners for a long time for the mutual benefit. Therefore, lack of supplier selection criterion in the industries has greater impact on the supplier relation and ultimately on product quality.

Variability of suppliers: as suppliers vary, crating better communication and strong relationship becomes difficult. This makes the movement towards managing quality at the source ineffective. Apart from these the manufacturer have no guarantee to have the require row material with satisfying the factory standards and with the required quantity. Variability of suppliers is also a barrier in sustaining long term relationship.

Poor information flow: in managing the supply chain, information flow and cash flows are the two most valuable ingredients. In Ethiopian firms managing the supply is still at the nursling stage and information flow between is also very poor. With those known suppliers even the information sharing and communication is very weak. If the supplier doesn't know how the customer is performing and if the manufacturer has no any idea how the supplier is performing, it is difficult to manage and create partnership with supplier. The communication means and media should be effectively structured but not still practiced effectively in Ethiopian industries. Hence,

having efficient information flow with suppliers has positive impacts on creating and sustaining strong relationships.

Unskilled manpower: the impact of education and training on improving and shaping the abilities of leadership has been described above. To create capable and skilled work force, focusing on training and education is again better solution for domestic manufacturers. The Ethiopian manufacturers have been challenged with unskilled manpower as it has been observed from the data obtained from survey. The major causes for this is that, small or no training in the manufacturing industries which is designed for updating the skills and knowledge of employees. This may also be due to lack of appropriate resource allocation for training and poor training promotion program in the companies. Apart from this lack of integrated knowledge that means integrating the theoretical knowledge with practical knowledge is one factor affecting the quality management practice. To make the new employee who has plenty of theoretical knowledge fit to work, effective training program should be structured. But in most of Ethiopian manufacturing industries, these parameters are missed.

Weak link with customers: The most important asset of any organization is its customers. An organizations success depends on how many customers, it has, how much they buy, and how often they buy satisfied customers will increase buy more frequently (Niadu, Babu and Rejendra, 2006). Having strong relationship with customer is managing the most important assets of the organization. There are several factors affecting the relation the manufacturing industries have with their customers. Some of these include: luck customer survey, poor in complaint handling, and weak communication with customer.

Lack customer survey: customer survey is an important tool to understand the market status and the perception of customers about product and service quality of a company. Most of Ethiopian manufacturers have no a structured and repeated customer survey programs. They simply plan to survey and make in practice rarely. If implemented effectively, customer survey can be an input for improving the inefficient or problem areas.

Poor complaint handling system: Obtaining customer complaint information is to seek opportunities to improve product and service quality. Quality complaints have different problems that require different actions. Lacking effective compliant handling system may result dissatisfaction and lost customers. As a result, the relation between manufacturer and the customer becomes weak. If the link between them becomes weak, the company is going in danger (become poor in competing) when potential competitors have been created. Therefore, the manufacturing industries of Ethiopia should work on having better compliant handling systems to satisfy customers so that strong link can be created. Therefore, poor complaint handling systems have adverse impacts on quality management practices.

Weak communication with customers: the communication system with customers helps to obtain information like data on field failures and service-call rates, and analysis and reporting of customer attitude trends regarding product quality. Such information is valuable for new product development. Identifying and segmenting market effectively being the primary task, the next step is structuring an effective communication and feedback channels with customers. Lacking these communication systems can affect the implementation of a quality management system to bring customer satisfaction.

4.4.2. Effects of the problem

Once the major problem and the causes with their root causes have been identified, the next step is identifying the effect of the problem. The main problem is experiencing poor quality management practices in the manufacturing industry. Some of the effects of employing poor quality management include: poor product quality, high rework and rejects, customer loss, poor productivity, and inefficient resource utilization. If the product produced by the company is poor quality and there are losses due to inefficient process and inefficient resource utilization, it can ultimately lose the competitive power. A company losing its competitive power has no longer to stay in the market rather it will be forced to be out of market. This shows that implementing better

quality management systems is the issue of survival.

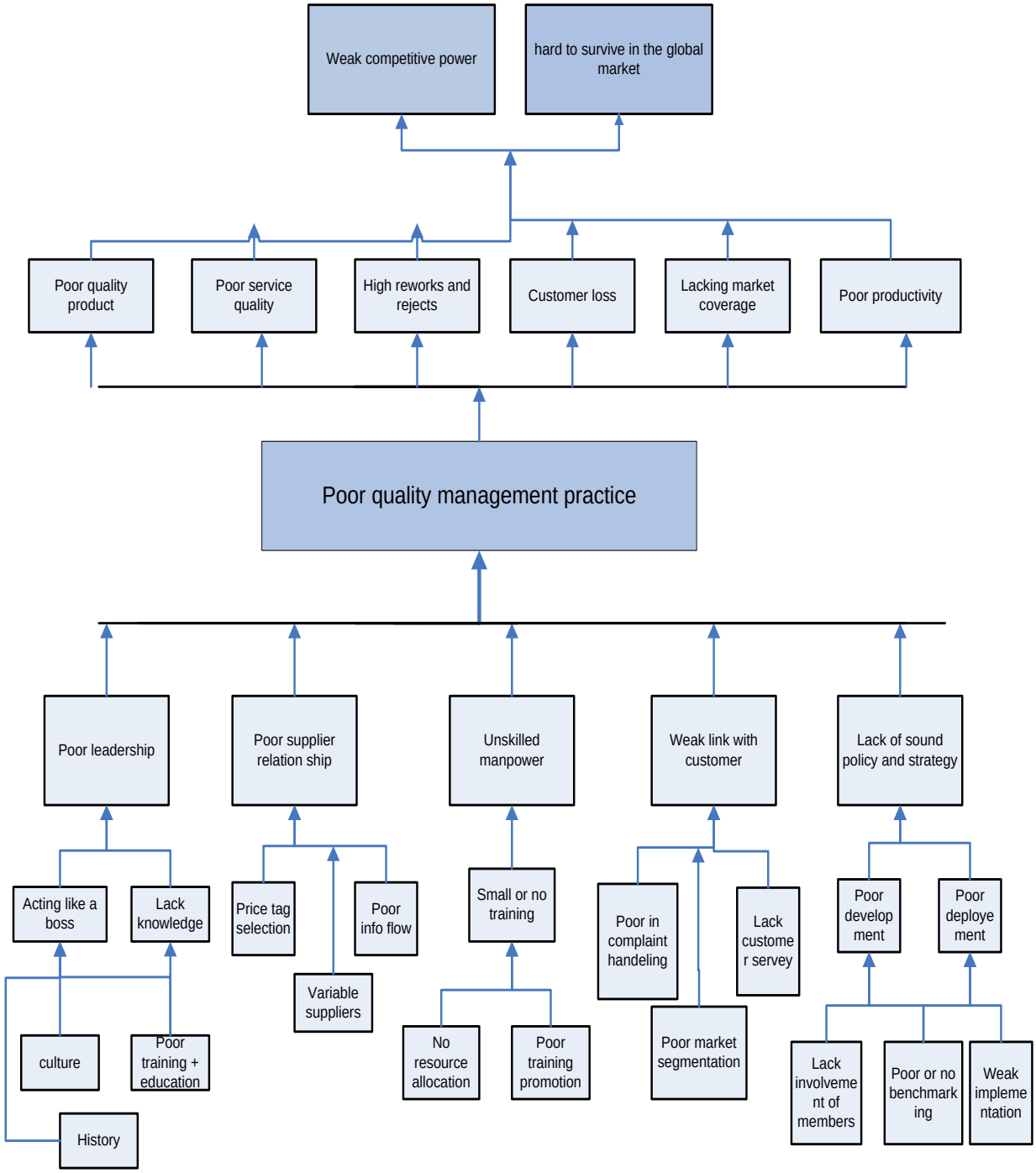

Figure 4.1: A tree diagram representing the major quality related problems of the manufacturing industries

4.5.Summery

The manufacturing industry of Ethiopia has been facing several quality related problems. Poor in practicing quality management is one of the major problems of the manufacturing industries. Having poor practice in implementing modern quality management system greatly affects the performance of the companies in the international market. If the practice goes as what is currently on ground in the manufacturing environment, it can be difficult to survive in this keen competition. The main cause for poor quality management practice include poor in leadership, weak link at supplier and customer, lack sound policies and strategies, and unskilled employee. These comprehensive causes also have root causes. Ultimately, weak practices in quality management can bring being out of market because with no any weapon, the soldier never fight with the enemy having modern means.

Chapter Five
Quality Management Practices of Harar Brewery Share Company

5.1. **Introduction**

The main objective of the case study is to understand and analyze the quality management practices, efforts employed and implementation system of HBSC. HBSC has implemented about three management systems; the ISO 9000:2000 quality management system in 2005, the Hazard Analysis and Critical Control Point (HACCP) and ISO 14001 Environmental Management System in 2007. In addition, HBSC was the winner of the EQA in 2009 and given a national recognition as a better performing local manufacturer. Most importantly, the company gives education and trainings and experience sharing for governmental organizations standing from their achievements. As a result HBSC is selected as a case to investigate its quality management efforts and achievements so that to be taken as an input for other manufacturing industries in implementing such systems. It is noted that HBSC is a business- to- customer industry and it has implemented the quality managements to bring improvements. The case of HBSC can be customized to other business-to –customer and business to business companies with little adjustments. The main difference between the business –to business and business-to-customer companies lies within the internal process. The approach implemented to optimize the process is different even within similar companies but the changes in management style and employee involvement with the way HBSC has moved can be taken easily.

5.2.**Background of HBSC**

Harar Brewery Share Company (HBSC) was established in 1984 at the historical town of Harar, 515 Km far from the Capital, Addis Ababa. The brewery is situated on an area of 112,536.48 square meters. The brewery's initial designed capacity was 200,000 hectoliter (60,000,000 Bottles) per annum and it was producing only Harar lager and draught beer. Since 1994 the brewery diversified its product and put two new brands on the market, namely Hakim stout, alcohol content 5.5 %W/v (Dark beer), and Harar Sofi, alcohol Free (malt drink). Since-2005 the Brewery carried on an intensive capacity building and among others the following are the major achievements: ISO 9001: 2000 (Quality Management system development and Implementation), Hazard Analysis & Critical Control Point (HACCP) system development and implementation,

expansion of the production capacity of the Brewery by 50 %, i.e. to 300,000Hl (90,000,000 bottles) , implementation of EMS (ISO 14001: 2004 based Environmental management system) in 2007, production and sales growth, growth of market share, profit growth, improved public image and increased export share.

According to regulation No. 65/92 HBSC can:

- Manufacture, can and bottle all kinds of beer and beverages; alcoholic or non-alcoholic
- Prepare and manufacture malt, hops, yeast, carbonic acid gas and other ingredients
- Sell its products both locally and abroad
- Construction of water line 32kms from Harar town
- Replacement of old machineries

The Sales and Delivery Channel of the company includes Direct Sales, Agent Sales and Branches at Dire Dawa Branch, Addis Ababa Coordinating Office and Shashemene Branch. Accordingly, HBSC has more than 42 loyal sales agents.

Vision of HBSC

Harar Brewery Share Company aspires to become a leading brewery in East Africa in producing high quality of beer and related beverages and being competent in the world market.

Mission of HBSC

Harar Brewery Share Company is dedicated to produce high quality of beer and other beverages using the latest technology to satisfy its customer and stakeholders both locally and internationally and gives due consideration to environmental protection.

5.3. **Quality management Efforts and practices of HBSC**

To bring better achievement in quality and productivity, different quality management practices have been undertaken in the company. These are development and implementation of ISO 9000:2000 quality management system in 2005, implementation of HACCP and implementation of Environmental management System (EMS) in 2007. Even though these systems are implemented in different period of times, they are currently implemented by integrating the three systems. Especially the QMS and HACCP systems are aligned together and changed to the Food

Safety Management System (FSMS) and a manual for FSMS has been developed and implemented. In this section the major efforts employed on key success factors by the company to improve organizational performance has been identified with detail explanation. These key success factors are leadership and management commitment, policy and strategy, resource utilization, customer focus, supply chain management, continual improvement, training and education, employee recognition and reward. All quality improvement techniques are developed and implemented to make the implementation of these success factors effective and efficient. This is on the assumption that effectively implementing these factors brings tangible results like financial strength, quality and productivity improvement and customer satisfaction. Figure 5.1 shows implemented improvement factors and the result obtained by implementing these success factors.

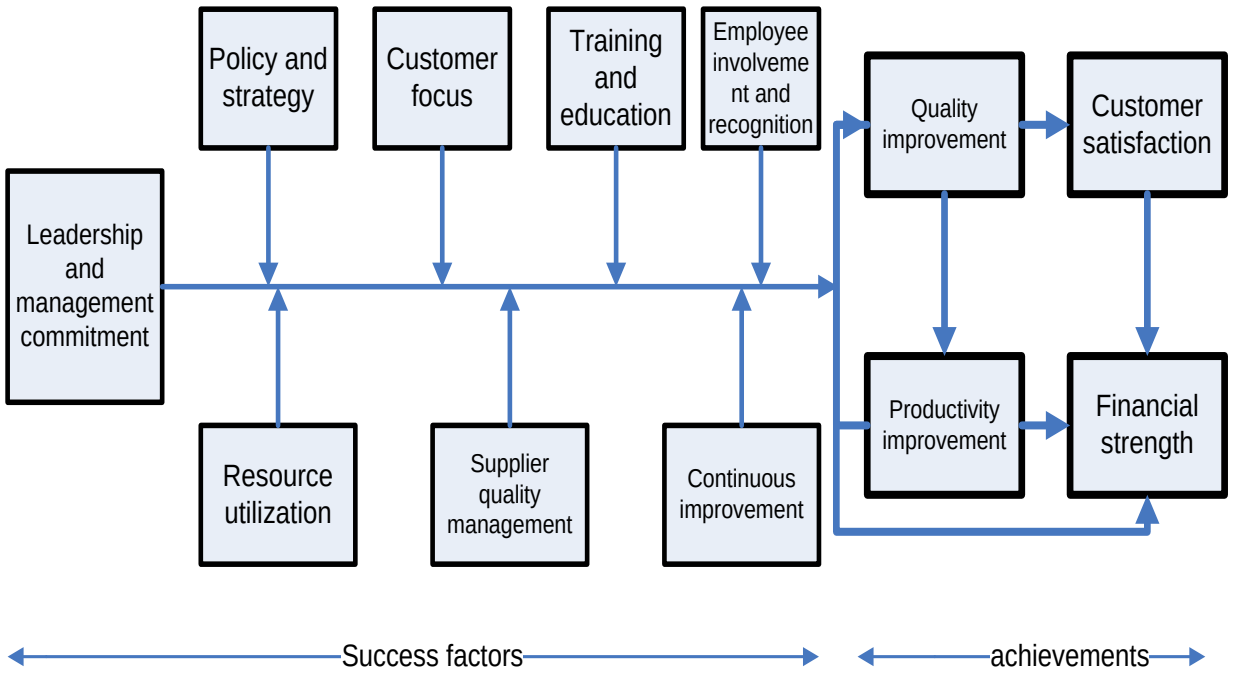

Figure 5.1: Quality management practice implementation framework

The efforts employed on each element or success factor has been described in detail. The achievements of implementing these elements/success factors are analyzed critically in the next section.

5.3.1. **Leadership and management commitment**

Leadership is one of the primary and critical determinant factors in implementing quality improvement techniques like QMS, HACCP and EMS. HBSC employed several activities in changing the attitudes and beliefs of management in implementing quality improvement systems. The major changing means are education and training for top management by experts locally as well as internationally. In order to assure leadership and management commitment HBSC has made the following efforts.

Management involvement

The management of HBSC is involved in several improvement activities. The first is the involvement and participation of management in organizing and forming quality improvement teams. As a result Leaders are members of various quality improvement teams; such as Steering team for improvement of management system, Quality and HACCP teams, Environmental management teams, ICT Team, and all leaders are leaders of task forces established in their respective department. With the dedication of the management, the following teams have been organized to improve organizational performance.

- **Steering committee**: Achievement in establishing and implementing management systems
- **Internal quality audit team**: Audit findings for continual improvement
- **Internal training team:** Awareness on established management system and operational procedures and task related training
- **KAISEN team** : Encouraged creativity and problem solving abilities
- **EMS team**: Implemented cleaner production principles, reduced environmental pollution
- **QMS & HACCP team** : Developed procedures and work instructions, Secured food safety, Improved management systems
- **Task force in all departments** : Implementation of management systems requirements at processes sites

- **Environmental acting teams**: provide awareness on safety and work environment

Top Management learning

The managements of HBSC are participated in taking and delivering trainings periodically. Accordingly, the major trainings taken and delivered by the management include: Professional related trainings such as, maintenance training, PLC, computer training, management systems training, job related awareness, occupational safety training, and etc. by taking these trainings the management has changed its attitude and acquire the necessary capacity to undertake the intended function.

Management review

The leaders and managers of HBSC perform performance reviews and initiate improvements in all functions of departments. In HBSC, performances are mainly reviewed twice per annum so as to review attainments of improvement projects and business performances. Based on improvement opportunities revealed for the period such findings will be included in the plan for further improvement. In achieving product and process quality the management works on defining processes and implementation of procedures and system based work instructions which greatly improved process quality and enhancement of product quality. Periodical Audit by Audit Team followed by Management review provided valuable inputs to support continual improvement.

Policy development and deployment

Policies and strategies are the ways in which the company can reach on its target. So, they should be carefully developed and deployed down wards. In Harar brewery, the leader (general manager), is chairperson of policy and strategy development team, provide all necessary information for policy and strategy development, allocate all the necessary resources for policy and strategy development and organize and motivate employees to implement policy and strategy. The leaders' follow-up the implementation of policies and strategies mainly once per annum and quarter review to assess the progress.

Resource allocation

Leaders allocate resources according to the strategic objectives of the organization. The main resource allocation goes for the following priority processes.

- Allocation of financial resource for human resource development, particularly to meet strategic objectives of the company
- Resources for expansion & promotion of market to maintain and expand the company's market share
- Resources for system maintenance & realization of improvement projects
- Resources to support environmental protection & conservation of natural resources.
- Resources for the rehabilitation and fulfillment of infrastructural facilities to meet company's objectives, and etc.
- Resource for training and education and R&D is also offered by the leaders of HBSC.

Apart from these, the leaders initiate full capacity utilization of the organization. For instance before improvement capacity of the filling machine was from 21,000-bottles per hour & after improvement it was raised to 25,000,bottles per hour, and labeling machine output was raised by 15 % by upgrading machinery efficiency in capacity, and through human resource development skilled and trained human resource increased by 16 % in last seven years. This is the result from management allocating resource and initiating the utilization.

Management responsibility

The managements of HBSC are responsible for both internal actions and of the public. To avoid partiality the company developed guidelines, rules and regulations to be respected. There are documented rules and regulations such as leader's guidelines, Administrative rules, collective agreement, Anti- corruption Policies etc. There are documented methods that explain how these issues are managed. Issues such as employees' recruitment, promotion, transfer; training and occupational safety and any other interest conflicts are regulated using administrative rule, developed procedures, screening criteria, Anti- corruption policy and Ethical values, and

collective agreement. Generally discrimination in relation to the stated issues is controlled and regulated by proper application and review of the stated mechanisms

The other responsibility of the management is to protect the public or society from different factors affecting them. As a result they encourage participation in community development programs, initiate environmental protection program, initiate waste disposal mechanism in the organization, participate in society conflict resolutions, and contribute in national/regional catastrophic condition for rehabilitations.

5.3.2. **Policy and strategy**

HBSC developed several policies and strategies to be implemented in the long, medium and short-term ranges. The major policies developed so far include: Quality policy, Human resource policy, financial policy, Purchasing & materials management policy, Maintenance policy, Research and Development (RD) policy and Environmental policy.

Vision and mission development

HBSC set its vision, mission, objectives and goals taking into consideration of the internal & external environments of the organization. Through SWOT analysis and environmental scanning the internal and external environmental situation are considered.

Marketing strategy

HBSC developed its marketing strategies and reviews it according to the dynamic environment. In addition to the market strategies, the company designed its order winning criteria to be a winner in the market. In order to increase its market share, HBSC perform activities like provide training on modern concepts to improve management approach to customers relations, improve quality and production volume, intensive promotional and advertisement activities, conduct market research and review and allocate sufficient resources.

5.3.3. **Resource management**

Resource management is one of the pillars in implementing improvement efforts. Any organization can be better in its class if used resources effectively and efficiently. HBSC has also

implemented some improvement systems in bringing effective and efficient utilization of resources.

Human resource planning and organizing

Since human resource is one of the major inputs in the company, HBSC developed good human resource planning and organizing systems. The first task is developing the organizational chart of the company which offers better working environment. The organization also developed documented job descriptions including qualifications, duties, responsibilities relationships and key performance indicators to use the available human resource efficiently.

Employee evaluation

HBSC have a process for reviewing and responding to ideas, suggestions, comments and complaints of all employees. As per the documented policies and procedure the employees are evaluated. The evaluation is conducted twice per annum as per developed and implemented integrated performance management systems (IPMS), company's strategies and plans evaluated against departmental plan and then at individual employees level. The implemented IPMS are developed based on the Balance Score card system.

Communication

The company developed a well-defined communication channel. To facilitate this, they developed a description manual. According to the manual, top management ensures that appropriate communication processes are established within the organization and that communication takes place regarding the effectiveness of the quality management system. This is achieved through internal auditing, training, meetings, nonconformance reports, management reviews, and any other tools that may be developed and implemented to monitor the effectiveness of the quality system or employ continual improvements. The communication documentation may include: auditing reports, analysis of data, design planning, and employee training, management communication in working areas, documented, structured meetings, bulletin boards, reports, E-mail, Internet, web sites and Employee surveys.

Financial planning

To prepare an effective financial plan, HBSC uses different methods during annual budget preparation. The main methods are projection of production/ service based on market assessment and strategic plan, projection of previous year budget by a given percentage gained from experience, replication of previous year budget and based on strategic plan. Apart from this the company is trying to assure better financial operations. To do this HBSC maintains accounting records like: receipts book, check books, cash receipt journal, cash disbursement journal, voided Checks, General Leger, Paid bills, Bank statement and Pay roll records.

Facility utilization

The company has a good facilities layout which helps to use the available capacities in facility efficiently. There are sufficient facilities acquired to meet the organization objectives in meeting customer quality expectation and product/service volume. The major facilities in HBSC include:

- ✓ ***Modern Technology*** - capable to meet product quality and quantity requirements
- ✓ ***Vehicles and tracks*** - to facilitate supply of product and Raw materials
- ✓ ***Modern laboratory Equipment*** - to ensure the fulfillment of Quality parameters
- ✓ ***Utilities*** - to secure product handling in process and during production
- ✓ ***Warehouses*** -for raw material and products
- ✓ Library and e- mail access, Fax, Telephone - access to information
- ✓ ***Buildings (offices)*** - conducive work environment
- ✓ ***Sanitation facilities and Safety devices*** - to occupation safety requirements
- ✓ ***Clinic, fire extinguisher and safety rules***- to minimize possible hazards and accidents

In addition, the company recently added new technologies to increase production capacities and to meet customer requirements.

Maintenance management

The company sets guidelines for equipment maintenance, disposal and replacements. Old equipment are disposed and replaced based on technical evaluation, developed procedures and financial policies of the company where different costing methods are employed based on the category of the Asset. Preventive maintenance with minor break-down is usually practiced and sometimes preventive maintenance with considerable corrective maintenance and "Fix it when brake" maintenance with minor lubrication are also maintenance practices. To perform maintenance of equipment monthly and annual plans are prepared in the company.

Information management

Information is now one of the valuable resources which can help to bring a significant change in firm performance and competition. In HBSC, different data are gathered, processed and stored to assist further improvement. For example, process capability study, Quality parameters, machinery efficiency, resources utilization are analyzed and used for further improvement. To assist this data analysis procedures have been developed. Technologies, skills and infrastructure for storage, maintenance processing and retrieval of information are tried to make easy for accessible. To do this, the company has established different data base management systems which enable data storing, maintaining, processing and retrieval of information. To mention some: Sales analysis, Human resource, Payroll, Ledger, Inventory control, Quality control, (process Follow up and analysis) etc.

5.3.4. Continuous improvement

Continuous improvement is one of the goals of quality improvement systems like TQM. Bringing performance improvement needs better efforts in implementing quality management tools, techniques and tools effectively. The following are some of the major quality initiatives undertaken by HBSC to bring continual improvement.

Production process

To maintain the production process safe, the company integrated the core processes and support process with better management system. The core processes are procurement and supply, production, marketing and sales whereas support processes are maintenance process, human

resource and development, finance, quality control, system productivity and corporate planning, audit service and legal service. The process is designed to meet customer requirements. Information related to customer requirements in relation to products quality are incorporated in the production process and inputs requirements are also based on national and international standards , others customers' requirements are obtained through marketing and sales process that will be transferred to the production process so as to fulfill the customer requirements. The production process is controlled based on procedures and instructions prepared and documented in the company. In relation to production processes there are established and implemented procedures such as wort production operating procedures (OP/PD/001), fermentation process operating procedures (OP/PD/002), Beer Maturation and filtration process procedures (OP/PD/003), Sanitation procedures and plan and Bottles washing follow up procedures. In all cases there are working format which are used for recording the output of the processes and used as controlling mechanism.

Product development and design

Product development is a key indicator for better performance of a company. HBSC develops and design products based on the customer need. It takes about two months to design a product and some additional time to import a new product from goring suppliers. The major phase in designing a new product is illustrated in figure 5.2.

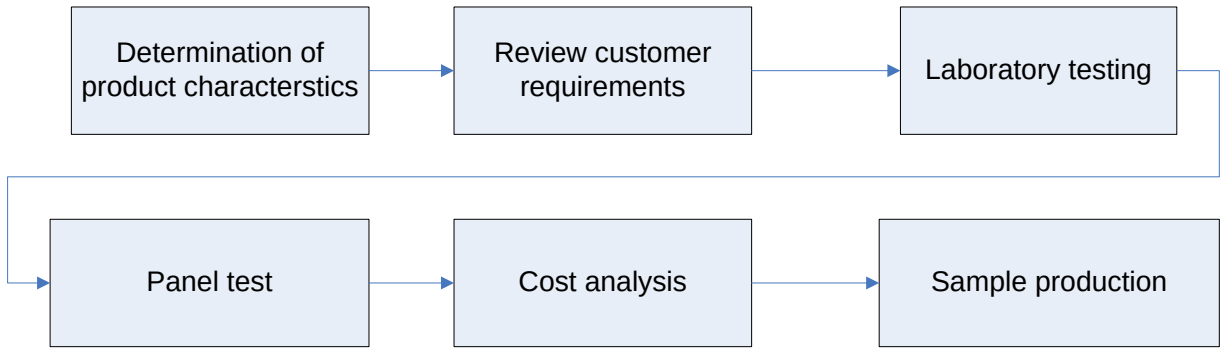

Figure 5.2: phases of product development and design

In developing a new product, the idea is discussed with customers, market research, sales person, internal research and development, vendors and rarely with competitors.

Material handling and storage

The company constructed sufficient warehouses for the storage of major inputs (direct & indirect raw materials) such as malt store, spare part store, chemical store, petroleum & oil store, stationary store, empty bottles and full bottles , crate store , HCL store ,and etc. To retrieve material efficiently and effectively; stacking discipline, item categorization, labeling, location, mainly storage of raw materials based on First in and first out method has been implemented. And to ensure formalized contact between the warehousing/distribution function and; procurement, sales, production, finance, after sales and inspection & test, proper procedures and guidelines have been established. The implemented storage procedures include appropriate methods for unloading & receipt, unpacking, sorting, handling, preservation, segregation, regular inspection of stored items and products, order picking & dispatch and meeting storage requirements. Ultimately these procedures are implemented to ensure nonconforming items and products clearly identified and where practical, segregated from the conforming items and products.

Utility supply system

Utilities are also those crucial factors in maintaining the functionality of the company. The main utilities in the company are energy, water, electricity and others. To bring improvement, audits like energy audits and make accessibility of utilities have been maintained. To improve the utility consumption, the system and corporate department is undertaking several projects like in reducing power consumption, water consumption and treatment consumptions.

Process planning

HBSC develops its process plan taking production capacity and market demand in consideration. Based on the annual plan the gap between the actual and the planned production is analyzed and corrective actions like increasing volume of alternative and substitute products shares (Malt drink& draft Beer) production has been performed. The prepared annual plan specified the quality criteria which include responsibilities and authorities during all phases of the project/production, specific procedures, methods, and work instructions and suitable testing, inspections and examinations. In addition, the processes of monitoring techniques are done properly. These include: approval of process by competent personnel, establishment of practical workman-ship standards, facilities for monitoring and control of suitable product/service characteristics and use

of suitable production, installation and service equipment. Statistical techniques like histograms are used techniques to verify process capabilities.

Inspection and control

Inspection and control is practiced extensively to identify variations in all process of HBSC. The company has comprehensive procedures and work instructions for inspection and testing activities including; receipt inspection, in process inspection and testing, final inspection and testing, first piece inspection (set up), patrol flow inspection and operator inspection. The company has developed plans, procedures & instructions so as to maintain and improve quality parameters which are developed and approved according to the national and international standards. This ensures whether the products fulfill the predefined quality parameters or not and the deviation from standards initiates corrective or preventive measures at different process sites. There are identified quality control sites at different process points where process out puts are measured and the actual results from each of these points are compared against predefined standards. There is also internal and external calibration schedule which is performed by company's laboratory personnel and Ethiopian Quality and Standards Authority for calibration of measuring instruments. To use as an input for continual improvement proper documentation and recording of all inspection and testing activities have been practiced well.

Productivity improvement

To improve productivity the company has implemented modern management systems which are designed according to national & international standards. In this regard work standards such as occupational and safety issues are addressed according to such standards. HBSC developed and implemented safety procedures, instructions, provide safety devices, regular evaluation and monitoring of safety and Hygienic Status. The company has assigned occupational safety officer who is responsible for the implementation & follows up safety issues and work standards. Besides to labor productivity, to improve material productivity, different activities have been performed. Among these: taking market survey, forecasting and customer order the organization plan for materials/stock, Material Requirements Planning extensively, reduce the scraps and wastes. For instance defective products are reduced by process improvement, mainly by identifying root causes such as under neck, over neck and empty bottles by proper maintenance of the filling

machine, bottle breakage are managed or reduced by informing the bottle manufacturer to improve quality and regulation and control of operational parameters. Lastly energy productivity is also improved by reducing gas emission and implementing electrical reactive power correction.

Capacity utilization

HBSC was using its capacity utilization to some extent until few years ago due to high machine downtimes. To improve the capacity utilization, the company reduces failure of functional processes. Currently, the company is using its 100% production capacity.

5.3.5. **Supplier quality management**

HBSC has several suppliers and suppliers' suppliers both locally and abroad. The suppliers of HBSC are shown in the figure 5.3. Row material is imported through local agents.

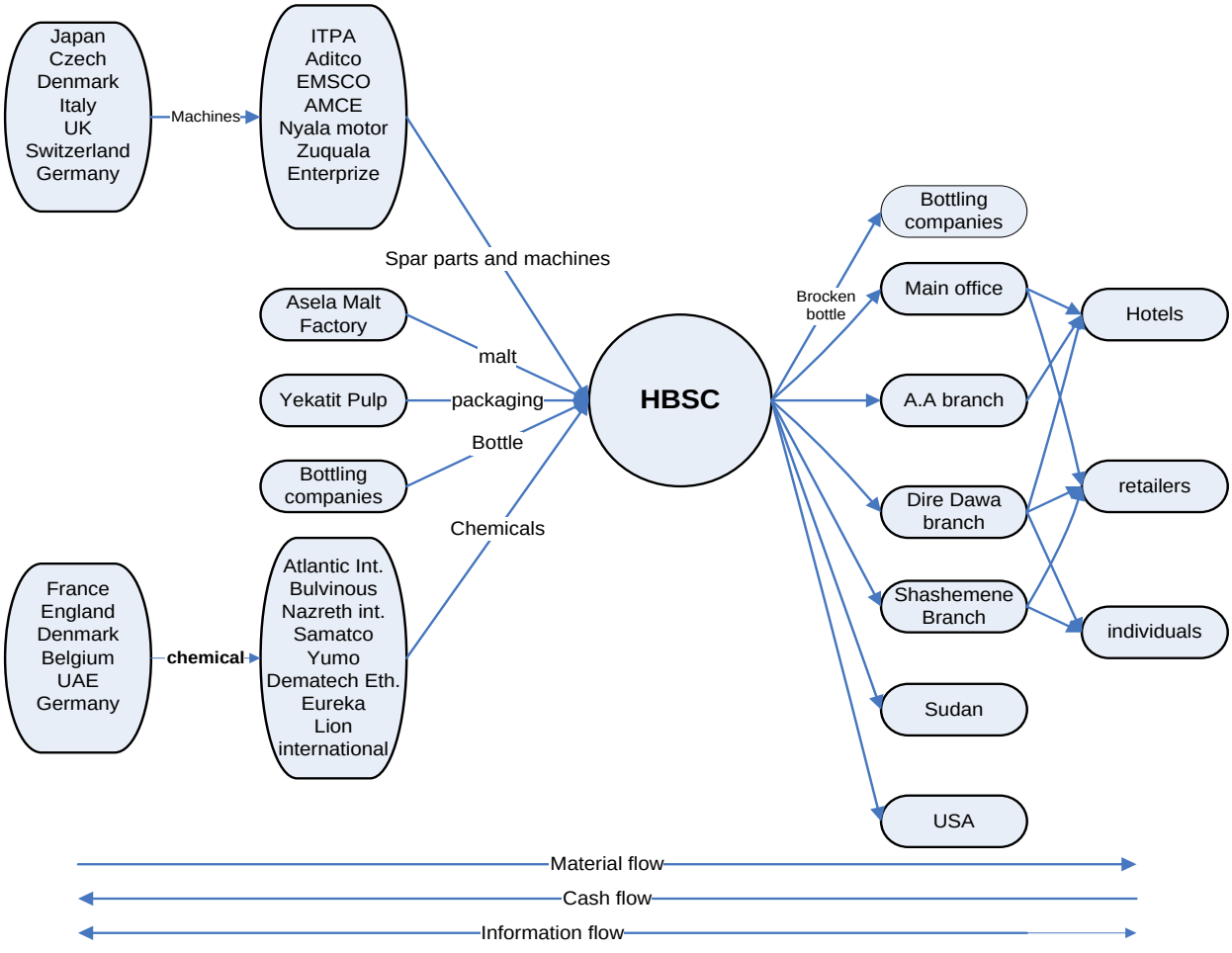

Figure 5.3: the general supply chain of HBSC

As seen in figure 5.3, spare parts and chemicals are imported from different countries through local agents. The product is distributed with branch offices and exported to Sudan and USA.

Information sharing

In HBSC information and others like financial and material flows are maintained effectively. Information sharing is maintained through different mechanisms. Among these; any payment of material and service purchase is supported by documents, charge of transporters for damage /shortage items are supported by invoices, loading and unloading workers fee information flow, Insurance claim documents, overage /shortage notification, Goods Receiving Note(GRN),Stock Issue Voucher(SIV),Returned Goods Receiving Note(RGRN),Purchase Return Note(PRN) , are major information sharing methods employed in the company.

Partnership with suppliers

There are joint efforts between suppliers and the company to improve quality of inputs and reduce cost of products, such as trial in production process and laboratory on different variety of barley malts and chemicals such as disinfectants, detergents, lubricants to reduce cost and improve quality.

Controlling quality at the source

The main local inputs for the company are malt, bottle, cork and packaging materials. But the qualities of these inputs are very low and as a result the company loss huge capital. But HBSC is working with these companies to make better quality product. For instance, the company is conducting research on barley cooperatively with Asela Malt Factory. Similar activities have been conducted with other companies like bottling companies.

5.3.6. **Customer focus/satisfaction**

Customer satisfaction is the major pillar in quality management. If customers, both internal as well as external are satisfied, better firm performance can be achieved easily. To insure customer satisfaction, HBSC implemented the following quality initiatives.

Customer identification

Internal customers, agents, retailers & wholesalers, hotels, consumers and suppliers are the major customers of HBSC. The company has better relation-ships with its internal customers and potential customers. These customers are tried to be satisfied with delivering quality product and service, management approaches to customers focus, product diversification/Malt beer, Stout, lager beer, and formulated and implemented quality policy and customer related procedures and the value created to the customers.

After sales service

To assure effectiveness of after sales service, the company performs some improvement efforts. Some of these are: Products/services delivering system are flexible to the customers' requirements, delivering operation is fast and on time, gives repair/maintenance services to its customers, gives installation services to its customers, delivers technical training for its customer after delivery, give warranty/guaranty for the products/services, goes to customer location to assess the overall conditions of its product/services and organization replaces delivered defective products or inconvenient services.

Conformance to customer needs

The organization takes and document customer requirements from National Standards, International Standard and from customer market survey. The company is working to fully satisfy its customers. Currently, customers are satisfied with the performance and functionality of the product and HBSC is working to make its products within the purchasing capacity of the customers and to make satisfied with the aesthetic value of the beer.

Customer complaint handling system

HBSC has developed documented procedures for complaint handling. For this customer feedback handling process map, summary of customer compliant and summary of end user customer satisfaction are developed and reviewed periodically. When complaints appear, HBSC discuss the complaints of the customers at all level of the organization. Mainly, it is practiced twice per annum & occasionally based on assessment reports and as complaints submitted to respective department as per to complaint handling procedure. To make the complaint handling system

effective, HBSC perform improvements like: develop a system to solve the customers' complaints, apologizes for the mistakes committed, compensates for the mistakes committed, and follows up the customers' satisfaction after corrective action and plan to continuously assess the root causes of customers' complaints.

Market search

Market search is one of the main tools in understanding the requirements of customers and customer satisfaction. The company's market positioning is mainly on geographic product requirement and to some extent on customers' future needs, requirements, and expectations. The data obtained from the market search is used in estimating or forecasting the demand of products. Survey of customers, sales force estimates, expert opinion and time series analysis are the major tools applied in forecasting the demand in HBSC.

Sales service

HBSC is working to make its products accessible to its customers easily. To assure this the company outsourced some part of its sales service. For example, HBSC outsourced sales services to sales agents using their own trucks, and as a result about 75 % of sales services are outsourced. To make the sales service better the company has established channels for communication and interface with customers. To some extent the company has translated marketing strategies and plans into implementation plans, which address the need for adequate resources in all departments, quotations/tenders, contracts, other documents relevant to customers' contracts are systematic and structured, and customers are informed of correct usage and exclusions to reduce the liability risk. In addition, organization evaluate the competence of its sales force using analyzing sales prospects, presentation and demonstration, handling of objections, follow ups, listening and interactive skills.

Review and evaluation of customer satisfaction

Top managers facilitate periodic collection of information and reviewing the perception of their stakeholders towards the organization and this is performed once in a year. Based on the information obtained, organization attempts to change the perception of its stakeholders. To achieve this, HBSC developed smooth communication channel, satisfaction of major

stakeholders, establishing soccer team, beautification of public parks and sponsorship of societal developmental activity in different trade fairs, bazaars, or telethons. Not only review the perception of the external customers but also internal customers.

Market share

HBSC has delivered its products for both local and foreign market. Company is flexible enough to respond to market changes. Such flexibility to market change may be justified by measures taken such as: Revision made to marketing approaches i.e. review of promotional and advertisement policy, exploration of new market areas and provide attention to major and target markets. To achieve market share, HBSC implemented its business plans and strategies according to the implementation schedule.

5.3.7. **Education and Training**

Education and training is one of the most influential quality initiatives to be implemented to bring continuous improvement in all processes. HBSC gives training for all stakeholders as per the responsibility taken by the employee.

Focus group

HBSC have delivered trainings for all managers and workshop staffs. The major focus groups include: top level managers, middle level managers, experts and junior experts, supporting staffs, and shop floor workers. In addition the company support and promote education to upgrade skills of employee. Accordingly, 105 participants have engaged in different fields of study till 2009. The participants are from all levels starting from top management up to shop floor worker. In addition the company facilitated employees visit to other organization both local and foreign to upgrade their skill and understanding. As a result, six top level managers and three middle level managers have visited companies in Germany, Krones, Hupmann South Africa, USA, Italy, Padovan, Kenya, Sudan, Djibouti, France and Tanzania. Also ten experts are sent to Italy, Germany and Tanzania to upgrade their skills. More than 10 local organizations, such as, Ethiopian Airlines, Breweries and wineries, East African bottling, Ambo Mineral water, Matador Addis Tyre and etc. are visited to share some experiences.

Designing and planning training

In designing and implementing training, HBSC conducts training need assessment, training places or trainers identification, training plan preparation and training effectiveness analysis. One of the responsibilities of human resource & development department is to conduct training need assessment, determination and identification of training place /institutions/ and trainers, preparation of training plan and finally analysis of the training output. So there is developed training procedure and formats for training plan, training assessment sheet.

Delivering training

Trainings are delivered based on the design program and plan. Mostly, the training is delivered by external experts and frequent evaluation of the employee is conducted if he/she has failed in implementing what is taken in the training. Appropriate media and resources are allocated for training. Top management is committed to allocate resource and participate in delivering training programs related with quality and productivity improvement.

5.3.8. Employee Involvement and Recognition

Managing the involvement of employees and achieving their recognition can bring a significant change on the performance of the employees. HBSC is currently working to maximize the employee involvement and give recognition for their decisions. The following initiatives are implemented to make employees responsible for each action undertaken within the company to fill sense of owner ship.

Job satisfaction

Bringing job satisfaction is an important parameter to increase employees' productivity. To achieve job satisfaction, HBSC performs the following activities. As a result, the company offers commission fee throughout the month for salesmen, 95% employees get incentives, additional incentives based on performance evaluation which amount to 10- 20% of employees' salary, and visit arrangement to different companies. On average amount of annual incentives reach about 2.2 million birr based on the annual employees salary. The second is rewarding hard working employees based on performance evaluation and accomplishment of a given tasks or employees creativity. The results motivate rewarded employees and initiate other workers for the better performance which result in improved productivity. Additionally HBSC; give recognition to

outstanding employees, enlarge responsibilities of the employees upon their outstanding performance, buy insurance policy for its employees, give transportation allowance/service for the employees and facilitated a means to minimize housing problems of employees.

Conducive working environment

To create working condition suitable for employees, the company is performing several activities. Among the main activities, installing air conditioning systems in rooms with relatively high temperature, established sanitary standards, safety devices, and precautionary measures at all working areas which is managed and controlled under close supervision of occupational safety professional, fulfill suitable communication facilities to its employees and prepare enough working space for movement. In addition, the company has suitable arm chairs/tables/cabinet for the workers, sufficient fire extinguishers, sufficient emergency exits, supply helmets and safety shoes for workers, clinic for first aid and/or other services in work place, safety signs and posters in appropriate places and bathrooms, hand wash, locker rooms.

Communication between employees

Employees are communicated with each other through a feedback mechanism to improve, to reject or accept preceding process mainly by discussion. Employees use different forums to discuss on different issues, besides internal training team organize awareness program on operation issues and procedures. Besides job description details, the duty of the worker and each process owner clearly explain the workers expected output as well as the amount and/ or expected quality level.

Relation-ship with management

Top managers communicate with the employees of the organization through forums, meetings & personal discussions. The major impacts of relationships are clear understanding of tasks, improved communication, meeting of organizational objectives and built trust. To make the relation smooth, yearly get-together has been celebrated with the objectives of to celebrate common achievements and appreciate team sprite, build corporate culture and to lift up existing sense of belongingness and shared value. The company also performs sport festivals, fund-rising activities and some community support services.

Employee belongingness

In HBSC employees bring the opinion of the customers to the organization to top managers, middle manager, experts, junior experts, supporting staffs or to shop floor workers easily. Likely employees give constructive suggestion to the company, have a good attitude to protect organization's property and participate in meeting and decision making.

Motivation scheme

To facilitate employee motivation based on the record of his/her performance, the company keep information like employment data, education, training attended, promotion, performance evaluation and disciplinary measures. The information obtained from these records is taken as an input for motivating them. Basically, the motivation is based on employee performance and the motivating factors are salary increment, position promotion and training opportunities. To increase productivity of less performing workers, HBSC conducted internal and external job related trainings and forums, and make available opportunity to upgrade employees' educational level.

5.3.9. Summery

Generally, in implementing quality improvement systems, HBSC employed good efforts and tried to integrate the members of the organization for better organizational achievement. HBSC implemented and practiced different quality initiatives to implement those success factors described above. The major efforts employed include: 1) the management is working interactively with employees and taking different trainings to be committed for quality, 2) there is involvement of top management and other middle level managers and in some extent employees in policy development, 3) there is an effort to bring cooperation in utilizing resources effectively by organizing different project teams, 4) there is better practice in managing the supply chain by working jointly with suppliers in solving problems of poor quality row material, 5) different process improvements and teams working on improving the process have been designed to bring continuous process improvement, 6) great emphasis has been given for human resource development and trainings, education and company visits have been undertaken to improve skill level of members of the organization, 7) different bones schemes and good incentive mechanisms

have been arranged to create internal customer satisfaction. To sum HBSC has been worked to bring total organizational involvement by employing different initiatives.

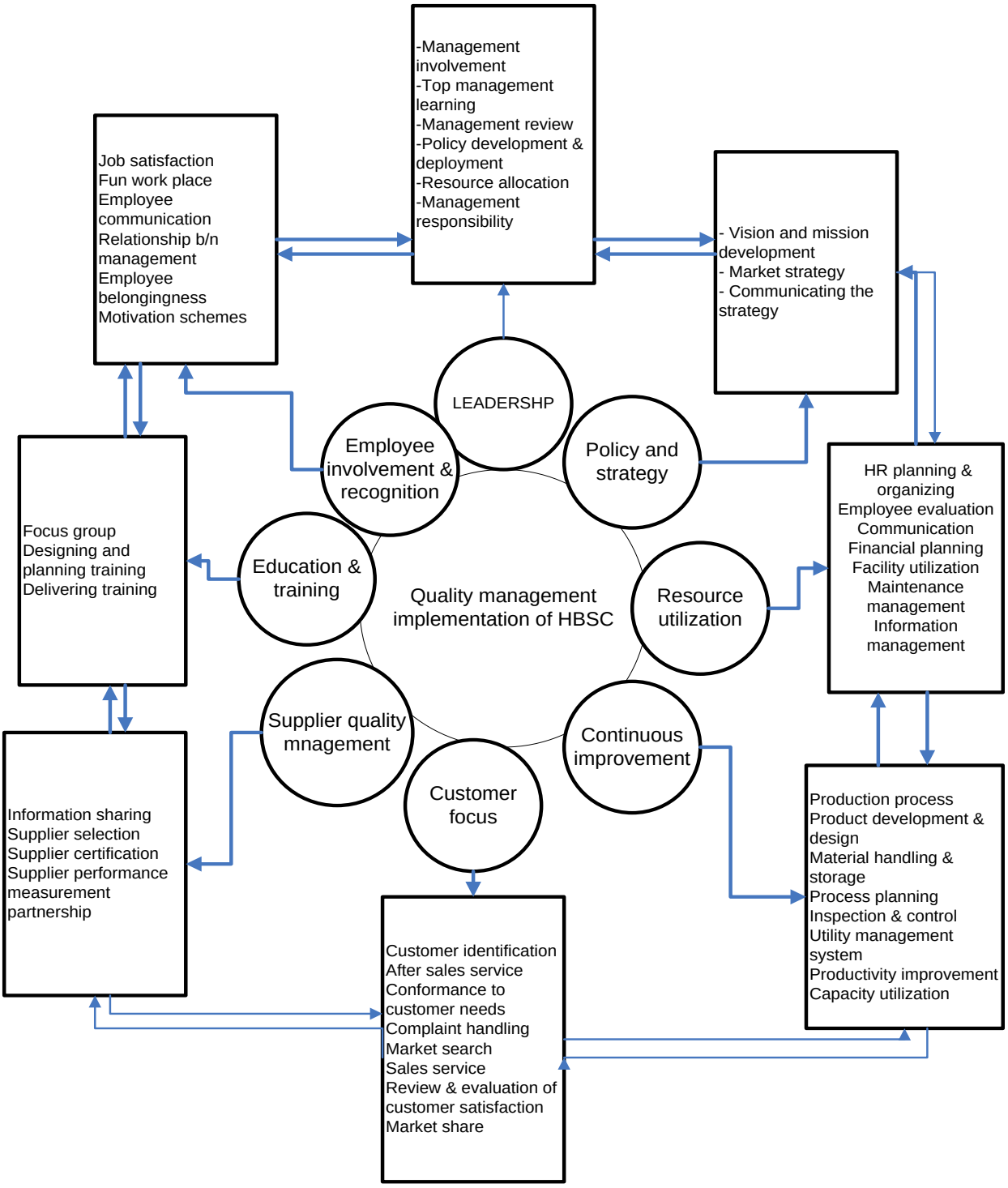

Figure 5.4: Quality management implementation practices of HBSC

Implementation process of quality management systems of HBSC

HBSC has implemented QMS, HCCP and EMS by developing an implementation procedure. Each technique requires its own detail procedures. The general implementation procedure of the company is highlighted as follow.

1. ***Secure management commitment***: includes establishing QMS, HCCCP and EMS policy and objectives and communicate with employees, resource allocation, defining responsibilities and authorities and periodical management reviews and progress follow ups.

2. ***Assign management representative***: top management assigned a management representative who reports directly to the general manager irrespective of other responsibility. In HBSC the quality control head is the management representative currently.

3. ***Form steering committee***: it is formed to cover different disciplines which will contribute a lot to the system. The steering committee of HBSC has six members and comprised from quality control section head, sales section head, market researcher, system administrator, S/microbiologist and brew technology section head. The structure of steering committee for QMS and HCCP implementation is shown in figure 10 below.

4. ***Delivering training***: training has been given extensively by consultants.

5. ***Carry out Gap analysis***: the management and task forces of HBSC have identified key processes which affect the quality of product and service. Then develop the controlling mechanisms to make sure they are performed as per the specification.

6. ***Develop policies***: appropriate policies and objectives for QMS and HCCP by incorporating major components of policies.

7. ***Documentation***: after developing policies and strategies, HBSC developed QMS manual and HACCP plan.

8. ***Planning for implementation***: identify requirements and pre-request program, plan for implement and then audit and review to maintain to continually improve the system

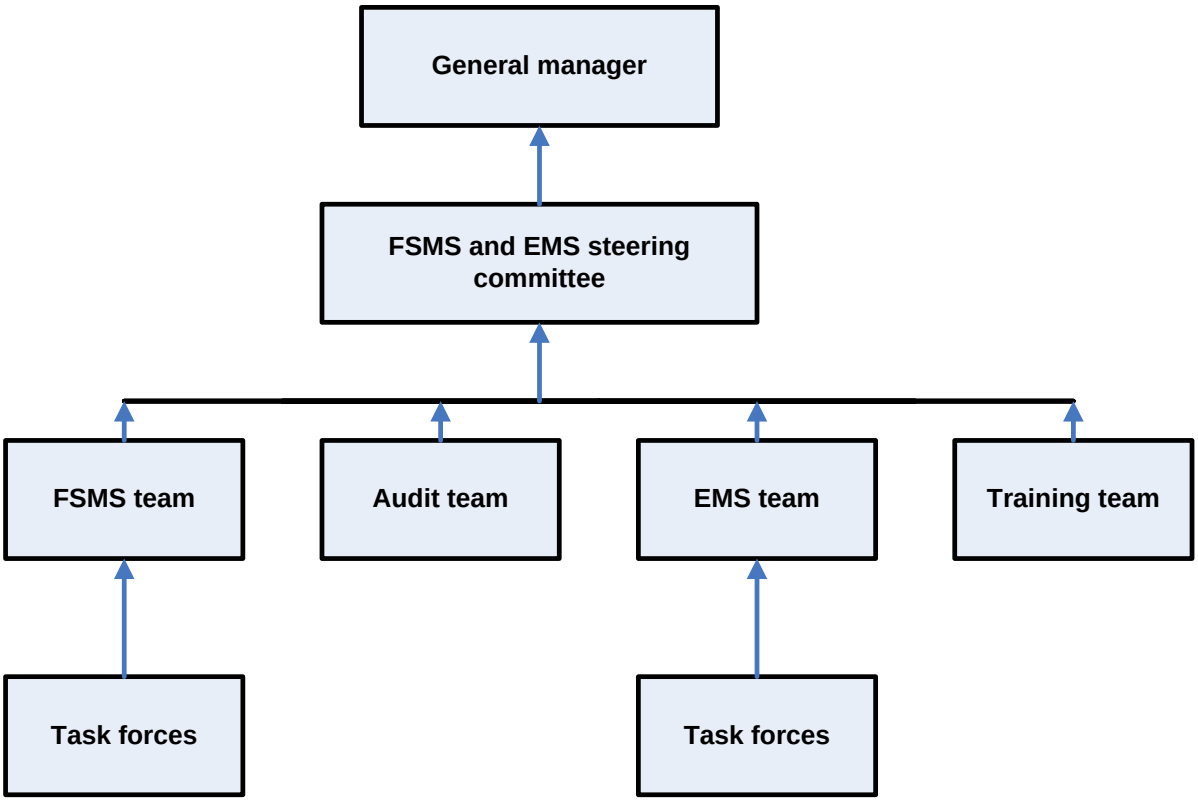

Figure 5.5: Structure of steering committee to implement QMS, HCCP and EMS

The procedure for the implementation of the management systems has been presented in the figure 5.6.

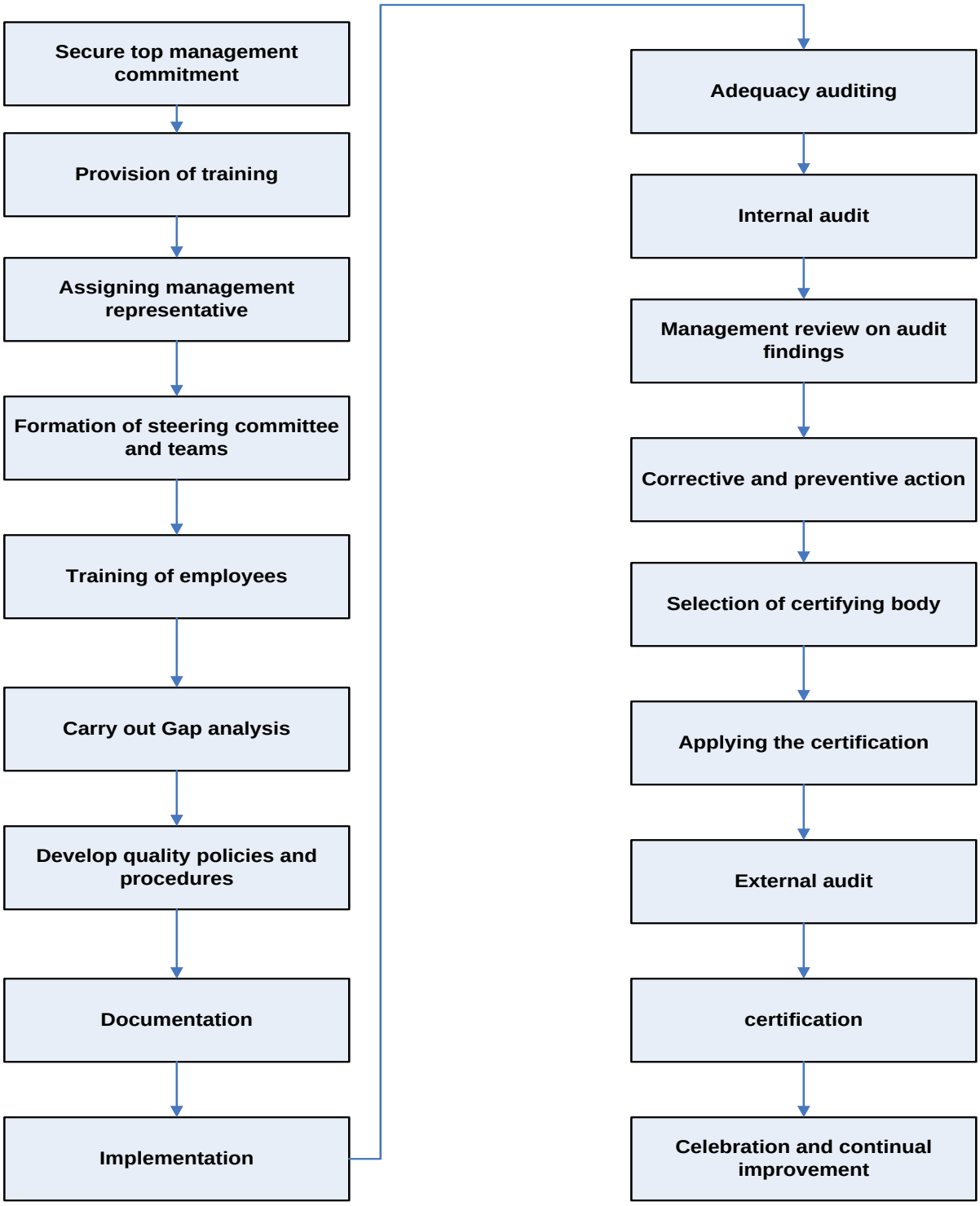

Figure 5.6: Quality management system implementation of HBSC

5.4. **Major achievements of HBSC**

HBSC has benefited by implementing those quality improvement techniques like ISO 9000:2000, HACCP, and the EQA self-assessment manual. The impact of TQM implementation on overall performance of the company is summarized by four main results or achievements. These are: quality improvement, productivity improvement, customer satisfaction and financial strength. Each of these achievements are interrelated and integrated with each other and the impact of each quality initiatives on these achievements can be analyzed in this section. In analyzing the impacts and major achievements, a clear understanding about the relationships between the success factors, key performance indicators and verifiable indicators and ultimately the measures of the overall firm performance is essential. Success factors are those elements implemented to achieve improvements in quality, productivity, financial strength and customer satisfaction. Key performance indicators are those measures which are used to quantify success factors. These key performance indicators are verified by verifiable indicators. In figure 5.7, the success factors are: Leadership, Employee involvement, Customer focus, Supplier quality management, Resource utilization, Education and training, Policy and strategy, and Continuous process improvement. While key performance indicators in HBSC include: reducing defective product, new technology acquisition, cost saving, customer satisfaction, schedule adherence, cycle time reduction, reduction in down time, increased skill level and waste minimization. Figure 5.7 illustrates the relationship and integration of all indicators to achieve better firm performance.

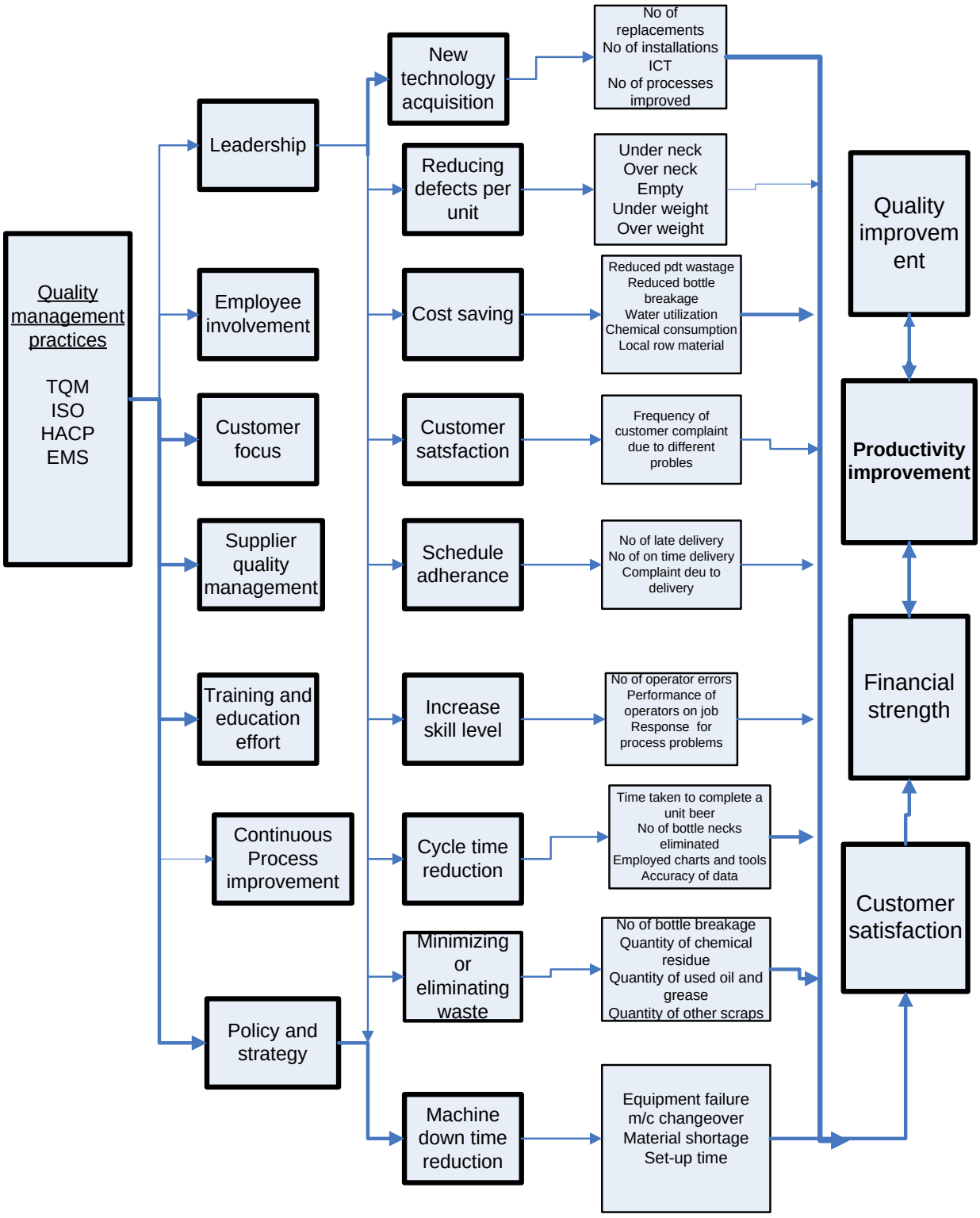

Figure 5.7: relation between success factors and key performance indicators of HBSC

5.4.1. **Financial strength**

Financial strength is one of the major achievements in implementing quality improvement systems like ISO, HACCP, EMS and TQM. The financial performance of HBSC for respective six years is shown in table 5.1.

Table 5.1: financial performance (‘000) of HBSC

	2010/2011	2009/2010	2009/2008	2008/2007	2007/2006	2006/2005
Total asset	331,051	340,663	337,146	343,285	289,762	259,935
Liability	171,832	184,139	181,369	188,508	-	-
Profit before tax	74,151	24,744	27,210	27,163	22,011.6	20,573.5

Graphically the financial performance for the past six years have been drown as seen below by taking the profit of the company before tax. The profit in year 2010/11 is very large and this may be from different reasons like training delivered, advertisement and promotion, sales volume increment, demand, resource utilization and technology acquisition. The major factors contributed for the increment of the profit has been analyzed in detail here.

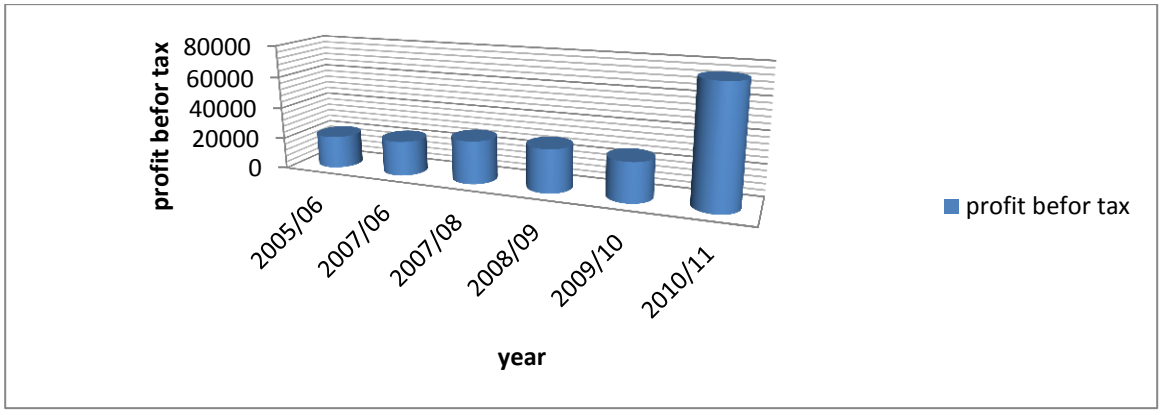

Figure 5.8: profit before tax (‘000) of HBSC

There are several factors that can have an impact to bring better financial performance. Among the major input variables sales and production volume, demand, training and education, advertisement and promotion, and efficient resource utilization are illustrated.

The relation-ship between the profit, training cost and advertisement cost is shown in figures 5.9, 5.10 and 5.11 below. From the graph it can be observed that, profit and advertisement costs have positive relation-ship. The relation between training cost and profit also is positive but weak relation.

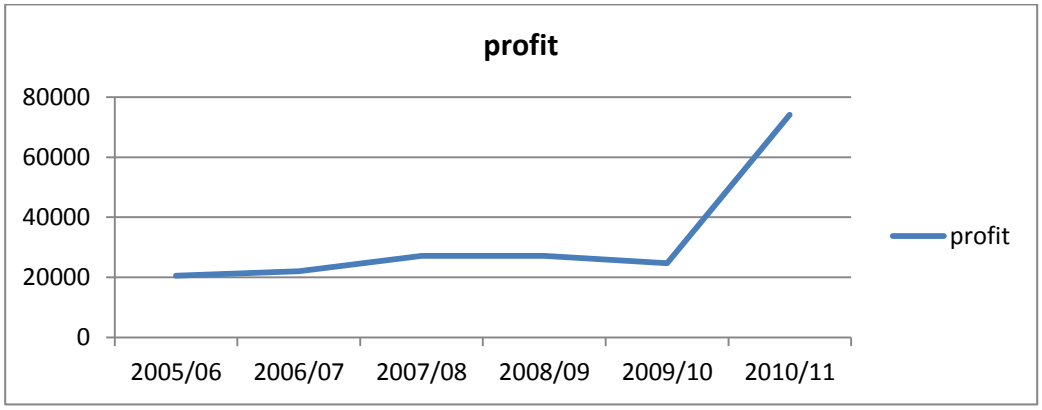

Figure 5.9: profit before tax for the past six years

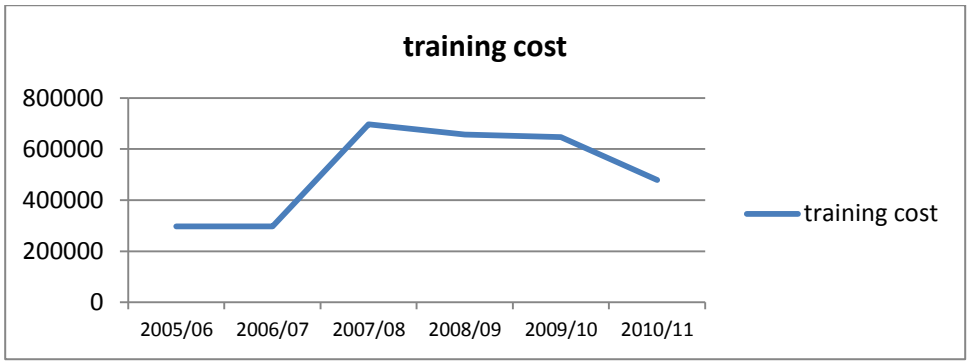

Figure 5.10: training cost for the past five years

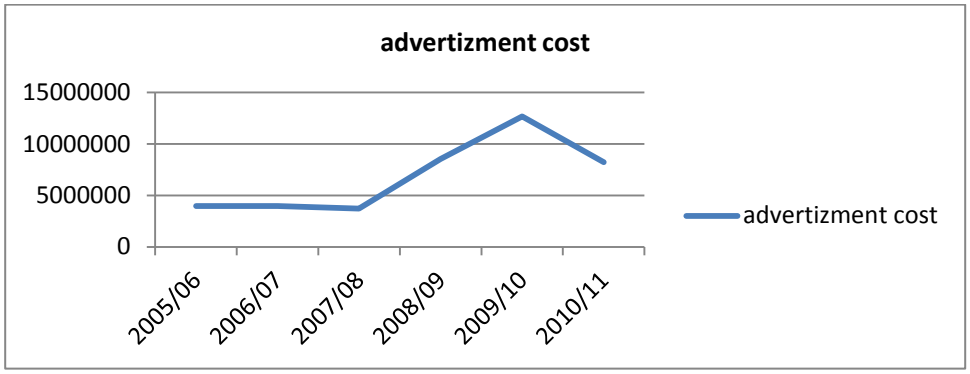

Figure 5.11: Advertisement cost for the last five years

In 2010/11, the advertising and promotion cost has decreased while the profit has increased significantly. This doesn't mean that promotion has no impact on the profit gain in that specific year but the promotion and advertisement done in 2009/10 has a greater impact on the performance of the company in 2010/11. In addition, the training and education cost is decreasing from year to year after 2007/08. This means that until 2007/08, training and education has been delivered extensively and as a result the employee within the company acquired the necessary skill and knowledge. From year 2007/08 and onwards, the cost incurred for training has been lowered. Being the training cost lower in the past two years doesn't indicate as it has not any impact on the financial performance of the company. This is because the employees are working better due to the training and education taken before the past two years and now they are capable to work their duties better than what was before now. Therefore, training and education and advertising and promotion have a significant contribution for the financial performance of HBSC.

The financial strength can also be associated with the demand of product and sales volume. The relationship between these factors is analyzed as follow. In figure 5.12, as sales volume increases, profit also increases which means there is a positive relation-ship. Comparing the sales performance of the last three years, the sales volume in 2010/11 showed an increment by ***8,688,782*** bottles from 2009/10 and ***17,672,686*** bottles as compared to the sales volume of 208/09. That means the sales volume contributes a lot in bringing higher profit in year 2010/11. The relationship between profit and demand is also positive but the demand is constant for the last three successive years. The demand doesn't show as such increment in the last successive years but the financial performance increased abruptly in these years.

The other contributing factor for the abrupt increment of the profit in year 2010/11 is that the price change for the product. That means comparing the price of the products within the past two years, the price raised to ***3.976 birr*** per unit in 2010/11 from where it was ***3.543 birr*** in year 2009/10. Therefore the change in price is ***0.433 birr*** which can bring tremendous effect on profit. Therefore price change by itself is one contributing factor for financial increment.

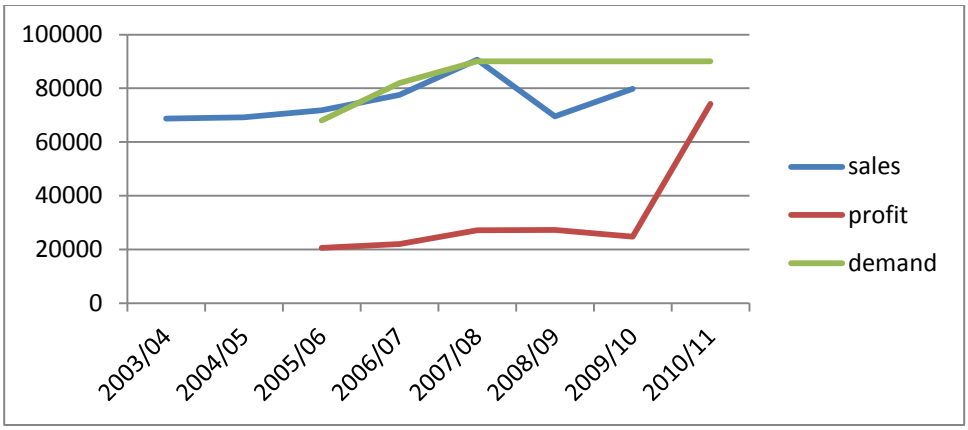

Figure 5.12: relation between profit, sales volume and demand

As it can be observed from figure 5.12, the demand increased for the first three years and the profit also has been increasing. But the demand is almost constant for the past three years but the profit is still increasing. From this, it can be concluded that the demand has no as such significant contribution on profit achieved in 2010/11.

The sales volume is on average increasing from year to year and it has positive relationship with profit. Until 2009/10, the profit increases as sales volume increases. Since the sales data for 2010/11 is not completed, it does not incorporated here but hopefully the sales volume has been increased. Therefore an increment in sales volume has a significant impact on financial achievement.

Resource utilization also played a significant contribution to the financial performance of HBSC. Some main effectively utilized resources are bottle, capacity, water treatment consumption and water consumption. The major activities performed in utilizing resources effectively include: awareness training water and other resource utilization, full capacity utilization, boiler replacement and insulating material that affect power and steam consumptions. The utilizations and reduction of these resources has been analyzed as follow.

Reduction in bottle breakage: bottle breakage is reduced by improving the production process and working together with bottling companies to improve bottle quality. As seen from figure 5.13, the bottle breakage has been reduced to 0.42% in 2010/11 form where it was 0.76% in 2005/06. This means there is saving of ***712, 927.06 birr*** which was incurred for bottles to be broken. The percentage reduction in bottle breakage is presented in the following graph.

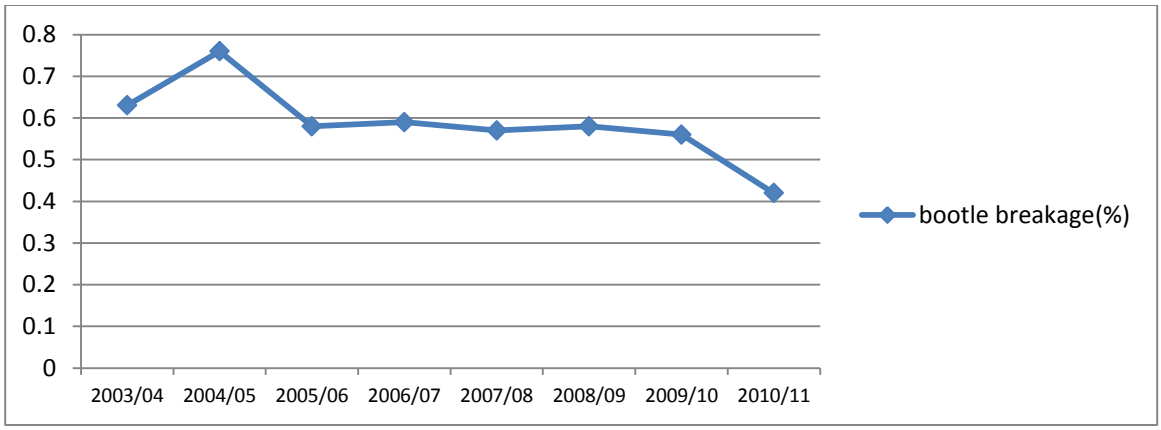

Figure 5.13: reduction in bottle breakage

Capacity utilization: the capacity is currently used its full production potential by minimizing downtime, replacing old machines and employing effective maintenance planning. As a result the capacity utilization has been increased for the past three successive years. Utilizing the capacity effectively has a significant contribution for increment of the profit. To understand the value of capacity increment, take first the capacity at 2008/09 which was 85% and then the capacity at 2009/10 which was 92%. The increment in capacity here is 92-85= 7% and this can be changed to the increment in product as 7% * production volume of 2009/10= 7% *82,673,086 which is an increment of ***5, 787,116 bottles*** of beer. And converting to revenue, increment in revenue = 5, 787,116* 3.543birr/unit of beer = ***19,849,807*** birr. That means increasing the capacity utilization by 7% results an increase of revenue. Using similar analysis increment in capacity utilization in 2010/11 by 8% resulted revenue to increase by ***21,364,350*** birr as compared to the previous year performance. The increment in capacity utilization has been presented in figure 5.14.

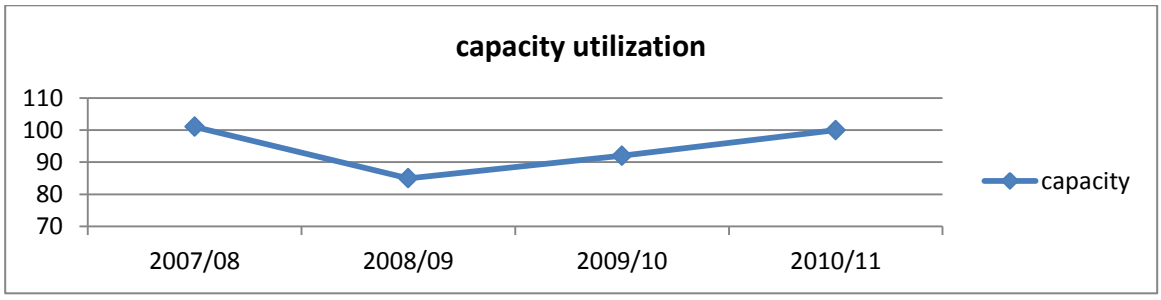

Figure 5.14: trend of capacity utilization

Down times	2010/11	2009/10	2008/09	2007/08	2006/07	2005/06	2004/05	2003/04
Total downtime	844:55	907:10	1485:15	935:25	1007:30	1007:30	1130:35	1276:35
Lost production (%)	0.24	0.26	0.423	0.266	0.286	0.286	0.321	0.363
Total production (bottles)	67,166,595	82,673,086	72,207,407	90,853,579	79,401,664	72,918,744	69,532,678	69,075,109
Lost production (bottles)	161,200	214,950	305,437	241,670	227,088	208,547	223,200	250,742
Cost saved(birr)	**+213,710**	**+310,370.4**	**-218720.8**	**-50,016.26**	**-63,595.63**	**+50,259.79**	**+94,469.06**	-

The other contributing factor for the financial performance is the ***reduction in down time***. By minimizing, down time the company reduced the lost production of beer. The lost production percentage reduction is shown with figure 5.15. The production lost has been reduced to 0.24% in 2010/11 from 0.363% which was in 2003/2004. Therefore, reduction in down time has its own contribution for the success of the company in achieving better financial strength.

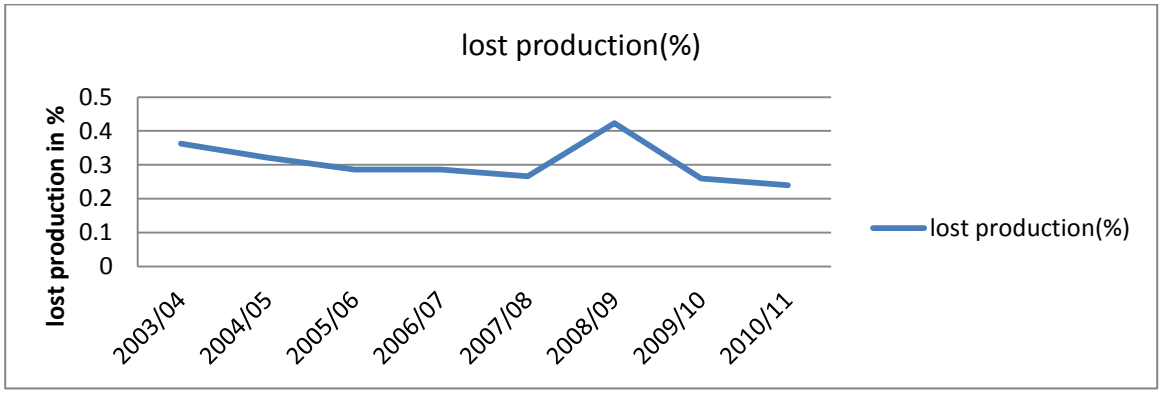

Figure 5.15: reduction in lost percentage production

As it can be observed it can be observed from figure 5.15 and from the table 5.2 above, the down time was maximum in 2008/09 and as a result, the company has lost 218,720.8 birr as compared to the previous year 2007/08. But from year 2009/10 and onwards the company can save 310,370.4 birr and 213,710 birr in year 2009/10 and 2010/11 respectively by minimizing downtimes. These values in the table 5.2 are calculated as follow.

1. Identify down times in hours for each respective years

2. Calculate percentage lost production by dividing the downtime per year to the available working hour per year. There are 220 working days and 8hour per shift with two shifts.

$$percentage\ lost\ production = \frac{downtime}{220 * 8 * 2} * 100$$

3. Calculate lost production in bottles by multiplying the production volume with percentage lost production
4. Calculate saved cost by subtracting the lost production from the immediate former year and multiply by the unit price.

Generally, the downtime is reducing currently but still it needs further investigation to minimize the existing causes for downtime.

New technology acquisition is also among the contributing factors for financial performance. In the past five years HBSC is almost replacing new technologies, systems and ICTs to improve the performance of the company further. As a result the company improved brew house capacity from 4brew/24hours to 8brew/24 hours replaced and added about six types of tanks. In addition to facilitate the business process performance, the company is establishing database system to each department and now a one general database is being built.

Generally, HBSC achieved better financial performance by implementing quality management practices. Accordingly the total asset and the profit of the company are increasing from year to year. The major contributing factors for this achievement are focusing on training and education, increasing the sales and production volume, giving emphasis on efficient resource utilization and conducting promotional and advertisement tasks. Figure 5.16 summarizes the main focus areas in improving the financial performance of the company.

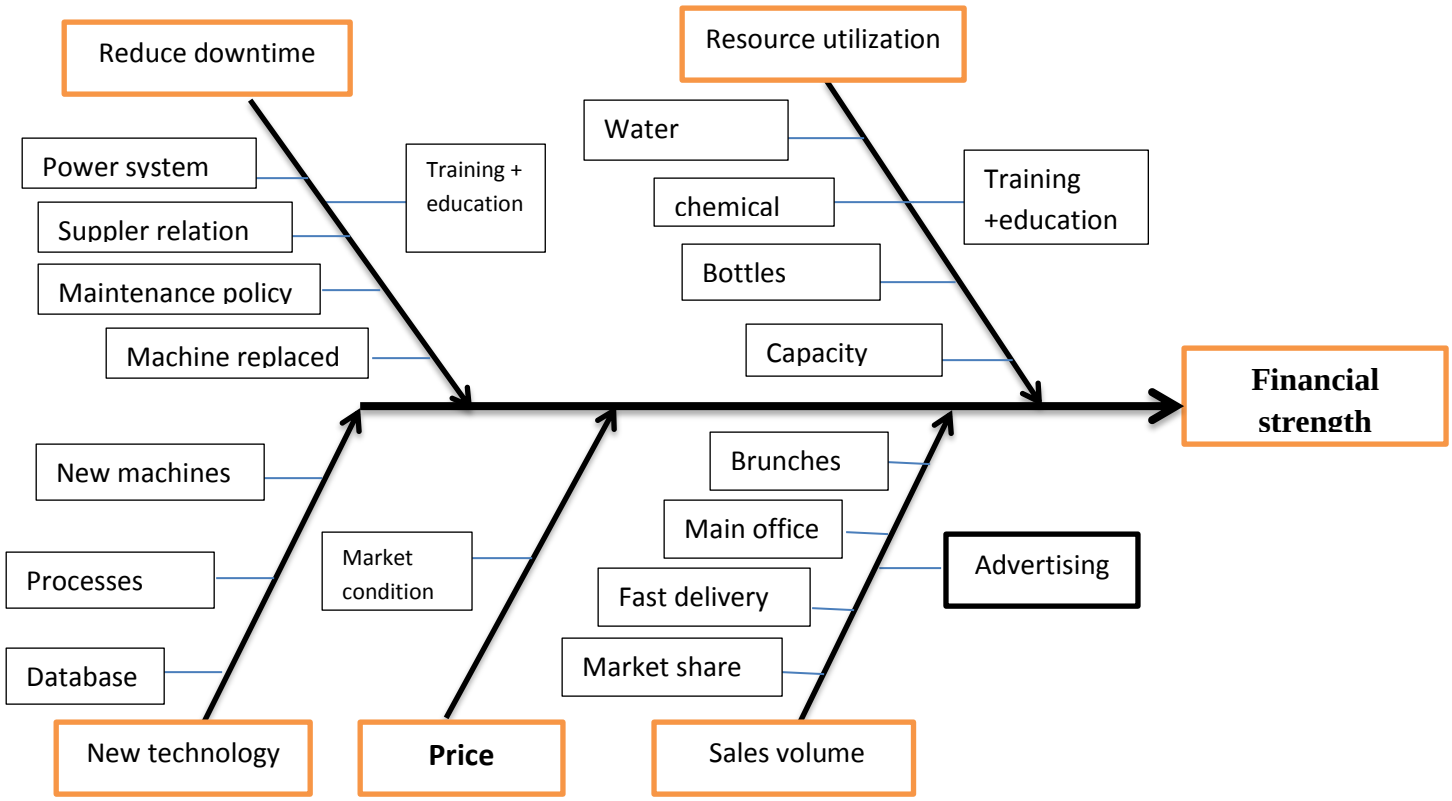

Figure 5.16: summery of factors contributed to financial performance

5.4.2. Quality improvement

Product quality is measured mainly with the process variation and reduction in defective products. The variation in the production process is kept stable. The quality control department, using its physical and chemical laboratories conducts incoming inspection, in process inspection and finished product inspection. The main inspection and control areas are the storage cellar, brew house and bottling. The major quality parameters to be inspected in all the three stages of production process are shown in figure 5.17 below. In this section the reduction in the variation of process considering last year (2010) and current data (2011) has been analyzed and reduction in defective product by employing those quality management practices has been analyzed critically.

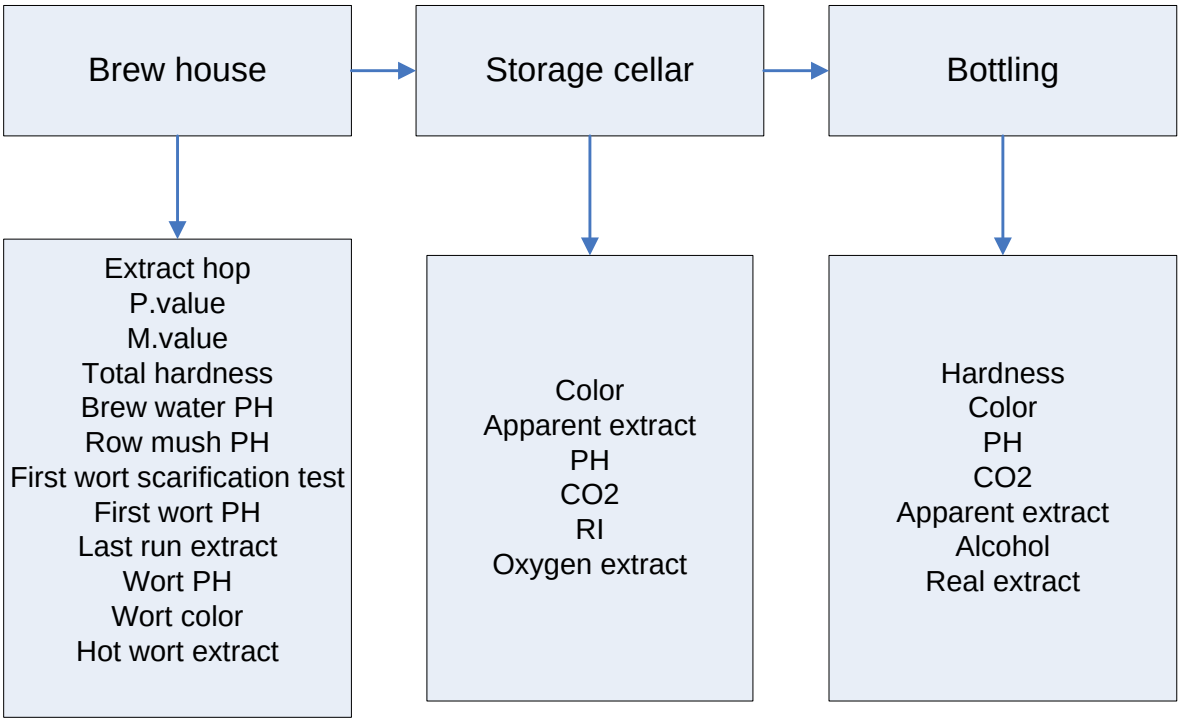

Figure 5.17: quality parameters to be measured in production process of HBSC

HBSC is normally applied the European Brewery Convention (EBC) as a standard. Based on the EBC and national standards, the company sated the following specifications for each quality parameter. Based on the standards, the quality department personnel measure and check whether the product meet the specification or not. Accordingly quarterly and annual reports have been prepared.

Table 5.3: factory standards of quality parameters

parameter		PH	Co2	A.ext.	Or.ext	color	Haziness	Real.ext	TH	Mv
Standard For	RM	7.3-7.5	Min.0.45	Min.2.0	Min.11.5	11.5-12.5	-	Min. 3.5	Min.3.5	1.2-2.0
	PDt	4.2-4.6	0.5-0.6	Min.2.0	Min.11.5	7-11	<0.5	-	-	

Based on the factory standard, the quality department takes the measurement and recorded the data for analysis. After analyzing the data, a report is prepared quarterly. As seen from the report, only quarterly average values have been presented and it lacks detail analysis of variation. Using the concept of SQC, the ***variation in process*** has been analyzed as shown below for production of one year and compared with the variation of the process in its current performance. Taking the

PH as a parameter, the control charts have been analyzed for the sample parameters in each process stage. The control chart for PH value in brew house, storage cellar and bottling process have been drown and interpreted according to the company standard and the resulted chart.

A. Brewing house

The control chart for the PH value of the raw material has been shown using the X bar chart and R chart respectively by taking the recorded data for one year.

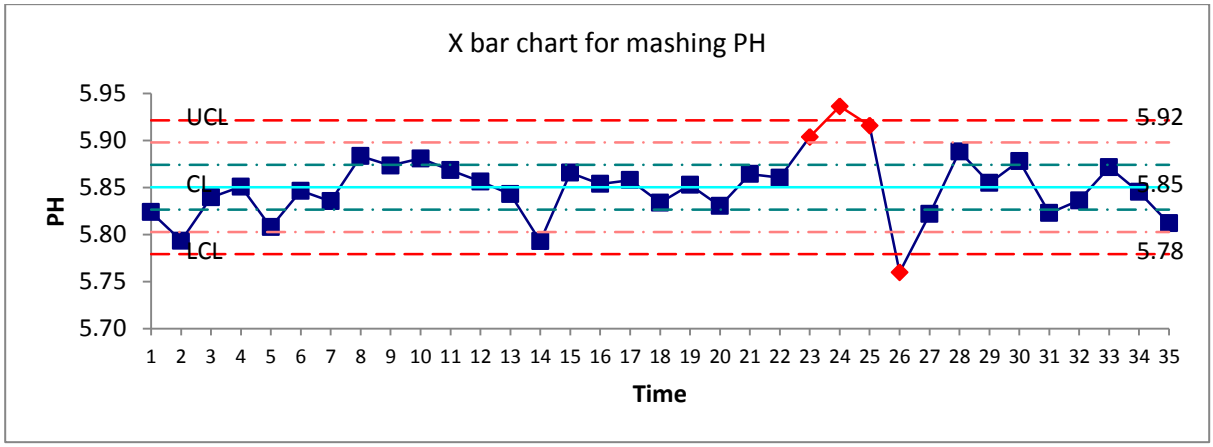

Figure 5.18: X bar chart for Mash PH in Brewing process

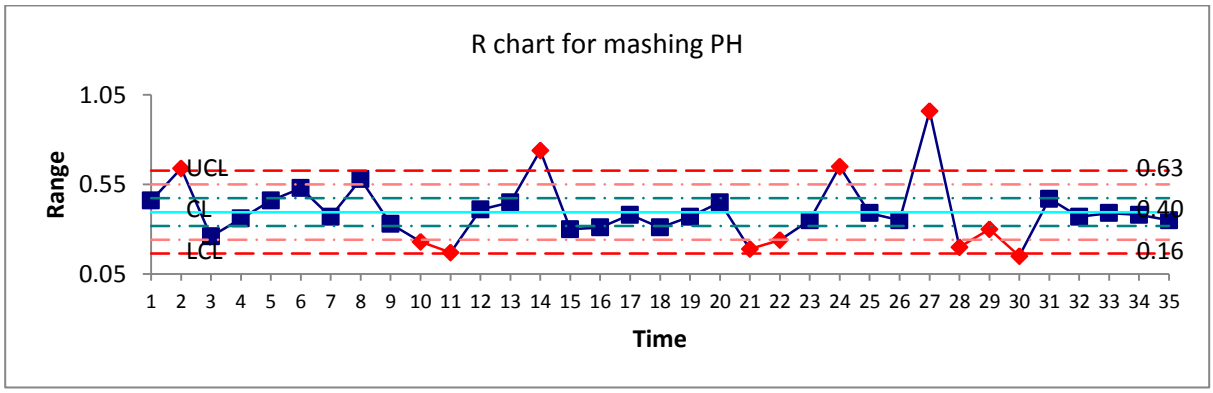

Figure 5.19: R chart for Raw material PH in brew section

As observed in the X bar chart, there are only two points out of the control limits while the majority of the points fall within the control limit. From trend of the control chart, it is possible to conclude that the process is in control. When categorized, 60.5% points fail under 1sigma region while 23.8% of points fall within 2sigma region and 10.5% of points are in 3sigma region. But, two points are outside the control limits. The problem for those out of control points is sanitation

of mashing materials and is corrected by cleaning the materials. So the process is almost stable. The factory standard for mashing PH is between **5.3-5.8** while the variation in the chart falls between **5.78-5.92**. These shows, HBSC should work further to meet the factory standard.

The current variation of the brew house process is analyzed by taking a three month data as the chart has been shown in figure 5.20 and 5.21.

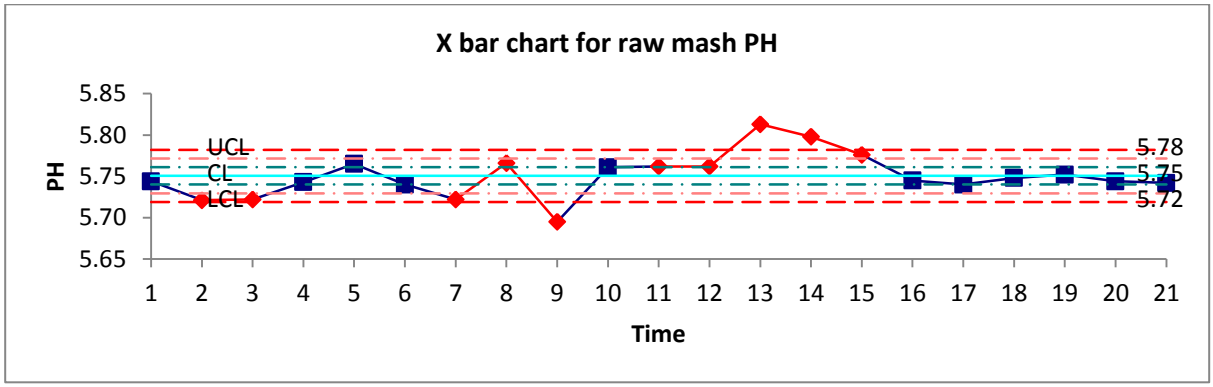

Figure 5.20: X bar chart for raw mash PH in brew section using current data

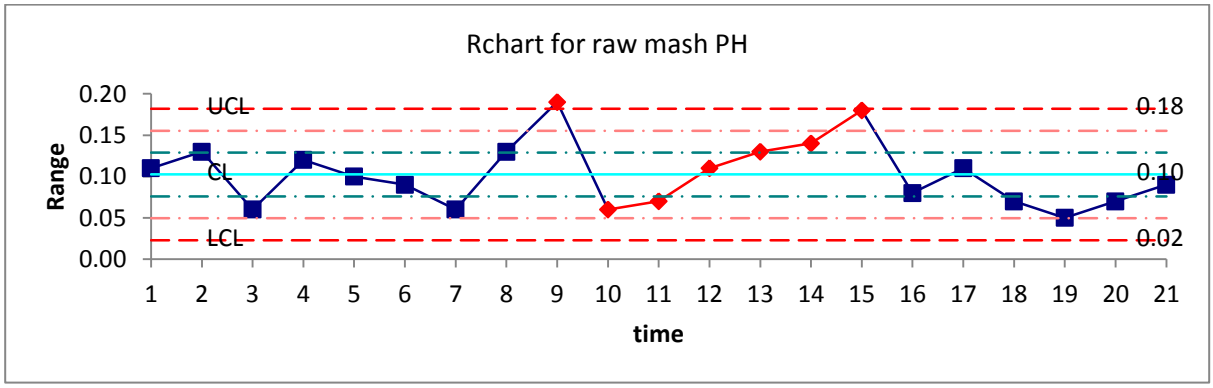

Figure 5.21: R Chart for raw mashing PH for the last three months

The current variation of the brew house process is analyzed by taking a three month data. As it can be observed from the control chart, there is a strong variation in the brew house process. The specification limits of the control chart are between **5.72 and 5.78**. This shows that the process is as per the factory's specification limit. Because ***5.3<5.72<5.78<5.8***. Satisfying the factory standard doesn't indicate that the process is in control but it is a good effort to meet the specification limit. The company should identify the causes of variation in the brewing section to make the process stable and under control.

B. Storage cellar

The variation for the storage cellar has been analyzed by taking the cellar PH as a parameter and taking the recorded data for one year. The X bar and R charts have been given in figure 5.22 and 5.23.

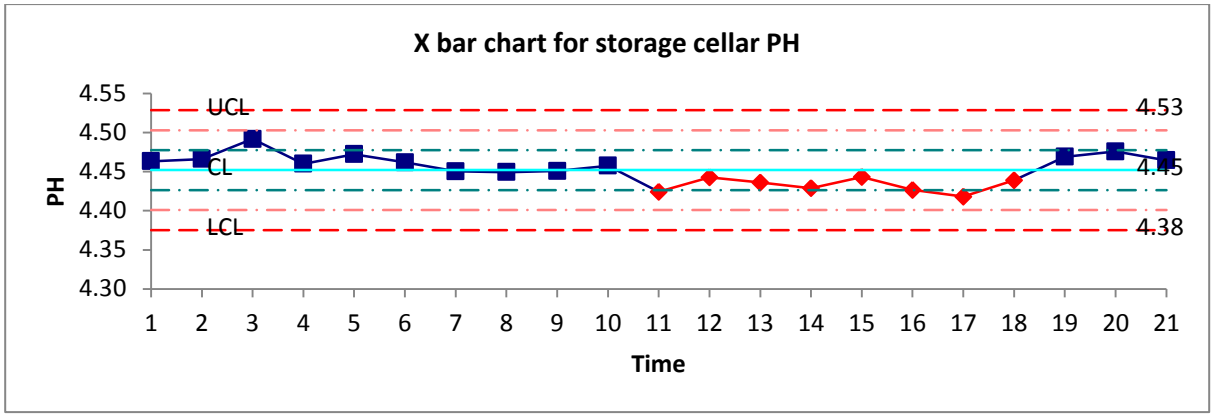

Figure 5.22: X bar chart for storage cellar PH for 2009/10

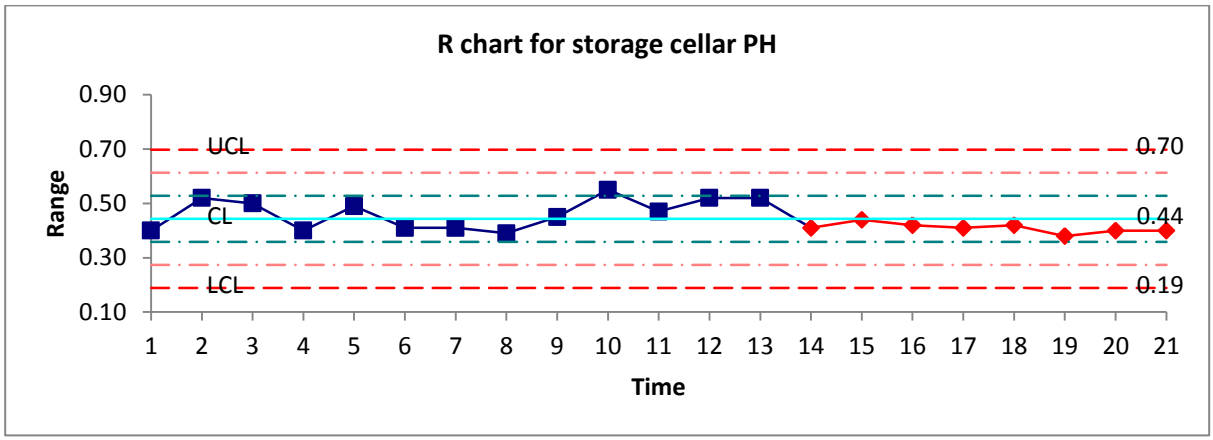

Figure 5.23: R chart for storage cellar PH for 2009/10

As it can be observed from the charts, almost all points fall inside 1sigma region and no points are outside the control limits. The factory specification limit is between **4.2- 4.6** while the specification limit in the control chart is **4.38-4.53**. Accordingly, there are no points outside both limits. Hence, the process of storage cellar is in control and stable. That means, the variation in the storage cellar is minimum and still the company should work to bring all points to the center line because the points which fail above and below have effects or incur cost to the product.

C. Bottling

In the bottling section also there are some parameters to be measured to detect the variation and to further reduce the causes of variation. The variation of this section has been identified by taking bottling PH parameter and the corresponding data recorded for the last year.

In this control chart, the points are outside the control limits. The bottling process is out of control as seen in the chart. But all points fall inside the factory standard which is from 4.2 -4.6. Therefore, the bottling process is stable according to factory standard but there is great variation in the process.

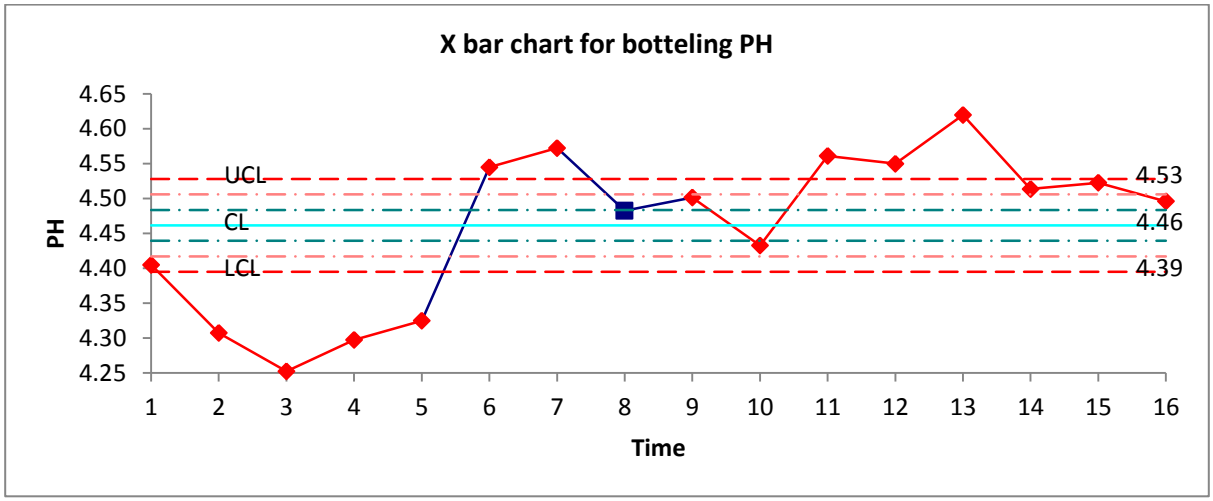

Figure 5.24: X bar chart for bottling PH for 2009/10

In the bottling section also the process meets the factory specification limit but the control chart drawn shows there is a great variation in the bottling process.

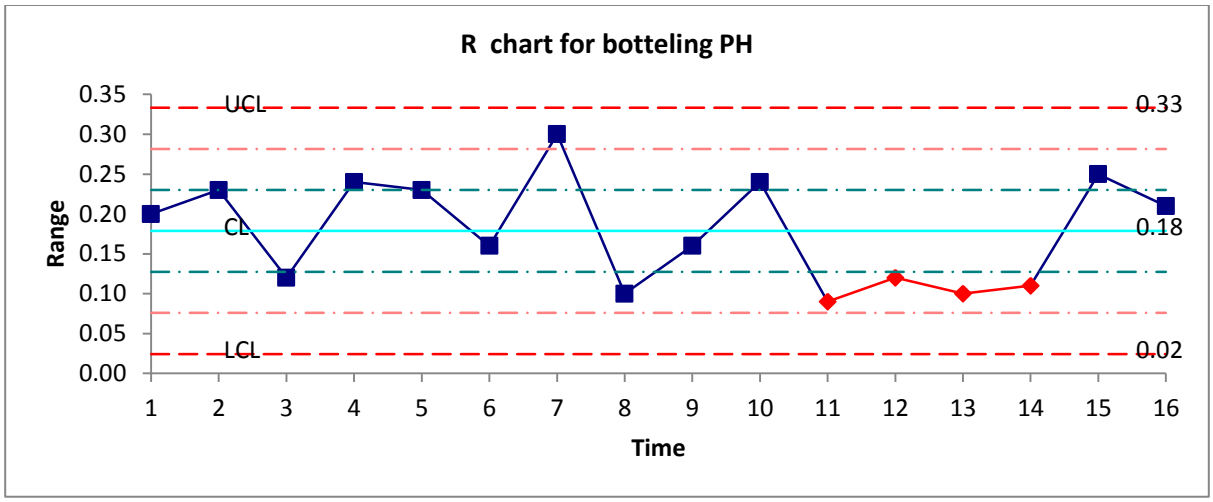

Figure 5.25: R chart for bottling PH for 2009/10

The current variation of the bottling process is also analyzed using the recent data for PH value and the corresponding control chart has been shown below. As seen in the control chart, no points are out of the control limits, and as a result the process can be said stable. All points fall within the 2sigma region and as a result the process satisfies both specification limits. Therefore it can be said that it is under control.

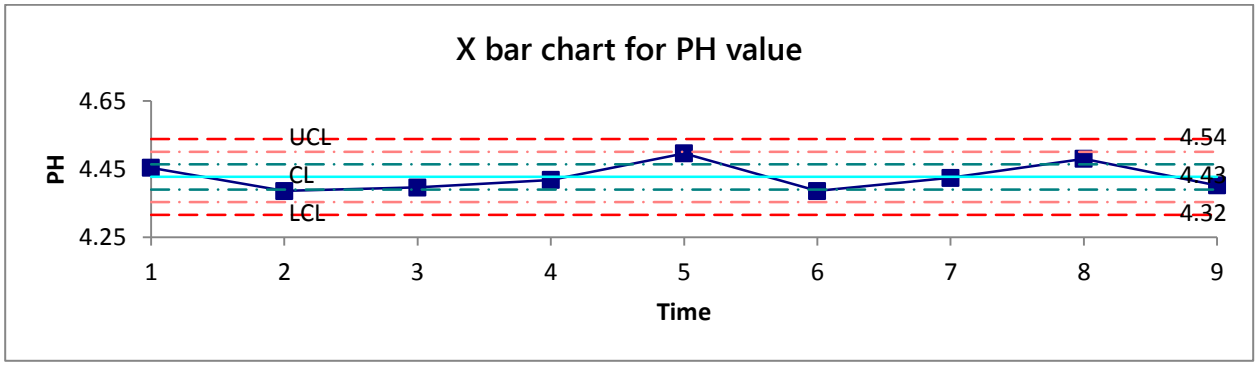

Figure 5.26: X bar chart for PH value for 2010/11

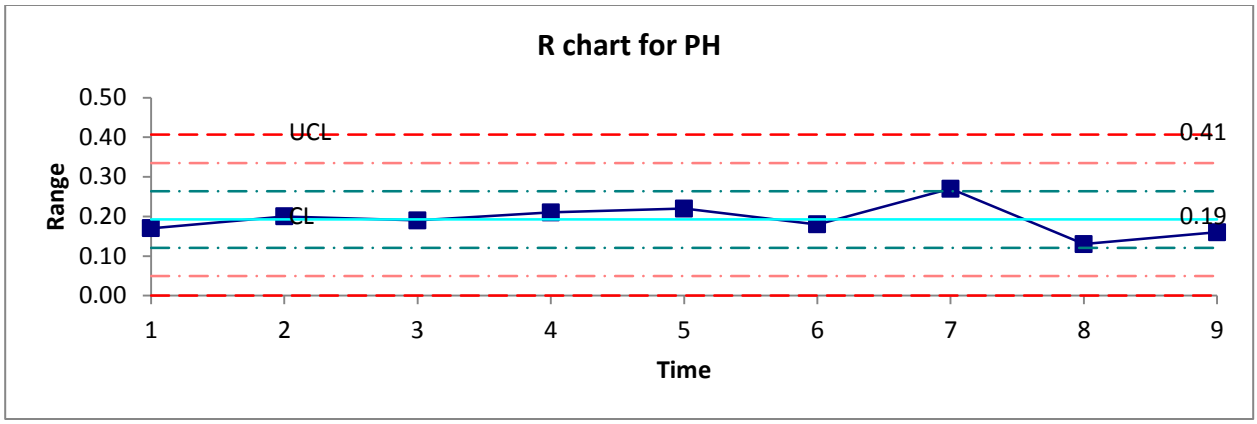

Figure 5.27: R chart for bottling PH for 2010/11

Generally, the production process shows some variation as shown in the charts but almost all the process is stable according to the factory specification limits. Here it can be observed that the variation is becoming stable this year than last year. That means the control charts drown for the data obtained from last year shows some variation while the control charts drown by taking the current data shows the processes are stable and under control. Despite the reduction in variation, further work should be investigated to understand and identify the major causes of variation and to take remedial actions so that the process becomes consistently stable.

The second measure for quality improvement is ***reduction in defective product***. To analyze this factor, a data about returned product after sell has been taken for the last five years. The parameters to say a product defective are under neck, quality problem, and empty, Brocken, CO2 and others.

Table 5.4: defective products for the past eight years

	2010/11	2009/10	2008/09	2007/08	2006/07	2005/06	2004/05	2003/04	Total
Under neck	11,637	39,911	13,679	18,015	10,282	14,079	2,929	10,304	120,836
Empty	-	-	-	-	1,115	2,120	1,188	4,903	4,423
Brocken	-	-	-	-	2,236	2278	960	-	5,474
CO_2	-		27	-	4,500	3,182	1,390	4,971	9,099
Quality	24	190	697	21,225	998	-	-	-	23,134
Total	11,661	40,101	14,403	39,240	19,131	21,659	6,467	20,178	
Production	67,166,595	82,673,086	72,207,407	90,853,579	79,401664	72,918,744	69,532,678	69,075,109	
% defective	0.0174	0.048	0.0199	0.0432	0.0241	0.0297	0.01	0.0292	

The trend of defective or returned products from year to year, it shows ups and downs as seen in figure 5.27 and 5.28. The company reduces significantly defective products in 2010/11 but there is no guaranty showing the consistency of reduction.

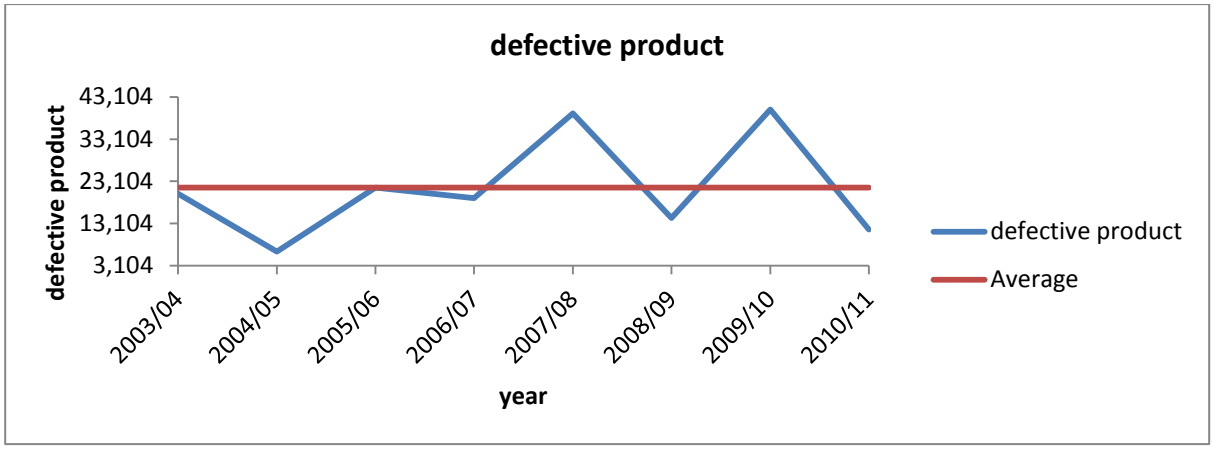

Figure 5.27: reduction in defective product in number

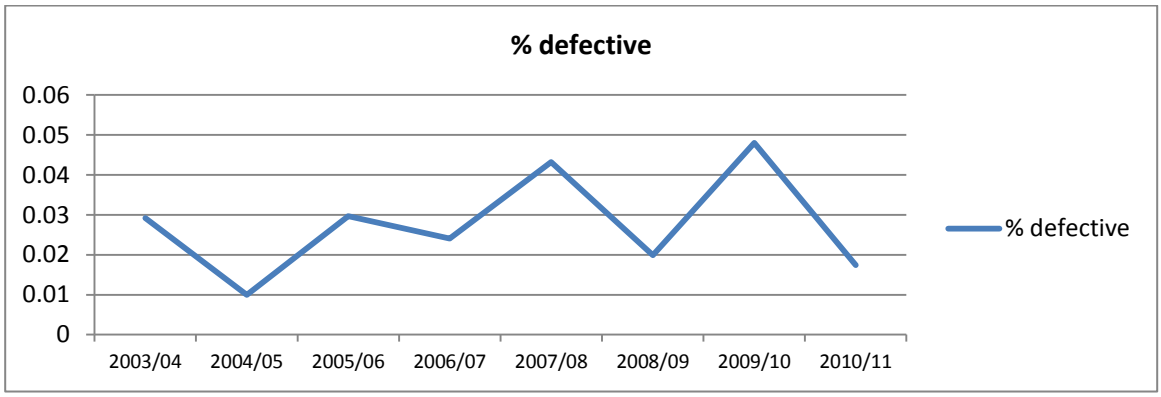

Figure 5.28: % defective product reduction

As seen from the trend of defective products, there is no consistency of reduction in defective products. Even though there are reductions below the average, the consistency of reduction should be kept by identifying problem areas and prioritizing the problems. The Pareto decagram below summarizes the major defects and priorities of the defects.

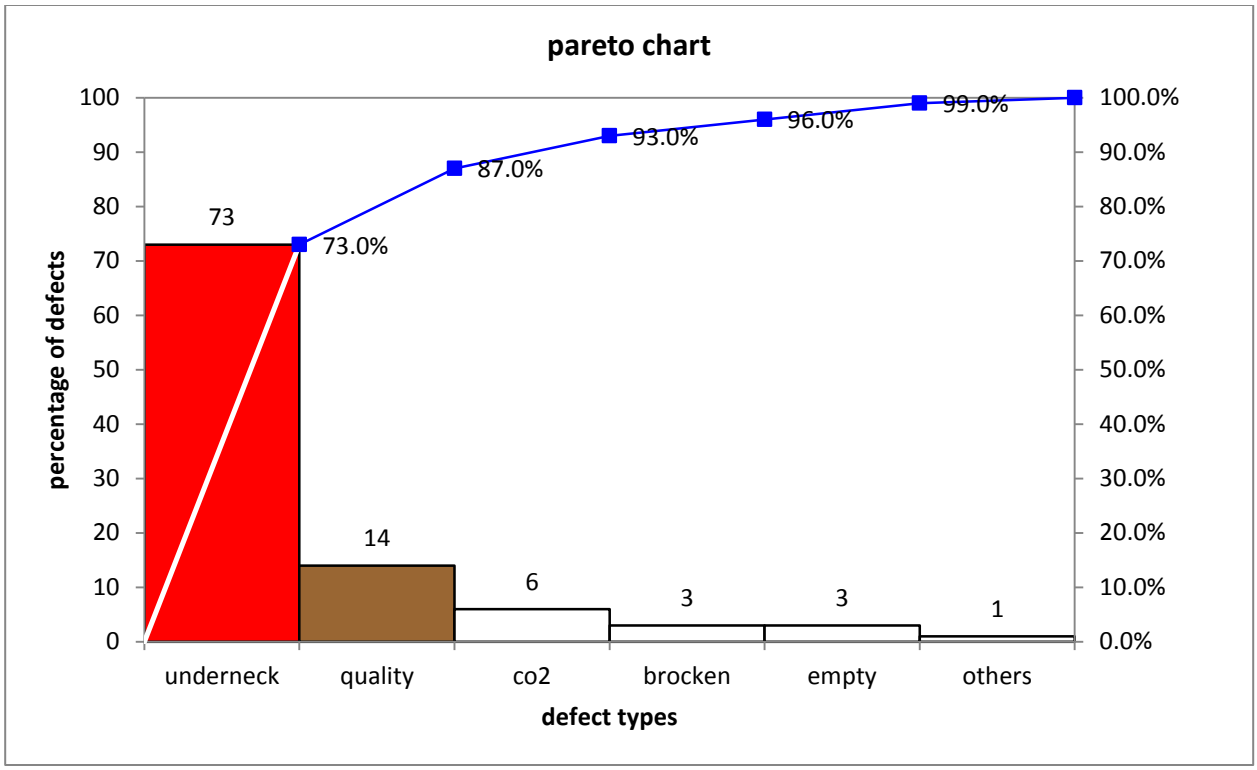

Figure 5.29: Pareto analysis for defects in the bottling section

As observed from figure 5.29, 73% of the defects come from under neck. By eliminating under neck, the company can reduce its 73% of defective products and can save a large (***480,444*** birr lost in the past five years due to under neck) amount of money which has been paid back for the customer who returns the product, for transportation and for the rework.

Generally, the major defect comes from the bottling section and by improving the bottling process it can be possible to minimize the defective products and can minimize customer complaints.

5.4.3. Productivity improvement

The productivity of the company is responsibly conducted with the system and productivity department. In the company, there are no recorded data about labor productivity, machine and material productivity. But, the system and productivity department is facilitating and supervising different activities which bring productivity. Among the major tasks; facilitating trainings for employees, effective water utilization, and effective power consumption, reduction on water treatment inputs, improving furnace productivity and illuminating waste are achieved well. The employee involvement and recognition is also one main factor in achieving productivity

improvement, figure 5.30 below shows the activities supervised and facilitated in system and productivity department.

Labor productivity: even though there are no recorded data about the productivity of the labor, there are some tasks performed to improve the capacity and skill of the worker so that to have productive labor. Among these, delivering training for members of the organization and trying to create better working conditions for employees are the main tasks performed in the organization. The training and education part is discussed in the former sections. With regard to creating better environment for workers, different safety and guaranty systems have been implemented. Chemical leakages like ammonia are eliminated and such like activities are being performed. In addition, different incentive mechanisms have been employed to make the employee productive.

Machine productivity: some major activities performed to improve machine productivity are improving furnace performance by reducing oil consumption per hectoliter of beer, minimized downtime of filling machine and improving CO_2 plant productivity. To do this the system and productivity department has organized teams and the team is effective in achieving a significant reductions. The other major factor is reducing the power consumption in the production process and as a result the machines become productive by giving better output with reduced power. The machine productivity improvement in year 2010/11 has been given in table 5.4.

Table 5.5: cost saved from machine productivity in 2010/11

Type of improvement	Acton taken	Saved cost in birr
Filling machine down time reduction	Effective maintenance	1,251,031.4
CO_2 plant productivity	Effective maintenance	59,346.9
Furnace plant efficiency	Replacement	880,708

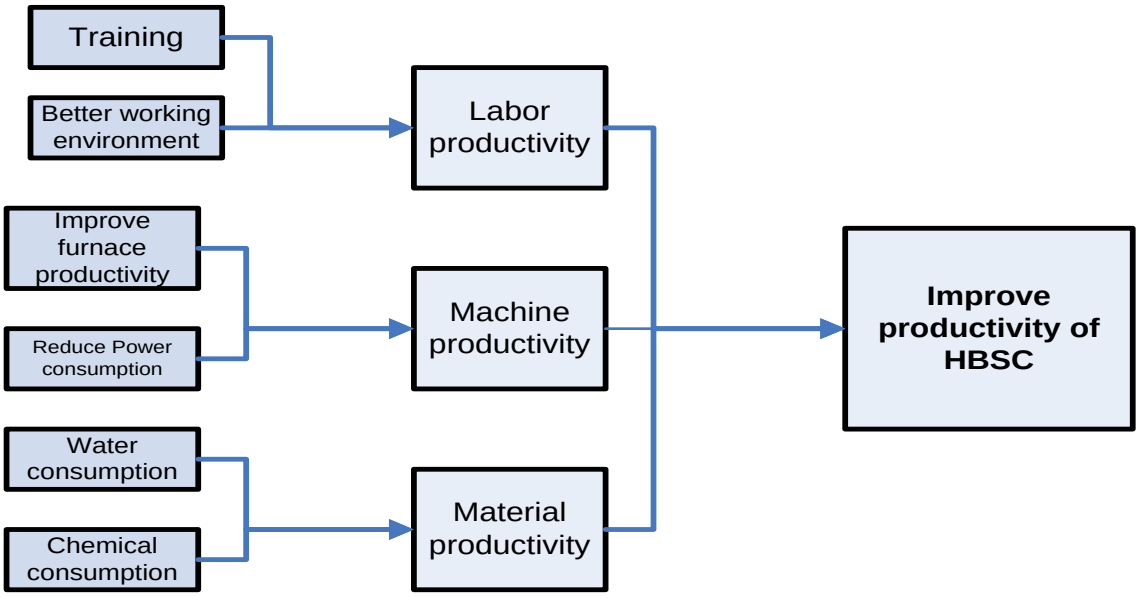

Figure 5.30: Activities performed to improve productivity

Material productivity: in bringing material productivity, the organized teams are working to efficiently utilize the main inputs of the production process. The major tasks performed to achieve material productivity are water consumption and chemical consumption. The teams are still working to reduce water consumption and achieve a reduction of water consumption11.5 hl/hl of beer to 7.97hl/hl of beer in successive six years. Regarding chemicals they achieve a reduction from 0.79kg/hl in 2003/04 to 0.37kg/hl in 2009/10. In addition, in year 2010/11, the raw material has been reduced with no any effect on quality of the product and as a result ***3,102, 421 birr*** has been saved.

5.4.4. Customer satisfaction

Customer satisfaction is one of the ultimate objectives of implementing quality improvement systems. The main customer satisfaction measures employed are: customer complaint, incentives given for employees, returns after sale, market share improvement and sales volume.

Customer's complaints have reduced nearly by 20 % within the last five years calculated from historical & current complaint types and data, i.e. Complaints related to product shortage are reduced by 15 % due to expansion and increased production by 50%, and improved customer related systems. Complaint related to customers' property handling and maintenance of customers

draft Kegs and machines are reduced by 5%, whereas complaint in relation to product quality is almost nil.

Incentives given for employees are one of the best practices of HBSC and accordingly about 2.2 million birr is given for employees as an incentive. In short, the internal customer satisfaction is increasing yearly and the involvement of employee is based on the motives of employee.

Return after sale shows slightly the trend of customer satisfaction. As the return after sale shows some yearly variations, customer's perception about the product may be negative and can create lost customers. The company should minimize returns after sale continuously. Return after sale is reduced to ***11,666*** bottles in 2003 from which it was ***40,101*** bottles in 2002. Reduction in return after sale indicates the customer satisfaction is increasing.

Sales volume is increasing for the past five years and this can show how the customers are consuming the product and customers are satisfied by drinking Harar beer. But it does not mean that sales volume increases necessarily customer satisfaction because there may be other several factors to make sales volume increased.

5.5. **Challenges and drawbacks of implementation**

HBSC has implemented the various quality management systems interactively to being better organizational performance. By implementing those systems it can achieve significant outcomes as analyzed in detail above. It is wrong to say that HBSC is best in implementing those techniques because there are several problems in implementing those practices. It is true that the company is better implementing, ISO, EMS and HACCP as compared to the general manufacturing industries in Ethiopia. In this section, some problems in implementing the above mentioned quality management practices have been identified and remedial actions to correct has also proposed.

Poor in applying tools and techniques: the implementation of improvement systems in HBSC is poor in applying tools and techniques especially quantitative techniques. They implemented ISO 9000: 2000, HACCP and ISO 14001 but the tools applied in analyzing and understanding the root causes for poor quality process is very low or almost none. Techniques and tools like SPC, acceptance sampling, reliability, and design of experiment, FMEA, QFD, QPD and other tools are

missed in implementing those practices in the company. In addition to these quantitative tools, none quantitative tools like benchmarking, total productive maintenance, concurrent engineering and others are not implemented well.

Lack support from other organizations: in implementing quality improvement systems the company should be supported with several organizations and it should be worked integrated with national organization working with quality like ESA and institutions and universities and consultants. HBSC uses some external experts to give training but the integration while implementing those systems with academia, national standard and regulation bodies and government is weak. Additionally, the implementation should be supported with benchmarking best practicing quality improvement. If worked together with those organizations, the implementation should be effective.

Problems on systems and principles: in implementing quality management, the company implemented some main elements or principles. The company implemented but it needs further improvement in some principles and systems. Some of them are illustrated as follow.

Leadership and management commitment: Leaders of HBSC should be committed in allocating resources for each improvement effort. They are allocating but it should be worked more and additionally the leaders should offer and facilitate in house training extensively which can minimize cost of training.

Resource utilization: the company is working well in utilizing resource but there are systems to be improved further. Production down time should be improved by implementing techniques like total productive maintenance. HBSC gives emphasis on minimizing or reduction of inputs like water and chemicals but utilization project should incorporate other inputs and should work on optimizing total system.

Continuous improvement: even though the company is working towards continuous improvement, the techniques and tools applied to bring continual improvement are not sufficient. They are poor in applying statistical tools like seven quality control tools, quality management tools and the likes. Above all, there is a little effort to improve the service delivering process of the company. The only implemented technique in this regard is an integrated performance management system which is developed by the company.

Training and education: HBSC delivers training for different focus groups as described earlier. But, almost 100% of the trainings are delivered by outsiders like the Ethiopian management institute, Zede Engineering PLC, QSAE and others. When the company plans to deliver training by external experts, it invests a huge cost which can be minimized by building internal experts. Therefore in house training should be given better emphasis.

Apart from the above listed drawbacks, the challenges in which HBSC faced during implementing quality management systems include: resistance to change, difficulty to understand the QMS, lack internal training and the likes. Most of the challenges have been curved by delivering extensive training and education while lacking internal training is still a challenge in the company.

5.6. Lessons to be learnt by other Manufacturers

Even though there are some problems in implementing quality management systems, HBSC has benefited from implementing those quality management systems. From the experience of this company, other manufacturing industries can learn some points as a lesson. The major points in which other manufacturers can learn from the experience of HBSC are discussed as follow.

Management belief

The management of HBSC has a strong belief on the benefits of implementing quality management systems. Without the belief of top management, nothing can be gone right because the belief of management on quality is the foundation for all efforts. Therefore, top managers of Ethiopian manufacturing industries can strongly learn how to make a belief on implementing quality improvement systems and other systems on the experience of HBSC. The management of the company doesn't bring this belief simply but through extensive training and experience sharing with some best in class manufactures in different countries. If the management has a strong belief on those quality and productivity improvement systems, the company is trying to move forward for achieving better performance. Figure 5.31 shows the impact of management belief on implementing quality improvement systems.

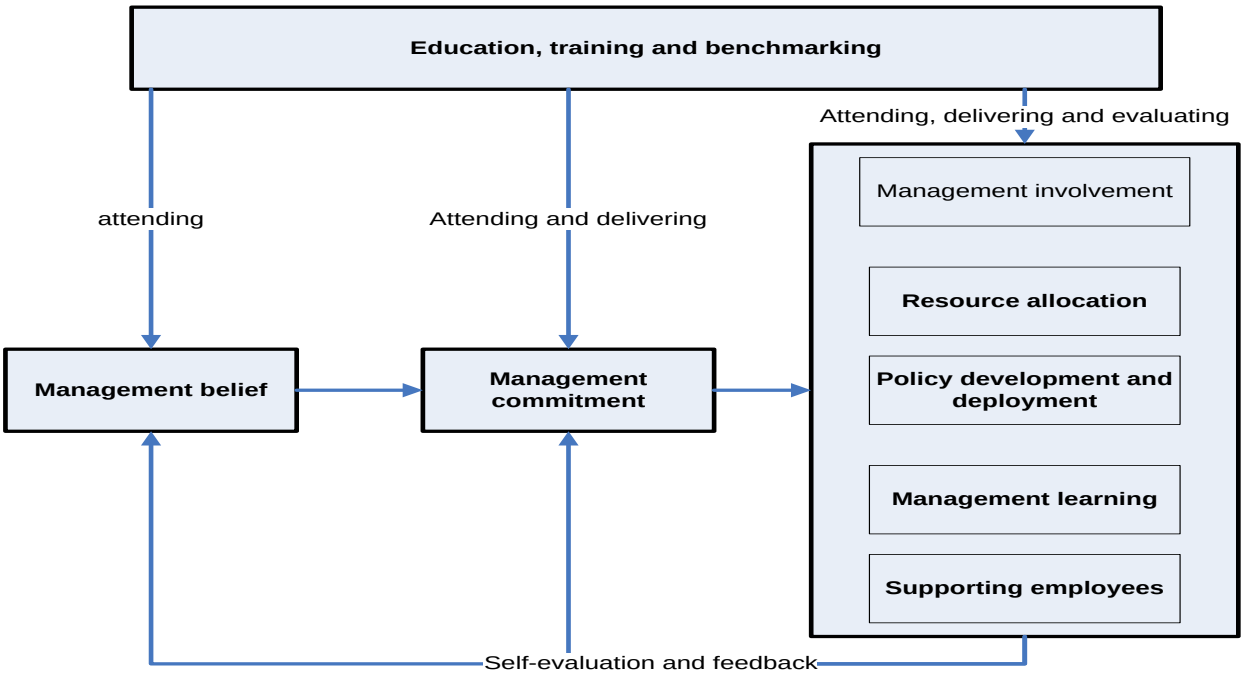

Figure 5.31*: The relationship between management belief and management commitment*

Internal customer focus

One of the greatest achievements of HBSC which can be a lesson for other manufacturing industries is the focus given and the effort employed to satisfy the internal customers. The management understood the impact of internal customer satisfaction on quality and productivity improvement. Ended HBSC can bring a change in the attitude of employees. To achieve this, the company performed several activities and incentive mechanisms. Some of the activities are:

- Commission fee throughout the month for salesmen
- 95% employees get incentives
- Additional incentives based on performance evaluation which amount to 10- 20% of employees' salary
- Visit arrangement to different companies
- All employees have insurance coverage for 24 hrs at work place or outside of the company.

- facilitated a means to minimize housing problems through credit association, providing long term & short term loan, supporting employees effort to get urban land ,as a result a number of employees has resolved their housing problem

- support employees children whose parents left the organization due to retirement, death or where children face serious problem beyond the capacity of their parents

These are some of the efforts practiced in HBSC to satisfy and motivate its internal customers. Therefore, other manufacturing industries must to learn such practices from the experience of HBSC. The company achieved in creating enlightens and satisfied customers. In other words, manufacturers should identify internal customers and then fined means to enlighten/satisfy their customers then, they can have delighted customers.

Figure 5.32*: Impact of customer focus on performance*

The effort towards training and capacity building

Education and training are the never ending activities in assuring continuous improvement. Understanding this, HBSC invested several efforts and costs to make the employees and the management capable for their respective tasks and responsibilities. Among the efforts employed in the past few years;

- Design and deliver different trainings periodically for the respective focus groups. Among the main trainings delivered: Environmental manage system Internal audit , Integrated performance management system, Management system refreshment, Practice of modern Internal auditing, QMS and HACCP internal audit, Risk management and Strategic planning and management are delivered training types for top level managers. In summery more than 451 employees have taken training in year 2009.

- The company invests about 600,000 birr on average for training and education activities.

- Facilitates and offers visits from both national and international tours. For instance six top level managers and three middle level managers visited foreign manufacturers in Germany ,KRONES, HUPMANN SOUTH AFRICA , USA, ITALY , PADOVAN, Kenya, Sudan ,.Djibouti ,FRANCE and Tanzania to share experience. And ten experts visited Italy, Germany and Tanzania.

- More than 10 local manufacturing industries are also visited by employees to have an experience sharing

Generally, HBSC invest a huge capital on training and education but now the money is paid back through improved performance of the overall systems and process. Therefore manufacturers can learn from the company that by investing huge cost for capacity building, it can be possible to bring improvements in quality, productivity, customer satisfaction and financial strength because it is proofed by HBSC.

Clear procedures and documentation

Having clear procedures and documentation, can bring better outcomes in process and service improvement. HBSC has been benefited by developing clear procedures for each and every processes and decision making. Starting from documented guidelines, the company developed and implemented and kept all procedures like work instructions, complaint handling systems, process variation or quality reports and others have been kept safely and evaluated periodically for further improvement. Most importantly, the company is developing a general database for keeping records for a long time safely and to share for responsible bodies easily. Designing clear procedures and recording all outcomes from the process is one of the common mistakes of manufacturers of Ethiopia. These can take the experience of HBSC in developing, keeping, and implementing those documentations.

Interaction with the society

Better interaction with the society has a great impact on the performance of the company. When one organization has been established, one of its objectives is serving the society by participating in community serving programs. HBSC is performing some activities to have good images in the society and by doing this to capture 100% of market share around Harar. As a result HBSC

participated in several community support services around Harar and Dire Dawa. To mention some:

- Constructed Standard Health center at Haramaya Woreda
- Water supply Haramaya Woreda
- Asphalt Road construction at Harar Town
- Fountain at Dire Dawa Town
- Establishment of soccer team
- Supporting sport teams , football, Tennis table, Cycle at various town
- Afforestation of Hakim Gara and plantation of road side trees
- Beautification of public parks at Harar Town and Dire Dawa
- Sponsoring various civic associations
- Support environmental protection activities in different regions

By participating in such community development activities, HBSC achieve market share of 80.14% in Harar and around Harar. Apart from this, the company has better image in the society.

From this experience of HBSC, other manufacturers can learn that serving the community is one way or method of competition. If the company participates in community or social development programs, the society reward the company with better image and ultimately, that company can have better market share and acceptance than its competitors in the society. Apart from having better market share, participating in community development and environmental programs means keeping the country and the society from hazards and disasters. Since without the society there is no market, and ultimately the survival of the company is dependent on the society, other manufacturing industries in Ethiopia should keep their society by learning from the experience of HBSC.

Managing quality at the source

As it has been stated in literature managing the quality at the source is a key success factor for manufacturing firms. HBSC also identified major problems on quality of raw material and then working together with the supplier to know the root causes and improve the quality of raw material. One of the good experiences of HBSC is the measure taken to improve the quality of malt which is taken from Asela Malt Factory. From one ordered quantity of Assela malt about 3% is rejected which can cost high capital. To solve the problem, by initiating other beer manufacturers, HBSC is working joint researches on barley to improve the quality. The project requires about 12 million birr and 60% covered by Asela Malt Factory and 40% is covered by beer manufacturers. In addition, the company identified one of the reasons for being weak in export market is poor packaging system. As a result, the company tried to work with Burayu, Yekatit Pulp, and Techno Print to improve the packaging quality and planed further to improve the packaging quality and then to increase the share of export market. Therefore it is a good lesson for other manufacturing industries of Ethiopia. By working cooperatively with the supplier, poor raw material and the cost associated with poor quality product can be reduced significantly.

Project based management system

HBSC has not grasped on total employee involvement in bringing total quality and better system performance even if they are trying. The method they are implementing is project based management system which is the unique method of the company. The system and corporate planning department of the company is responsible to conduct and coordinate projects and project teams and is directly accountable to the general manager. The cross functional teams from different departments organized in teams have been given an assignment on identified major problems to be improved. Even for those improved methods and process, the management gives projects to find opportunities for further improvement. Then the management audit and review the performance of the teams and projects undertaken with the supervision of the corporate and planning department. Based on the effectiveness of the projects, the continuity and planning of other projects for further improving the system has been developed jointly with the teams, system department and general manager. Each and every problem in the company are currently tried to be improved through this project based management system. The amazing and most interesting

point here also is the members in the teams are working the projects as additional task to their normal job. There are some major achievements in implementing this project based management system. The major and efficient projects performed by the integration of the EMS and QMS teams include: reduction of water consumption per hectoliter, reduction of water treatment inputs, reduction of furnace oil and reduction of power consumption in the production process. They set targets every year and continuously improve the process to reduce the utilization of the above resource effectively. The most achieved performances of the projects are illustrated in the following charts.

The consumption of water is reduced from 11.5 hl/hl of beer to 7.97hl/hl of beer in successive six years improvement as seen below. As a result the company saved huge cost which was incurred in water treatment. By doing so, ***1,117,943.89*** birr can be saved annually as compared to the water consumed in 2003/04.

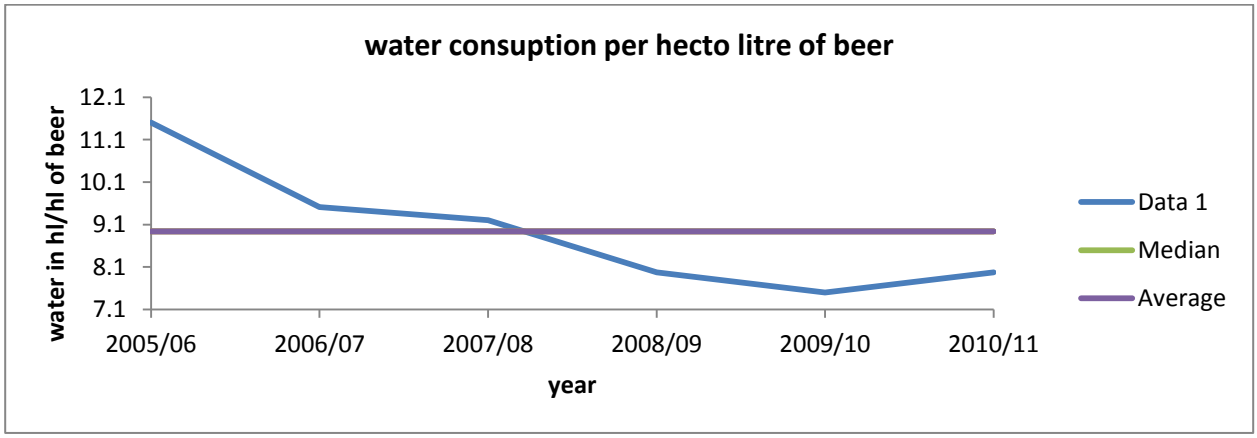

Figure 5.33*: water consumption per hectoliter of beer*

Another significant improvement comes from utilizing water treatment inputs effectively. As shown in the graph, the chemical consumption was 0.79kg/hl in 2004 and reduced to 0.37kg/hl in 2010. The company is still working for further improvements in utilization of resources. By reducing the water treatment input to 0.37kg/hl of beer, about ***416,995.85*** birr has been saved annually.

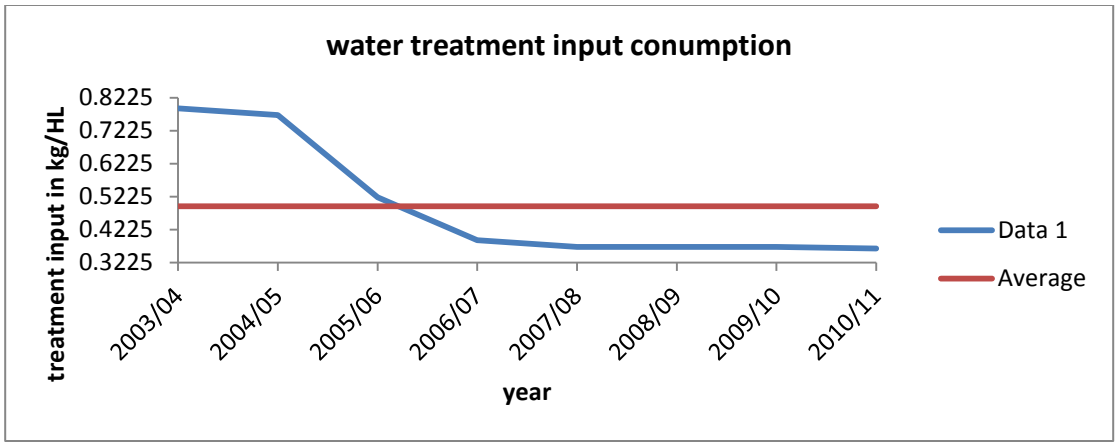

Figure 5.34*: water treatment input consumption*

The other most important improvement again is the improvement on furnace oil consumption. As seen in figure 5.35, the consumption of furnace oil is reduced to 5.8lit/hl from which it was 7.99 lit/hl in 2004. Still the improvement teams are working to improve the utilization of furnace oil effectively. By improving the furnace efficiency ***3,286,288.605*** birr has been saved as compared to the consumption of furnace oil in 2004.

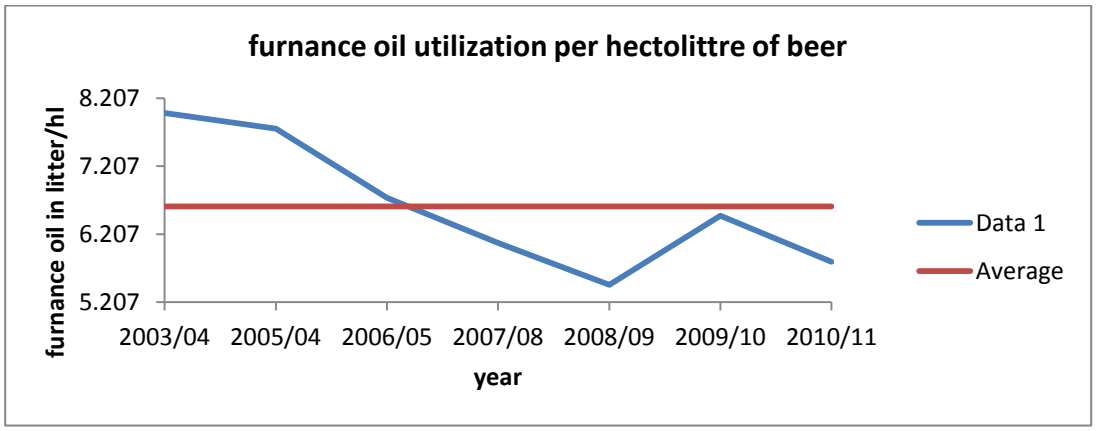

Figure 5.35: furnace oil consumption

Generally, this project based management system brought a significant improvement in HBSC. A huge amount of money (5,994,465 birr) is saved due to utilizing the resources efficiently. Therefore other manufacturing industries can take the experience of HBSC regarding project based management system and implement it and gain the benefits of utilizing the resources effectively. As it has been seen in HBSC, implementing project based management system

doesn't require a huge capital but initiation of employees and management. The table 5.5 summarizes the major achievements by implementing these project based management system on utilizing resources effectively. Note that the reductions are changed to money by assuming the unit cost for inputs is similar for the past three years.

Table 5.6: the achievements after implementing quality management practices

Benefits/Achieved	Amount			
	Before QMS, HACCP and EMS implementation (before 2005)	After QMS, HACCP and EMS implementation (after 2005)	Reduction	Financial Benefit
Cost Saving due to reduced product wastage	**5.45 %**	**5.2 %**	**0.25 %**	**100685.60**
Cost saving due to reduced bottle breakage	**0.76%**	**0.42%**	**0.34%**	**712927.06**
Cost saving due to optimum utilization of water	**11.15 hl/hl of beer**	**7.97hl/hl of beer**	**3.18hl/hl of beer**	**1117943.89**
Cost saving due to reduced water treatment chemical consumption	**0.79 Kg/hl of beer**	**0.37 kg/hl of beer**	**0.42kg/hl of beer**	**416995.85**
Cost saving due to reduced furnace oil consumption	**8.07 lit/hl of beer**	**5.8lit/hl of beer**	**2.27lit/hl of beer**	**3286288.605**
Cost saving due to reduced electric power consumption	**20.13 KWH/hl of beer**	**18.02 KWH/hl of beer**	**2.11 KWH/hl of beer**	**359623.98**
			Total	**5,994,465 birr**

The major activities done in achieving such savings from efficient resource utilization are awareness training on utilization of resources, effectively maintaining the process, insulating some parts, replacing obsolete spare parts and equipment, critical studies on reduction of inputs and currently developing water and utility consumption standards.

5.7. Customizing HBSC's case to the General Manufacturing Industries

Harar Brewery Share Company has implemented the QMS, EMS and HACCP system in a better way although there are some factors needing further improvements. From the experience of HBSC, it can be concluded that the Ethiopian manufacturing industries can implement such quality management practices. This is because HBSC is a local manufacturer approximately with similar culture and similar working environment. With almost similar circumstances with other local manufacturers, the company implemented these quality management practices effectively. So, "why not other manufacturers?" is the basic question to be arose. The main difference here is the management belief on the efforts and devotions to be employed in implementing those systems so that the company becomes better performer. Believing on implementing quality management practices, the management made himself committed to pay the effort and devotion needed during the implementation process. This helped the implementation of such practices effectively.

As it been discussed in detail, the implementation of quality management in HBSC focused on implementing systems and principles of quality management. The application of tools and techniques of quality management has been missed in implementing quality management practices. If these tools and techniques have been applied integrated with systems and principles of quality management, better results can be achieved. Systems and techniques should be supported with tools and techniques of quality management.

In implementing quality management practices, manufacturers of Ethiopia should take and understand the lessons identified from the experience of HBSC. Because the lessons identified are the major engines of implementing quality management practices in the company. Therefore, in customizing the case of HBSC to other manufacturers:

1. The lessons of HBSC should be taken and understood critically so that it can be easy to practice
2. The systems and principles of quality management which have been given major emphasis in HBSC should be supported with tools and techniques of quality management and should be applied interactively.

3. Experience sharing and working with different governmental as well as nongovernmental organizations to implement quality management
4. Further improve the system and principles of quality management which have been taken as poorly implemented in HBSC

In general, in implementing quality management practice like ISO 9000, EMS, and HACCP, the integration of quality management systems and principles with quality management tools and techniques is an important task. Integrating them and working with different supportive organizations can lead effective implementation of those practices. The quality management implementation procedures are common for most practices. In implementing these systems, the involvement and commitment of all members of the organization is mandatory.

Chapter Six
Conclusion and Recommendation

6.1.Conclusion

Quality management is a hot issue as quality is becoming a single competitive dimension in today's market. To have a competitive power, organizations in different parts of the world have practiced several quality management practices. The most widely implemented quality practices that have got worldwide acceptance include ISO 9000 quality management system, ISO 14000 environmental management system, Hazard Analysis and Critical Control Point and total quality management. The implementation of these practices brings tangible benefits for those organizations which implemented effectively and others failed in implementing them. Currently the developing world is implementing these systems widely to bring better organizational performance but still there are several hindrances in achieving better organizational performance.

Poor quality management practices and lack of implementing these practices effectively has affected the manufacturing industries of Ethiopia. Their effort in adapting and customizing such quality improvement systems is very poor. Even some local companies who tried to implement ISO 9000 can't bring tangible outputs and this is due to poor leadership style, non-existence or weak link between industry, customer and supplier, unskilled employee as there are no organized trainings delivered, lack of sound policies and strategies and inability to integrate with quality policy. Despite these problems, there are very few local manufacturing industries that have implemented different quality management practices and achieved better organizational performance. Harar Brewery Share Company (HBSC) is among the better performing industries by implementing such practices.

HBSC implemented three quality management practices interactively; ISO 9000:2000 QMS, ISO 14001:2004 EMS and HACCP systems. In implementing these practices the company invests higher efforts and now the invested effort has been paid back from the benefits of effective implementation of these systems. The major achievements of the company by implementing the three quality management practices effectively are: 1) successive improvement in financial performance and achieving gross profit of *74,151,000 birr* in year 2003, 2) reducing

process variation so that products comply the factory standard and European brewery convention, 3) saving of *5,994,465 birr* annually by utilizing the resource efficiently, 4) achieving 100% capacity utilization, 5) lay foundation or moved some steps forward to bring total involvement on quality, 6) acquired skilled employees who are an input for future improvement, 7) grew its scope and coverage by interacting with several organizations and with the society, 8) increased production capacity and sales volume significantly, 9) new technology adaption and adoption to improve the process. This shows that HBSC is becoming a visionary local manufacturer and if sustained its improvements continually, the company can achieve better results on the coming years.

By implementing such quality management systems effectively, HBSC leave a message or lesson for other local manufacturers. The most sounding efforts of the company to be taken as a lesson for other manufacturers include: 1) the belief of management on the impacts of quality management practices, 2) how to manage quality of raw material by working cooperatively with suppliers, 3) how to optimize the process by applying project based management systems to use resources effectively, 4) the effort needed to make employees capable for their work and the focus given for internal customers to bring better organizational performance, 5) clear documentation and record keepings and communication systems. These are the backbones of the company in implementing the quality management practices listed above.

From the experience of HBSC, the manufacturing industries of Ethiopia can learn different lessons and can have the commencement to implement such improvement techniques. From this it can be concluded that if effectively implemented, ISO 9000 quality management systems and EMS can bring a significant change on organizational performance. To bring such achievements the manufacturing industries of the country should move faster and benchmark better performing local companies in addition to best in class organizations.

6.2.Recommendation

The manufacturing industries of Ethiopia should implement quality management practices in their processes to survive and penetrate the international market because quality is becoming the issue of survival in this globalized market. There are several practices to improve quality but it is better to start on most widely implemented and worldwide accepted efforts. Since being ISO 9000 certified is becoming as a criterion in choosing suppliers for products currently, it is better to implement such systems as it brings tangible outputs if effectively implemented as HBSC done it better. Even though HBSC has implemented better, it doesn't mean there are no drawbacks. There are some problems to be improved further and should be given focus.

In order to bring further improvement, Harar Brewery Share Company is recommended:

1. To utilize tools and techniques of quality management extensively so that to make management process simple. Currently the company is focused on implementing systems and principles of quality management but this should be supported with quality management tools.
2. Internal training should be given better emphasis. Almost 100% trainings have been given by external experts and consultants till now. This costs a huge capital and if internal training has been practiced, this cost can be saved
3. The company should work cooperatively with governmental supportive organizations and universities to bring better improvements at a national level
4. The management should secure the consistency of the improvement on progress and move forward to achieve total participation on total quality.

If make this listed improvements on the current performance, HBSC can achieve even further improvements.

In implementing such quality management improvement techniques, the manufacturing industries of Ethiopia are recommended to do the following tasks.

1. The management of the companies should have a belief on the benefits of implementing such quality improvement practices
2. The manufacturing industries of Ethiopia should take the experience of HBSC's best practice which is project based management system which is important tool in utilizing resources efficiently.
3. The management of the industries should give greater focus for capacity building and skill improvement in members of the industry
4. The manufacturers should work interactively with suppliers to control quality of raw material at the source
5. Record keeping and clear procedures for all tasks should be developed which are an inputs for further improvement.

To make the implementation of quality management practices at the national level, the following recommended tasks should be performed.

1. Leadership institutes should be established in the country to change the style of current leadership style.
2. Government should support the industry by structuring supportive institutions like the productivity and quality center
3. The involvement of every stakeholder in the country should take its part in implementing quality management systems, so that the manufacturing sector would play better share in the development of the country.

Generally, the manufacturing industries of the country should implement quality improvement systems like ISO 9000 quality management systems to achieve better performance. The most essential and influential factor in implementation is the belief of management on benefits of implementing such quality management practices and securing its commitment to the implementation.

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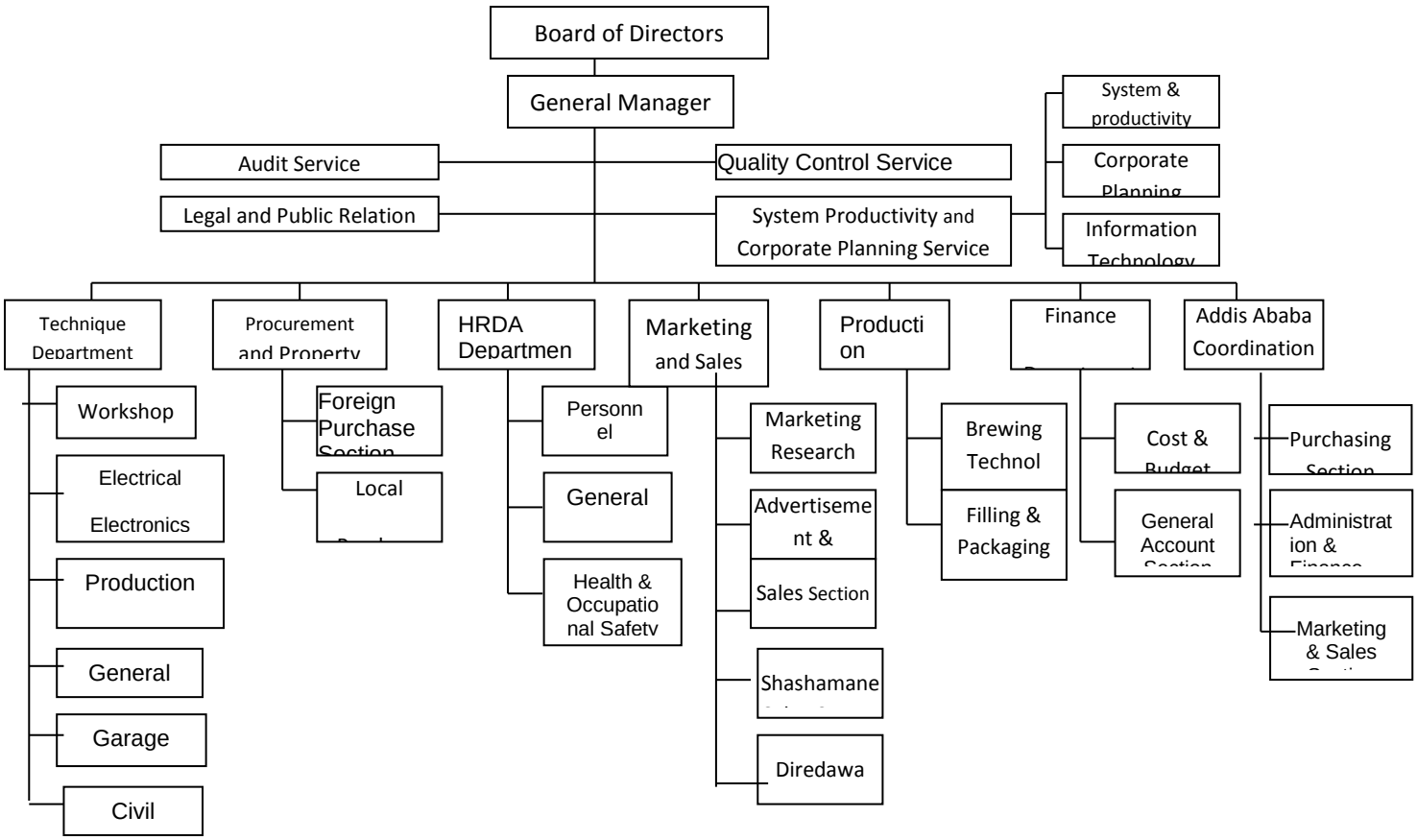
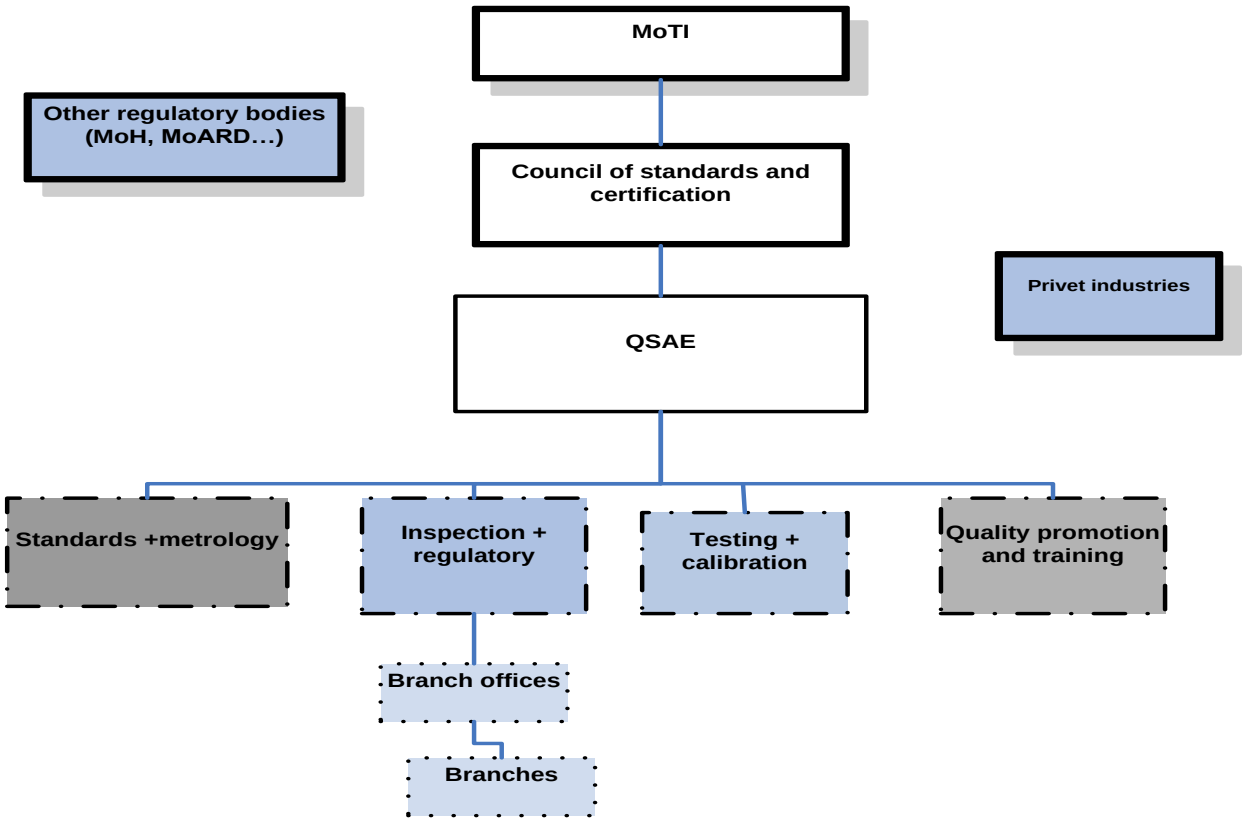
Annexes

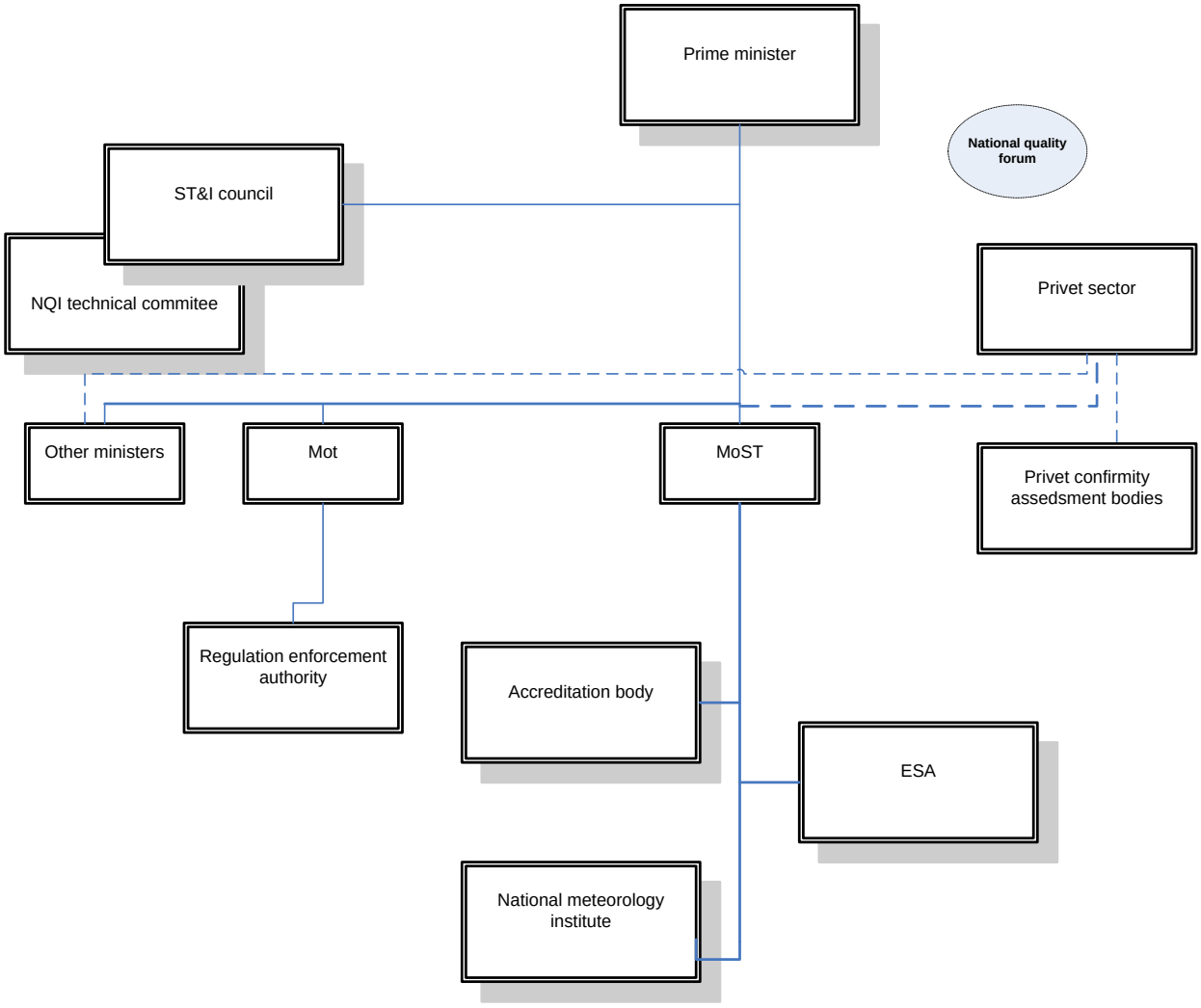
Annex 1: organizational structure of Harar Brewery Share Company



Annex 2: organizational structure of old NQI



Annex 2: organizational structure of new NQI



Annex 4: data obtained from factory yearly report (little part of the data)

	2010/11	2009/10	2008/09	2007/08	2006/07
No of trainings	25	30	21	56	32
No of trainees	412*	596	1102	972	761
Costs of education+ training	478,721	646,760	656,340	697,340	297470

Trainings and associated costs

	2010/11	2009/10	2008/09	2007/08	2006/07
Advertisement & promotion cost	8,218,962	12,678,927	8,528,231	3,729,286	3,973,713

Advertisement and promotion costs

	2010/11	2009/10	2008/09	2007/08	2006/07	2005/06
Demand(hl)	220,478*	297,000	297,000	297,000	270,600	224,400

Reduction in Resource utilization

		2010/11	2009/10	2008/09	2007/08	2006/07	2005/06	2004/05	2003/04
Bottle breakage	num	277,343	360,420	321,392	416,481	403,673	385,748	492,958	440,550
	%	0.42	0.56	0.58	0.57	0.59	0.58	0.76	0.63
Beer leakage	hl	14,795	20,155	17,660	19,348	16,070	13,205	13,236	13,958
	%	0.98	0.689	6.90	6.06	5.6	5.2	5.45	5.77
Capacity (%)		100	92	85	101				
Water (hl/hl)		-		7.5	7.97	9.2	9.51	11.5	
Water treatment input(kg/hl)		0.365	0.37	0.37	0.37	0.39	0.52	0.77	0.79
Furnace oil(lit/hl)			5.81	6.48	5.46	6.08	6.74	7.76	7.99
Power consumption (kw/hl)		17.05	16.31	18.33	16.1	18.15	-	-	-

Annex 5: interviewed companies and corresponding persons contacted

s.n	Name of company	Position of person contacted
1	Kangaroo shoe factory	Production and planning section head
2	Universal food complex	Vice manager
3	Harar brewery share company(Addis Ababa coordination office)	Manager for A.A supervision office
4	Faffa food share company	Production and technique manager
5	Metal fabrication industry	Inspection and quality head
6	Hibret manufacturing and machine building industry	Process and plant control head
7	Dan lift technology	Material manager

8	Akaki garment share company	Production and technique department
9	Anbessa shoe share company	Quality assurance and design department head
10	Gafat Armament industry	Design engineer in R&D
11	Ayika Addis textile investment group	Production planner
13	Leather Industry Development Institute	Experts in goods and garment, leather technology
15	QSAE	Quality promotion and training directorate staff
16	ecbp head office	NQI office staff

Annex 7: Interview Questions

Interview questions

The main objective of an interview is to grasp the real quality related problems of the manufacturing industries. The interview questions are developed based on different self - assessment criteria of different models and the works of different scholars. The question contained a questions used to understand the general awareness about quality in the first part and questions to grasp quality problems related to principles and practices of total quality.

1. **General awareness**

   1.1. What do you mean by quality?

   1.2. What do you know about Total quality management?

   1.3. Whom do you think as a responsible to product quality?

   1.4. What types of quality control tools are used to control product quality?

   1.5. What do you think is the problem in the management which affects the quality of product?

2. Principles and practices

2.1. What is the quality policy of the company? How it has been developed?

2.2. Is the management actively participate in producing quality product, to what extent is the management leadership favor quality?

2.3. How can you express your readiness to change? To adapt a new system?

2.4. How you select your suppliers and how you are keeping better relation with them?

2.5. Who your company has utilized the available resources? And what tools and techniques have been applied?

2.6. What are your customers? What are the mechanisms you communicate with your customers?

2.7. Have you integrated the quality policy as a business strategy, what do you think in the future?

2.8. How do you explain the empowerment and involvement of employees on improving quality?

2.9. Have you taken any quality training? Delivered any training? Have your employees taken continuous training?

2.10. What problems you observe on workers which can affect the quality and productivity of the company? Would you participate in any of decision making in the company? What is the level of employees in decision making?