# QUALITY MANAGEMENT: EFFORTS AND PROBLEMS IN ETHIOPIAN MANUFACTURING INDUSTRIES

**Daniel Kitaw and Fasika Bete**
**Department of Mechanical Engineering**
**Addis Ababa University**

## ABSTRACT

*This paper deals with the analysis and the current quality management practices in Ethiopian manufacturing industries. The research is based on a survey conducted on 55 representative industries all over the country. A brief introduction is given on the fundamental concepts of quality with reference to the recent literature in the area so as to help readers follow the model developed. The quality problems of the industries and the root causes that trigger them have been analyzed by employing a well structured questionnaire. Then a quality management implementation model is developed along with the step–by–step approach to attain the goal. Finally a number of recommendations are given at individual level, institutional level and at a national level. This paper may also be considered as a summary of the existing situation and a lead for future researches in the field.*

## INTRODUCTION

The globalization of the market and the rapid improvements in information flow capabilities, have made competition to be fierce worldwide. The economic globalization has an impact both on developed and developing countries. For developed and some of developing countries, globalization provides new opportunities for expansion and growth through increased international marketing possibilities. For the majority of developing countries, however, globalization brings risks due to the fact that they are unlikely to survive in their present form without improving quality, competitiveness and management practices. In an effort to become efficient, flexible and more competitiveness in today's changing business environment, many countries and companies across the world have started to realize the benefits of quality management and in particular Total Quality Management (TQM) and ISO 9000.

## WHAT IS QUALITY?

The term quality has acquired many meanings, depending on the people concerned, and the criteria felt to be important. Quality has been misunderstood to refer, variously, to luxury goods for the super-rich, to excellence in the name and achievement, to products of distinctive design and style, to special services, to the intricate workmanship of the master craftsman. However, there are other definitions widely discussed, and various schools of quality have grown up around particular versions. Some typical definitions of quality are:

- Quality is the extent to which the customer or users believe the product or service surpasses their needs and expectations – Gitlow *et al.* [1].
- Quality is the totality of features and characteristics of a product that bear on its ability to satisfy stated or implied needs –ISO [2].
- Good quality means a predictable degree of uniformity and dependability at a low cost with a quality suited to the market – Deming [3].
- Quality is the total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product in use will meet the expectations of the customer – Feigenbaum [4].
- Quality is the loss a product causes to society after being shipped – Taguchi [5].

- Quality as "conformance to requirement" – Crosby [6].

Ultimately quality management seeks to create prosperity through human endeavor. It is a form of business management committed to customer satisfaction through continuous improvement. Since business culture varies from country to country and from company to company, there is no set standard form of a good quality management program. Each single program must be planned and implemented on the basis of the nature of its activities and environment.

**Quality and Competitiveness**

Higher product quality is required for a company to become more competitive, both locally and in international trade. Improved quality at the enterprise level lowers its cost of operations and increases its productivity. The firm's ability to produce better products at a reduced (or even the same) price boosts its market share (Fig.1 Quality and Competitiveness). The benefits that accrue from improved quality at individual firm level also augment national competitiveness. Hence, many world-class firms and nations use quality as a powerful competitive tool.

**Total Quality Management (TQM)**

Different people consider TQM as a program, a process, the Deming's approach, employee empowerment and teamwork techniques, etc. However, TQM is a management philosophy for achieving highest standards in customer satisfaction and quality of work at lowest cost through employee participation that emphasizes to meet external and internal customers' needs and expectations and the importance of doing things right first time. Oakland [22] defined it as: "An approach to improving the competitiveness, effectiveness, and flexibility of a whole organization. It is essentially a way of planning, organizing and understanding each activity, and depends on each individual at each level."

Many companies world-wide, but in particular those in Japan, the USA and Western Europe have implemented TQM as a way of maximizing customer satisfaction, gaining better product quality, and obtaining higher productivity through the systematic removal of waste and the reduction of nonproductive activities. Many companies in developing countries want to follow suit, but they do not know how to implement TQM, or which factors/activities are important and in most cases regard it only as quality circle activities [7].

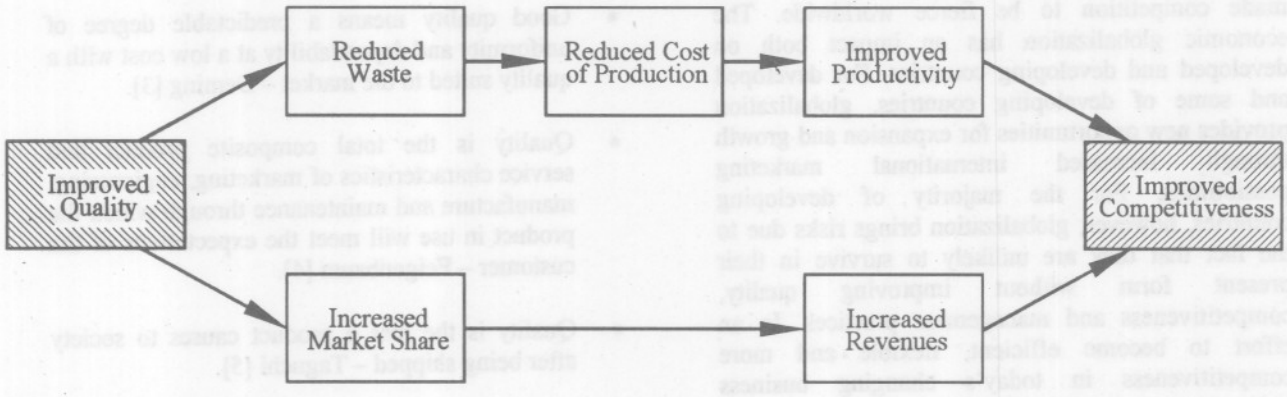


Figure 1 Quality and Competitiveness Source: Adapted from Garvin [23]

To apply the philosophy of TQM, a company must operate by several principles. First, all functions inside an organization, including production, finance, marketing, information systems and purchasing, should apply quality control to improve their output. Second, each part of the company has to focus on meeting customer requirements and expectations the first time and every time. Third, each part of the company must strive to improve continuously. Fourth, to achieve these aims, the entire workforce must be involved, and employees must be empowered.

During the last twenty years, the three most frequently used self-assessment models have been Japan's Deming Application Prize, the Malcolm Baldrige National Quality Award, and the European Quality Award. Each award is based on a perceived model of total quality management. They do not focus solely on either product or service perfection or traditional quality management methods, but consider a wide range of management activities, behavior and processes which influence the quality of the final offerings. The model of the European Quality Award is divided into two parts: *enablers* and *results*. The enablers are leadership, people management, policy & strategy, resources, and processes. These five aspects steer the business and facilitate the transformation of inputs to outputs. The results are people satisfaction, customer satisfaction, impact on society, and business results which are the measure of the level of output attained by the organization. The model consists of nine primary elements which are further divided into a number of secondary elements (Fig. 2) [8].

**TQM and ISO 9000**

The *ISO 9001*:1987 as the most important representative of the ISO 9000 series was issued to set a basis for quality management on a common level. Recently revised for the second time its former 20 element structure was abandoned in favor of a new pattern based on processes (Fig. 3). Customer requirements shall be transformed in customer satisfaction by a management system [2, 9, 10, 11]. The revised ISO 9000:2000 series are based on eight quality management principles. These principles can be used by senior management as a framework to guide their organizations towards improved performance. The principles are derived from the collective experience and knowledge of the international experts who participate in the ISO Technical Committee ISO/TC 176, Quality management and quality assurance, which is responsible for developing and maintaining the ISO 9000 standards.

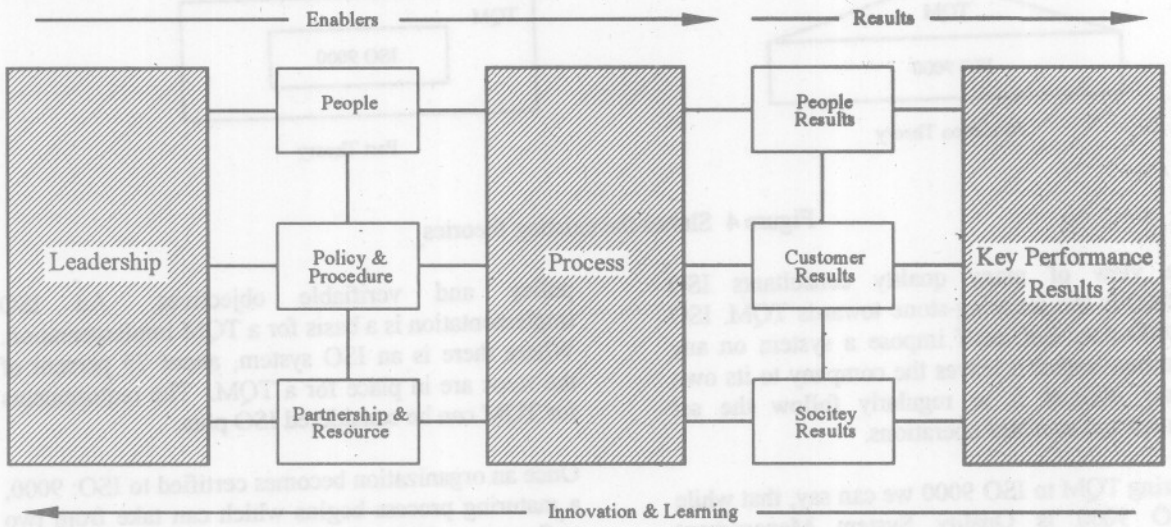


Figure 2 the European Quality Award Model

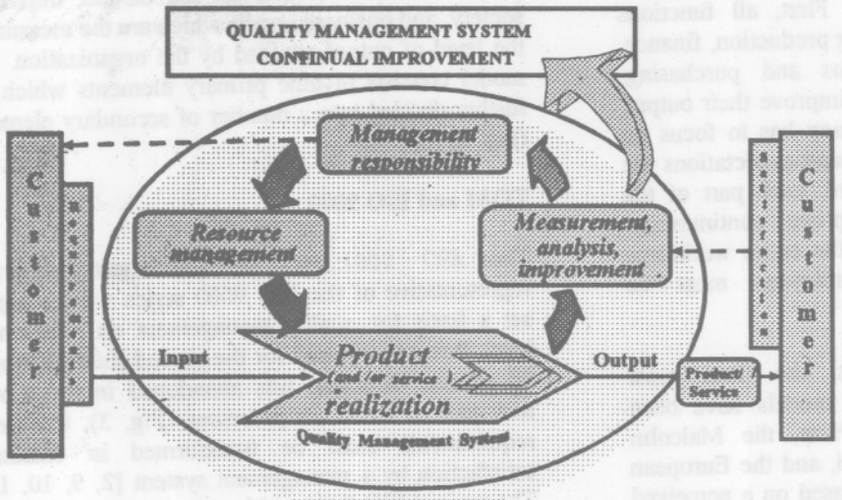


Figure 3 Process Model

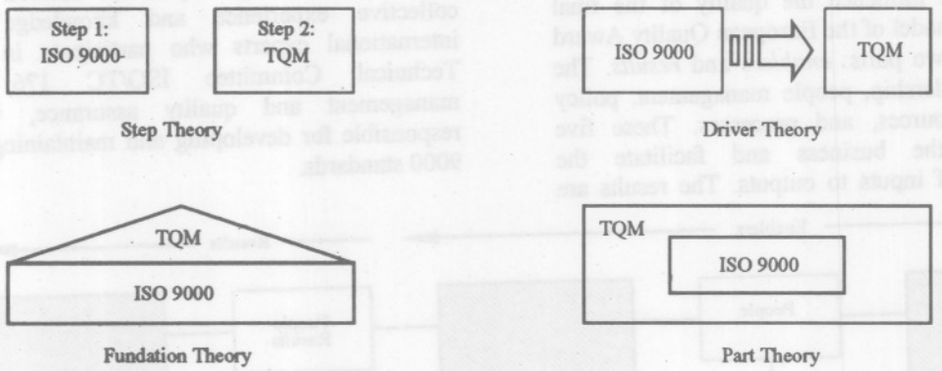


Figure 4 Shows the existing theories

In the view of many quality consultants ISO 9000:2000 is the stepping-stone towards TQM. ISO 9000:2000 does not itself impose a system on any organization; rather it leaves the company to its own and only obliged it to regularly follow the set procedures and standard operations.

Comparing TQM to ISO 9000 we can say, that while the ISO 9000 is Quality System Management Standard, the TQM is a philosophy of perpetual improvement. The ISO sets up a system to deploy a policy and verifiable objectives. An ISO implementation is a basis for a TQM implementation. Where there is an ISO system, about 75 percent of the steps are in place for a TQM. The requirements for TQM can be considered ISO plus.

Once an organization becomes certified to ISO: 9000, a maturing process begins which can take from two to five years. This is because naturally, human beings take time to adjust themselves for a given change. After the quality management system has matured

sufficiently, a vigorous program of team-based TQM could help to further improve quality. We are often asked whether or not there is any connection between the ISO 9000 and the TQM approach. Our response to this is that it is possible for any company to be certified to ISO 9000 without TQM, or a company can have TQM without ISO 9000. Generally, there are four theories existing regarding linking TQM and ISO 9000. These are: step theory; driver theory; foundation theory and element theory [12]. Figure 4 shows the four existing theories.

## QUALITY IN ETHIOPIA INDUSTRIES

With a total area of 1097 thousand square kilometers and population above 67 million, growing at a rate of 3% pa, Ethiopia stands as the fourth largest in size and the second populous country in Sub-Saharan Africa. The total labor force of the country constitutes about 48% of the population. The country is richly endowed with huge manpower, arable land and natural resources. However, much of its potential is not yet exploited [13].

A critical analysis of the evolution of manufacturing development shows that Ethiopia has a long history of artisan manufacturing activity. Large-scale manufacturing did not begin to play a significant role in the economy until the mid -1950s. Yet, amid the failure to promote indigenous small-scale industry, Ethiopia's industrialization prior to the mid – 1970s appears to have had mixed results. While it led to the expansion of aggregate economic activity, it did not do so in a particularly sustainable manner, in particular, the medium- and large-scale industries which were largely capital-intensive, relied very much on imports, and as such created relatively little employment opportunities [14].

The level of development of the manufacturing sector in Ethiopia is at its infancy; and the country's industrial base is very low. The share of intermediate and capital goods industry is very insignificant. According the survey of Central Statistics Authority of Ethiopia (CSAE), the total number of Large and Medium Scale Manufacturing establishments for the country as a whole was 796 in 1993 E. FY. The Ethiopian Large and Medium Scale Manufacturing Industry are mainly characterized by high concentration of food and beverages manufacturing industries that includes flour, bread, and edible oil, soft drinks, beer, and alcohol drinks [15].

In Ethiopian context, there are many reasons for enhancing and necessitate the promotion and application of quality, metrology and standardization. Among the many reasons economic development and technological progress are the main one. The following are the main reasons [16]:

- to fulfill international requirement and regulations;
- to fulfill national needs and responsibility and;
- to support the country export and import trades.

These reasons gave rise to the idea of establishment of one standard and inspection offices. So, in 1964, the government organizes "Standard Office" under the Ministry of Trade, Industry and Tourism. After a lot of efforts and different activities, an independent organization which is the Ethiopia Standard Institutes was established in 1970.

Since 1974, the country has adopted a centrally planned socialist economy system. Many state – owned enterprise set – up, and nearly all the private companies were confiscated or bought by the government. During this period, the Russian way of doing things influenced and dominated the quality management practices in Ethiopia. An enterprise was basically a factory or production unit where the production was assigned according to the central plans. The government has established special departments to perform both the procurement and marketing functions for industries. Because of quota system in a non competitive environment, the majority of companies had no clear quality vision and mission, and their management lacked the initiative to steer quality activities through corporate strategies and policies. Although many enterprises have introduced the quality control techniques, awareness was inadequate at that time. It was also common that no independent quality department or function was established in companies. There were several deep – rooted barriers of quality management. These include, but not limited to, the inability to plan for changes, the ignorance of cost of poor quality, the misconception of quality control and inadequate

education and training. Moreover, lack of customer focus made the situation deteriorate further and imposed difficulties in developing quality management practices in Ethiopia enterprises at the time.

The difficult situation had prolonged its effects throughout the whole country until the mid 1990s. In order to restart the engine of quality transformation efforts in Ethiopia, many challenges and difficulties were faced concerning changing the risk – avoidance culture among Ethiopian enterprises and rebuilding their confidence toward better reward and recognition that could be achieved through quality management practices. Despite the fact that almost all of Ethiopian enterprises were still in the early stage of quality control and promoting quality assurance practices, the progress has also moved to the subsequent diffusion of the ISO 9000 quality standards, and the concept of TQM in Ethiopia.

In 1987, the Ethiopia Standard Institute was renamed and has been raised to a status of an authority - The Ethiopia Standard Authority, taking the important practices of internal standardization into consideration. In 1998, The Ethiopia Standard Authority was re-established as a Quality and Standard Authority of Ethiopia (QSAE) [16].

## METHODOLOGY AND SURVEY DESIGN

This research represents the first of such empirical study on quality, TQM and ISO 9000 issues in Ethiopian and a questionnaire was used as the basis for the data collection so as to cover as wide a range of the heterogeneous population as possible. Issues such as the commitment to and awareness of quality, the understanding of ISO 9000 and TQM, reasons for ISO 9000/TQM implementation barriers, quality product problem, and emphasis placed on TQM and ISO 9000 related activities; formed the basis of the questionnaire.

Having designed the survey for, a model questionnaire was commented on by the Quality standard Authority of Ethiopia. The data were based on the year 1998/99, and samples of 100 manufacturing firms were selected out of 796 firms existing in the country drawn from CSAE [16]. The sample size was decided after considering the expected response rate, requirements for performing statistical analyses, and survey cost., Although the selected samples were limited to firms in the Amhara, Tigray, Harari, Dire Dawa, Oromiya and Addis Ababa region, it was assumed that the samples from these regions can give directions on the whole situation of manufacturing firms in Ethiopia.

### Survey Design - Questionnaire Development

In the field of quality management, a number of researchers have used questionnaire surveys. These include, for example, Flynn et al. [4], Saraph. [17], Mann [18], Damte [19], Zhang [20] Maheshwari [21] Ernst and Young and Blauw and During [3]. All of these researchers developed their questionnaires for data collection, based on their own research purposes, thus, their questionnaires differed from each other. After the questionnaires were examined, it was determined that some of them met the requirements of this research. This paper adopted the methods used by Damte [19], Zhang [20], Maheshwari [3] Ernst and Young [3] to the Ethiopian condition. In fact, the design of the research questionnaire was highly dependent on the concepts of literature survey.

The survey questionnaire contains 50 questions requiring four types of answers.

- The first types use a nominal scale, yes or no.
- A Likert scale of 1 to 6 is used for the second types, 1 representing strong agreement and 6 representing strong disagreement with the statement in the question.
- An Ordinal scale, not important, somewhat important, important and extremely important, is used for third types of questions.
- The fourth type requires need brief answer for subjective type questions.

The questions in this survey are categorized into five different sections with reference to Ethiopian industries.

The first category (1-7) was designed to understand the commitment of management towards quality in an organization. This set of questions was based on the philosophy of one of the quality gurus, Crosby [Error! Reference source not found.]. It included questions in the area of strategic decision making, importance of quality with respect to other decision-making factors, and involvement of management in quality-related issues.

The second category (8–11) was designed to understand quality performance. A Quality performance questions were prepared to understand the current status of quality standards in Ethiopian industry. The focus of these questions was customers' satisfaction and perception of quality of products of the organization.

The third groups of questions (12-24) were related to the causes of the poor quality. The objective of these questions was to evaluate the impact of factors such as process control, worker training, raw material and multiplicity of vendors on the quality of products.

The fourth category of questions (25–37) was contrived to encompass the improvement efforts in the quality management area. In this category, questions focused on several quality areas were designed. These areas included: level of employees involvement, commitment of management, future projections of quality improvement efforts, and quality as a factor in performance evaluation of employees.

The last categories (38–50) were devised to measure the commitment towards standardization of quality management practices and implementation of TQM. These questions are related to ISO 9000 and TQM. Several manufacturers in the international market are adopting ISO 9000 standards for quality systems. The aim of these questions is to estimate the willingness of Ethiopian manufacturers to adopt such quality standards. Two different sets of questions were designed in this group, one for ISO 9000 and another set for the TQM implementation.

### Survey Design - Design of Structured Interviews

The design of the structured interviews was based mainly on the research objectives, the research questions, the extensive TQM/ISO 9000 literature review, input from colleagues, and previous research conducted by other researchers. Before the structured interviews began, their content was pre-tested and minor alterations were made as a result. The discussions with the top officials of the company were dealing with general information about organizational characteristics, overall business performance, the effects of TQM/ISO 9000 implementation on overall business performance, TQM/ISO 9000 implementation process and benefits, organizational characteristics affecting TQM implementation, and TQM/ISO 9000 implementation practices used. Each interview took approximately ninety minutes and was conducted with the seven CEO of the company or a person from top management group.

## DATA ANALYSIS AND FINDINGS

The general picture that emerged from the interviews was a traditional approach to quality based on batch inspection of the end product and often 100 percent inspection of incoming and outgoing goods and material. This reflected the very marked lack of confidence in the ability of local suppliers and factory quality management system to provide goods fit for purpose.

### Survey Results

The results of the statistical analysis are presented in Appendix1. In the final analysis about 85% of the companies recommend changes from the way thing are done in their enterprises while only 15% do not recommend any change. Out of enterprises that have suggested a change 29% of them believe in the evolutionary change, 48% of them suggested that the revolutionary change would not affect too much of the status quo and 13% of the respondents believe the organization needs only trimming. So, from the above analysis it can easily be concluded that change is inevitable and a must for Ethiopian manufacturing industries.

### Interview results

Appendix 2 shows the summaries of the interview findings. The industrial managers questioned had a

low awareness of the main tenets of quality management as it has developed in the developed countries. Although there was a broad (but usually superficial) knowledge of ISO 9000, its relation to broader quality management issues was not generally understood. The implementation of Western type quality systems was extremely low.

**Findings**

The findings reveal the following insights with respect to the implementation of various quality initiatives in the Ethiopian manufacturing industry: some of the manufacturing companies understand the importance of involvement of top level management in quality improvement and they actively practice it; TQM philosophy and ISO 9000 QMS have been adopted in manufacturing; though no companies obtained quality certification; cultural change is the single most important inhibitor of quality policy implementation; and quality concepts have been diffused unevenly across major functional areas. Based on the survey, we can draw the following conclusions on current quality management situation in Ethiopia.

(a) The management level of many Ethiopian companies, especially those of public enterprises, doesn't have strong quality sense. In the 1990s Ethiopian manufacturing companies started TQM/ISO 9000 campaign learned from Japan and Western countries. Generally speaking they didn't have their own quality ideas or concepts. A lot of quality management work is superficial instead of fundamental. The focus of quality management is not for customer satisfaction and thus the quality management system is not customer driven.

(b) Because of the poor management commitment in quality, most enterprises don't have their own business culture to support total employees involvement in quality improvement. Thus the quality vision, mission objective statement and relative measures are not clear or do not exist. When quality conflicts with quantity, quantity is above quality and short term interest will override long term interest.

(c) Some managers have misconception about ISO 9000. The current quality system of some Ethiopian manufacturing companies was set up based on the requirement of ISO 9000 (1994). When implementing ISO 9000, they focused on the paper work rather than results. After passing ISO 9000 registration, they assume that they are having a world - class quality system. In fact, ISO 9000 is very basic and fundamental and it does not have specific requirements on customer's satisfaction and continuous improvement which are key business to survival.

(d) In many manufacturing companies in Ethiopia, because they don't have systematic quality training program, people in quality and other departments are not familiar with quality tools and thus quality improvement can not be achieved in a systematic way.

(e) Quality efforts in Ethiopia were initiated by top – down approach at different times, especially by officials in Prime Minister Offices, QSAE and Ministry of Trade and Industry. Most works and efforts in quality movements didn't involve the prime actors and most of the initiatives were unsuccessful even some of the implemented works failed as result of reshufflings of higher officials.

(f) By carefully analyzing the causes and quality problems, we can easily identify and understand the different perception and misconception about quality in developing countries [16]. These perception and misconception are:

**Higher Quality costs more**: This is the most widely held misconception about quality. However, new insights into the mechanisms of quality building and manufacturing process have shown that high quality does not necessarily cost more.

**Emphasis on quality leads to reduced productivity**: There is a widespread notion among production managers that quality can be achieved only at the cost of quantity. This view is a legacy of the period when quality control consisted largely of physical inspection of the end – product.

**The labor force is entirely to blame for poor quality**: Manufacturers in developing countries often blame the low quality of their products on the lack of quality consciousness and poor work culture of their workers.

**Quality improvement requires large investments**: There is a widely held notion that an organized quality improvement program needs heavy investment in new plant and equipment. However, this is not necessarily true. Plants constitute only one components of a total quality system and by themselves, they are not sufficient to assure high quality.

**Quality can be assured by strict inspection**: Inspection was the first formal quality – control mechanism at the beginning of this century and most manufacturers still believe that quality can be improved by strict inspection. It should be clearly understood that inspection can only lead to the segregation of good from bad pieces; it can not by itself improve the quality of a manufactured product.

## QUALITY MANAGEMENT MODELS

Quality improvement programs for Ethiopia should be tailored to the specific conditions of every enterprise, department, and work place. The aim of this paper is to suggest customized QMS to the Ethiopian manufacturing industries. To select quality management model that will suitable for Ethiopian conditions, it is useful first to analyze and draw the lessons from two approaches to quality improvement already attempted in Ethiopia and one approach highly implemented in developed countries. The findings presented earlier will provide helpful data to guide and inform this discussion. The quality methods in question are: Total Quality Management (TQM); ISO 9000; Business Excellence; and Model adapted to Ethiopian conditions.

### Total Quality Management (TQM)

"It worked in Japan so why wouldn't it work here?" This is a common phrase whenever we want directly to implant an idea. We often fail to recognize the importance of culture and its influence in transplanting what has worked in a different cultural setup, organizational structure and individualism without reviewing its compatibility or incompatibility with different cultures. Generally, when we think implementing TQM in our country, we must consider:

**Culture:** First, it is time taking to change culture, if not impossible. Clearly, organizational culture reflects the beliefs and value system of members of the organization and the way to change it is by changing the beliefs and values of these members. But, these are values that have been internalized and form a basis of behavior. Thus, care and caution must be exercised in trying to modify this behavioral pattern. Different country has different cultures, some of them are inborn from their tradition and ethical value system, and these often influence their organizational culture. Quality management in itself is a culture and it should be adapted to different economies. The same goal or purpose can be achieved through different directions. As a result, it recommended that organization assesses its present culture and determine if its environment is supportive of quality management before it makes a transformation to quality.

It is evident that there is a need for cultural transformation. Such transformation must be cognizant of the cultural needs of workers. Workers must align their survival to organizational survival and understand that improve work performance and work processes can only help to enrich their wellbeing and culture. Management must invest in the future of their workers since people are, perhaps, the greatest asset of any organization. Thus, they must adopt a long term view and develop their human resources through education, on-the-job training and enrichment and awareness programs. The issue again is more critical in country like ours due to the high illiteracy rate and the largely unskilled labor force. So, this stage of immature quality management practice calls for proper transformation and the need for systematic approach towards TQM.

**Organizational structure:** For successful TQM implementation, some studies argue that a cross-functional matrix organization structure would expedite and coordinate across cross-functional interfaces (Dale, Cooper, and Wilkinson 1997).

Besides, a flatter organizational structure is often preferred, with less social distance between manager and workers (Bounds et al. 1994). From the survey study, it is more difficult to achieve in Ethiopia because dominant Ethiopian culture reflects concentration of power, paternalism and personalization. Power sharing is, however, necessary in order to develop a total quality management practices.

**Group work/Individualism**: In addition to that, total quality management experts advocate teamwork rather than individualism. The process of change, however, has to be introduced gradually, and is required to have a shared responsibility with a cooperative work force; a harmonious, balanced, and team working relationship; and empowered workers. Deming's 14 points of management, with reference to the Ethiopian case, we note that "point 8: drive out fear so that everyone may work effectively for the company" may be in direct conflict with concentration of power because absolute power corrupts absolutely and may limit contribution to work matters; introduce fear and anxiety; and may cause physical and psychological disorders. Furthermore, individualism discourages team work, and pits workers against each other as they compete internally and target numerical goals.

## ISO 9000

As claimed by the ISO fact sheet, "ISO 9000 is now a vital part of the way the world does business. It is a universal quality ideal that is widely understood and transcends language and cultural barriers." The implementation of ISO 9000 in the world is good demonstration for this statement [9].

The deviation in understanding the role of ISO 9000 certification has caused some problems in the Ethiopia quality improvement programs. For example, some manufacturing industries that are especially export oriented in the 1990s have endeavored to attain ISO 9000 certification to penetrate the international markets. Therefore, the awareness and adoption of ISO 9000 increased significantly at that time. In the process of ISO 9000 implementation, however, barriers, difficulties, and problems arose. Owners and top management are committed to the implementation of ISO 9000 simply because of perceived market needs, but they neither had the quality awareness nor had did not have the experience and training to lead the implementation program systematically on a company wide basis.

It is evident that ISO 9000 implementation and certification can help companies:

- Establish the sense of globalization and prepare for the Ethiopian affiliation to world trade organization (WTO);
- Establish systematized management models that optimize its own organization and institute a mechanism reducing and eliminating quality defects through prevention;
- Trigger the building and strengthening of technical capabilities and restructuring of products and services, and improve their quality management by clearly defining accountability and responsibility.

The survey showed that ISO 9000 was seen as important to compete in world markets but less so in the domestic context. The criticism that an ISO 9000 approach emphasizes control and conformism, at the expense of flexibility and innovation, is significant in the Ethiopia context because many managers, most of who involve in the quality control tradition, will be comfortable working in this framework. The potential advantages of this approach could harmonize inherited industrial traditions, recognized as important in the transition from traditional quality control to modern quality management practices.

The cost of implementation and certification of by the third party certification systems is a major factor for Ethiopian organizations. Meeting the cost of upgrading the infrastructure to meet international standards and the initial and ongoing costs of certification is only possible for organizations in a few financially viable sectors such as export oriented; even in this area also aid from western and other developed countries is usually required.

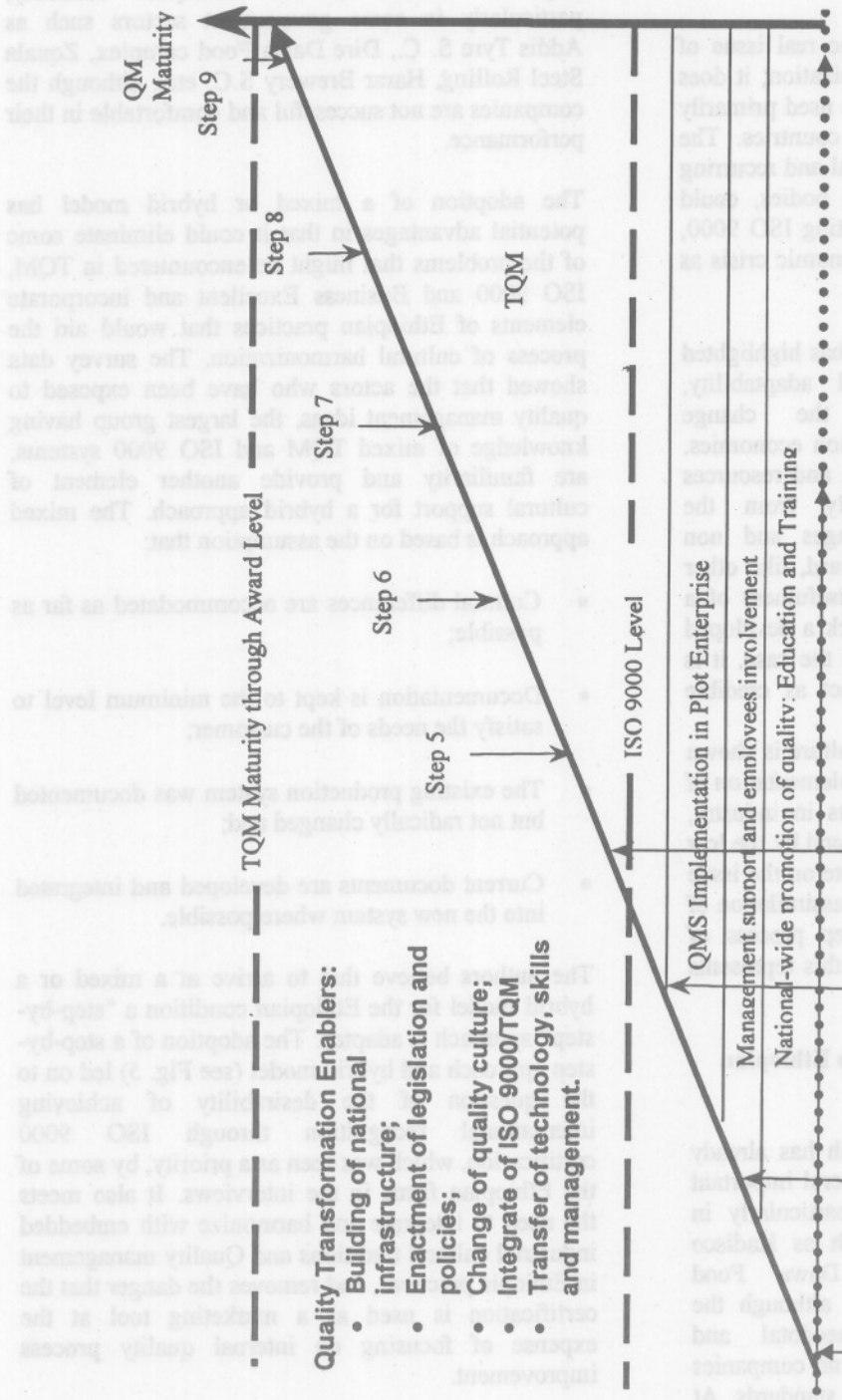


Figure 5 Proposed Quality Management Model and Step-by-Step Approach for Implementing Quality Model in Ethiopia

**Excellence Model**

The Excellence model focuses on the real issue of quality improvement inside the organization; it does not provide a certificate that would be used primarily as a marketing tool for developed countries. The external cost to the organization, initial and recurring fees to consultants and certification bodies, could also be lower compared to implementing ISO 9000, an important factor in the present economic crisis as mentioned above.

There is a growing body of work that has highlighted the importance of flexibility and adaptability, particularly local adaptability, the change management strategies for the transition economies. Such an approach allows information and resources to be mobilized more effectively from the environment. Despite these advantages and non existence of the Ethiopia Quality Award, like other countries and the doubts about the usefulness of a self-assessment approach concerns lack a developed quality management culture. If this is the case, it is unlikely that they will be able to act as credible national champions and role models.
A relatively underdeveloped quality culture is shown by the low levels of awareness and implementation of Western quality management concepts in industry, are revealed both by the evidence here and by the low level of academic publication and debate on the issue found in a literature search. Since the assimilation of the Excellence model requires a deep process of management change through learning, this represents another obstacle to its implementation.

**A Mixed or hybrid Model Adapted to Ethiopian Conditions**

It is likely that an ISO 9000 approach has already been adapted to a certain extent in several important sectors of the Ethiopian economy, particularly in some private and public sectors such as Kadisco Chemicals, Thermoplastic, Dire Dawa Food complex, Dashen Brewery S.C. etc., although the evidence to support this is anecdotal and fragmentary. Up to this point in time, no companies in Ethiopia are certified for ISO 9000 standards. At the same time, TQM implementation approach has already been adapted to a certain extent in several important sectors of the Ethiopian economy, particularly in some government sectors such as Addis Tyre S. C., Dire Dawa Food complex, Zquala Steel Rolling, Harar Brewery S.C. etc., although the companies are not successful and comfortable in their performance.

The adoption of a mixed or hybrid model has potential advantages in that it could eliminate some of the problems that might be encountered in TQM, ISO 9000 and Business Excellent and incorporate elements of Ethiopian practices that would aid the process of cultural harmonization. The survey data showed that the actors who have been exposed to quality management ideas, the largest group having knowledge of mixed TQM and ISO 9000 systems, are familiarity and provide another element of cultural support for a hybrid approach. The mixed approach is based on the assumption that:

- Cultural differences are accommodated as far as possible;
- Documentation is kept to the minimum level to satisfy the needs of the customer;
- The existing production system was documented but not radically changed and;
- Current documents are developed and integrated into the new system where possible.

The authors believe that to arrive at a mixed or a hybrid model for the Ethiopian condition a "step-by-step" approach is adapted. The adoption of a step-by-step approach and hybrid model (see Fig. 5) led on to the question of the desirability of achieving international recognition through ISO 9000 certification, which was seen as a priority, by some of the Ethiopian firms in the interviews. It also meets the need to integrate and harmonize with embedded industrial cultural traditions and Quality management in Ethiopia practices, and removes the danger that the certification is used as a marketing tool at the expense of focusing on internal quality process improvement.

The proposed approach covers nine steps starting with the stage the traditional quality control practice

in the organization. The ultimate aim is to reach a level of high quality management maturity, for which the quality award model gives formal and systematic evaluations and improvements plans. The implementation of self-assessment based on those award models can help in bridging the gap between ISO 9000 and TQM.

***Step 1:*** **National quality movement/ National quality policy**: In our country, up to now quality improvement program has been undertaking by individual initiation. This kind of effort has not been successful due to problems of sustainability. Hence, integrated and coordinated national quality program is essential to develop quality awareness among people, customers and consumers of products and services and among companies, which are producers and suppliers.

***Step 2:*** **Develop vision and promote a policy on quality**: Government has to taken the responsibility for the development of national quality policies and support systems providing assistance to all enterprises to understand the principles of quality and to develop quality conscious in business behavior, which leads in turn to the satisfaction of customers, thus assuring the survival and development of companies within the condition of market economies.

***Step 3:*** **ISO 9000 implementation and registration**: Many organizations are familiar with the ISO 9000, therefore to harmonize with our cultural background a logical starting point for organization is ISO 9000 implementation. The main reason for taking this as the baseline is that continuous improvement is only effective if an organization understands the processes which are underlying the activities that need to be improved.

***Step 4:*** **Launch quality and business award model**: Quality and business excellence awards that recognize excellent organizational performance have emerged as a significant component of the productivity and quality promotion strategies of many countries. Several national and regional quality awards have been established to promote quality and serve as models of total quality management (TQM). One of the best practices associated with continuous improvement is that self-assessment techniques using a recognized business excellence model (such as the Baldrige Award) help identify opportunities for improvement areas across the organization and promote a holistic approach to continuous improvement.

***Step 5:*** **Vision based on an award model**: After obtaining ISO 9000 certification, an organization should study quality and business award model to gain an insight into what is necessary to develop a TQM approach to manage the business. This is especially important if there is a lack of organizational history with respect to structured continuous improvement or a low awareness of the importance of quality. In this situation, the first action to take is to develop such awareness amongst employees and to ensure their involvement in improvement activities.

***Step 6:*** **Develop a plan to put the basic elements of TQM in place**: Having identified the gap the organization then needs to look at the various methods, both prescriptive and non-prescriptive, of introducing the basics of TQM. These include the teachings of international quality management experts such as Crosby, Deming, Feigenbaum and Juran, the packages of various management consultancies and other forms of guidance.

***Step 7:*** **Develop the commitment to self-assessment**: Once the decision has been made to carry out self-assessment, the first step is to develop appropriate awareness amongst the management team with regard to the details of the quality and business award model which is being used. The criteria that underpin the chosen model will help enhance managers' understanding of TQM; however, they will have to work at making the general descriptions of the criteria more relevant to the context of their business.

***Step 8:*** **Start self-assessment**: The next step is to create, within the organization, appropriate expertise on self-assessment. One method is to send managers for assessor training to develop their understanding and gain experience on the self-assessment process. In this way these managers will form the critical mass within the organization to start internal assessor training for the remainder of the management group.

***Step 9:*** **Full self-assessment**: After a small number of pilots have been undertaken a decision will need to be taken concerning which model, criteria, and self-assessment process and are to be applied throughout the whole organization. The only way to get every business unit involved is by the application of pressure, either by creating a link with the ISO 9000 series registration managerial bonus or by edict from the chairman, making self-assessment part of every manager's job.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the survey to 55 manufacturing companies in Ethiopia, this paper addresses the current situation of quality management in Ethiopia. Strategies for improving the situation are also presented which hopefully to be useful for Ethiopian manufacturing industries. The survey is not a random sampling from manufacturing companies in Ethiopia. The companies we surveyed are located in the central cities and cities of high industry level. Most of them are well-known companies in Ethiopia and thus they represent the high level of quality management in Ethiopia. Even though the authors did not conduct surveys to companies in the southern region, we believe the strategies presented in this paper are applicable to them also. Directing one's activities towards quality management is a good way to gain efficiency, effectiveness, competitiveness and competitive advantage thereby ensuring longer-term success in meeting the needs of customers, employees, financial and other stakeholders and the community. The implementation of Quality Management programs can achieve significant benefits such as increased efficiency, reduced costs and greater satisfaction, all leading to better performance for the organization.

With Ethiopia's entry to WTO in the near future, Ethiopia's manufacturing companies are facing global competition. How to improve product quality and thus improve the overall competitiveness is vital to Ethiopian economy. The level of awareness and understanding of TQM and ISO 9000 is in fact very low. There is a miss-match between the number of respondents who think that they are aware of TQM and ISO 9000 and those who correctly understand what quality is all about. In order to adopt the proposed QMS, the following approach is suggested:

- *Top management should sustain their commitment to quality improvement initiatives and take an active role in all quality management activities.* The high level of visibility of top management will reinforce the organization's commitment to quality and provide the much needed motivation to lower level employees. A top level ``champion" must drive the quality initiative throughout the organization and provide the necessary leadership.

- *A program of on-going, on-the-job education and training needs to be developed and implemented.* This will require substantial resources to be allocated both in terms of people and facilities. Top level managers must first learn the philosophy and methods of quality improvement and then teach these to lower level employees.

- *A culture of teamwork and co-operation must be developed throughout the organization.* Education and training will play a key role in this respect. An atmosphere of trust and sharing must be developed where all employees respect each other and willingly participate in activities.

- *The application of the appropriate tools and methods of quality management/control must be encouraged by all employees.* The positive effects of the use of these tools and methods on both operational and financial performance must be demonstrated to all employees.

- *Launching a National Quality Award Initiative:* A national effort to promote quality and service excellence of organizations both in the public and private sector will have beneficial implications for competitiveness and economic development.

- *Encouraging ISO 9000 Registration of Export Oriented Enterprises:* In addition, going through the certification process helps identify potential areas for improving quality and efficiency.

Acquiring a better understanding of the internal quality management process by the firm and meeting the extensive documentation requirements called for by the ISO certification process could also serve as a strong foundation for implementing more comprehensive quality improvement approaches such as Total Quality Management (TQM), or improving the odds of winning the national quality awards, if any.

- *Quality, Standardization, and Metrology Infrastructure:* Today it is increasingly recognized that a technological conformity assessment infrastructure is a basis condition for success of economic policies for achieving sustainable development. Creating such an infrastructure to develop in our country is essential for improving productivity, market competitiveness, and export capability through building the following system: a system for metrology with international accepted measures; a system for standards and technical regulations; system for conformity assessment as well as the wide dissemination of quality management and productivity improvement system.

- *Strengthen strategic alliance to reduce ISO registration cost:* Only recognized registrars could certify firms for ISO compliance. (Registrars operate like Certified or Chartered Public Accountants.) The registrar reviews each company's quality system and, if it determines that the firm has met the quality standards set by ISO, it certifies the firm's compliance with the required standard(s). The cost to obtain ISO registration for small to medium sized companies ranges from US$10-30,000/year that is very high, and is almost prohibitive, for most Ethiopian enterprises. By working with DEVCO (the unit of ISO that focuses on developing country issues), the government should explore alternative approaches to assist certain companies in key industries to get ISO certification.

- *Create a total quality-oriented culture: The efforts to adopt TQM will succeed only if a cultural change is brought about.* This can be achieved by focusing on cultural traits in the organization. One important lesson all Ethiopian managers and employees must learn from the developed countries companies is that the practice of quality improvements is a journey without an end. The development of a culture of continuous improvements and co-operation can close much of the gap between the developing countries and the developed countries. Teamwork and trust are the key elements of such a culture.

Future research should address the issues generated in this study. First, a replication of this study should prove helpful in re-examining the validity of its findings. Further empirical studies using larger sample sizes and greater geographical diversity may be helpful in validating specific parts of the model proposed in this study.

Another area of future research should be to expand on this study and include more variables so that the applicability of the findings could be improved. This study did not include behavioral and cultural factors in the formulation of the propositions. Future researchers should use the same general format of this study, and include some of the variables mentioned above.

## REFERENCES

[1] Gitlow, H., Gitlow, S., Oppenheim, A. and Oppenheim, R. (1989), Tools and Methods for the Improvement of Quality, IRWIN, Homewood, IL.

[2] ISO 9000: Quality Management System – Fundamentals and vocabulary, 2nd ed., Switzerland, 2000.

[3] Ernst & Young, E. Y. and American Quality Foundations, International Quality Study: The definitive study of the best international quality management practices, 1994.

[4] Flynn, B.B., Schroeder, R.G. and Sakakibara, S. (1994), a framework for quality management research and an associated measurement instrument, *Journal of Operations Management.*

[5] Taguchi, G., *Introduction to Quality Engineering*, Asian Productivity Organization, Tokyo, 1986, p. 1.

[6] Crosby, P. B., Quality without Tears: The Art of Hassle – Free Management, McGraw – Hill Company, New York, 1984.

[7] Madu, V. (1997), "Quality management in developing economies", International Journal of Quality Science, Vol.2 No. 4, PP 272 – 91.

[8] EFQM, home page about EFQM http://www.efqm.org.

[9] ISO Fact Sheet - http://www. resourcesforlife. com / library/organizations/iso/

[10] ISO 9001: Quality management systems – Requirements, 3rd ed., Switzerland, 2000.

[11] ISO 9004: 2000, Quality management systems – Guidelines for performance improvements. 2nd ed., Switzerland, 2000.

[12] Sun, H., Linking ISO 9000 and TQM: A literature Review, Department of manufacturing Engineering and Management, City University of Hong Kong, 2000.

[13] An Investment Guide to Ethiopia, International Chamber of Commerce (ICC) and United Nations Conference on Trade and Development, June 1999.

[14] UNIDO, Industrial Development Review Series: accelerating industrial growth through Market reforms, 1996.

[15] CSA:2000/2001,Central Statistics Authority, Report on Large and Medium Scale Manufacturing and Electricity Industries Survey.

16] QSAE http://www.qsae.org.com/

[17] Saraph, J.V., Benson, G.P. and Schroeder, R.G. (1989), An instrument for measuring the critical factors of quality management, *Decision Sciences*, Vol. 20, pp. 810-829.

[18] Mann, R. and Kehoe, D. (1994), An evaluation of the effects of quality improvement activities on business performance, International Journal of Quality & Reliability Management, Vol. 11.

[19] Damte, G., Implementing TQM in the technical Services of Ethiopian Airlines, July 2001, Addis Ababa.

[20] Zhang, Z.H. (2000a), developing a model of quality management methods and evaluating heir effects on business performance, Total Quality Management, Vol. 11 No. 1, p. 129-137.

[21] Maheshwari, S.K., Xiander Zhao, Benchmarking Quality Management Practices in India, Journal of Benchmarking Quality Management, 1994.

[22] Oakland, J.S., Total Quality Management: The route to improving performance, Nichols Publishing, New Jersey 3rc Editor, 1995

[23] Garvin, D.A. (1087), Competing on the eight dimensions of quality, Harvard Business Review, Vol. 65 No. 6, pp. 101-109.

## APPENDIX 1.
## SURVEY RESPONSES SUMMARY TO QUESTIONNARIES FOR QUALITY MANAGEMENT PRACTICES IN ETHIOPIAN INDUSTRIES (2002/2003)

**General Information**

| | |
|---|---|
| Total number of questionnaires distributed | 92 |
| Number of Respondents in number | 55 |
| Respondent in percent | 60% |

**Response data**

| Questions | Response rate in percent (%) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Q1. Quality is considered as a strategic issue and top management is actively involved in managing the quality in your company. | 53 | 27 | 9 | 4 | 2 | 5 |
| Q2. In your organization, top management has a philosophy of pushing towards perfection in production. | 42 | 42 | 9 | 3 | 2 | 2 |
| Q3. In your experience within this organization, reduction of rejects has not resulted in increased costs in the long run. | 29 | 22 | 16 | 18 | 4 | 11 |
| Q4. Acceptable quality level (AQL) is considered a superior tool in managing quality at your organization. | 49 | 33 | 11 | 5 | – | 2 |
| Q5. Company's management emphasizes defects and their cause more than the total production. | 27 | 27 | 22 | 7 | 6 | 11 |
| Q6. Delivery of non-conforming products to customers, even at the cost of losing an order is unacceptable in your organization. | 49 | 24 | 5 | 7 | 8 | 7 |
| Q7. Quality is a responsibility of everyone in your organization, rather than a specialized staff responsibility at your organization. | 46 | 24 | 20 | – | 5 | 5 |
| Q8. The quality of your products is compatible with the quality of the products manufactured by the market leaders in the global marketplace. | 26 | 33 | 26 | 7 | 5 | 7 |
| Q9. Customer services provided by your company are better than those provided by your competitors. | 27 | 34 | 22 | 9 | 4 | 4 |
| Q10. Customer are satisfied with the quality of the product(s) your company ,manufactures. | 45 | 31 | 18 | 2 | 4 | - |
| Q11. Customers are satisfied with the quality of services your company provides. | 24 | 46 | 24 | 4 | 1 | 1 |

Q12. Which division/department is responsible for quality problems?

| Responsibility for quality in an organization | Percent |
|---|---|
| • Quality control department/service | 30.9% |
| • Production and technical department/section | 29.1% |
| • Production and technical department/section and Quality control department/service | 21.8% |
| • All department in an organization | 16.4% |
| • Top management | 1.8% |

Q13. Are there quality problems? Yes 72.7% No 23.6% No response 3.6%

**Summary of Existing Quality Problems and Causes**

| |
|---|
| • The processing machinery and equipment are too obsolete. |
| • The market value of quality product does not invite to improve quality since it requires considerable cost. |
| • The problem of inconsistency in product quality. |
| • There are some defects in the process of production due to uncontrolled process/operation. |

| |
|---|
| • In the production processes, there are considerable losses of raw material in the form of scrap, wastage. |
| • No process improvement techniques implemented to increase productivity and decrease cost. |
| • Scarcity of quality raw material in local market. |
| • The level of quality awareness is generally poor in society, top management, and work force. |
| • Unavailability of measuring, testing, and other quality control devices. |
| • Less attention has given by policy makers and top management. |
| • Lack of good warehousing for raw material and final product. |
| • Absent of trained qualified manpower and expert in quality management and related issues. |
| • Unsuccessful implementation and wrong perception about quality in general TQM in particular. |
| • Vendors are evaluated based on price not on quality. |

| Questions | Response rate in percent (%) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Q14.Fast action should be taken to customer complaints and the lessons learned incorporated to prevent recurrence. | 60 | 22 | 14 | 2 | _ | 2 |
| Q15.For a defect in a product/service, which undergone through more than one department, all the departments are responsible for the defect no matter, how well they have done their part. | 30 | 20 | 18 | 9 | 9 | 14 |
| Q16.Inadequate training of workers is a major cause of poor product quality in your company. | 20 | 20 | 34 | 4 | 11 | 11 |
| Q17. Defective raw materials are a major cause of defects in the products your company produces | 22 | 16 | 24 | 7 | 6 | 25 |
| Q18. Poor process control is a major cause of defects in the product your company produces. | 15 | 25 | 22 | 13 | 9 | 16 |
| Q19. Having too many vendors for the raw material or parts is a major cause of poor quality. | 14 | 14 | 24 | 9 | 7 | 31 |
| Q20. Lack of commitment from top management to motivate workers for quality is a major cause of poor quality and barrier for implementation quality management system. | 13 | 29 | 13 | 5 | 15 | 25 |
| Q21. Lack of quality consciousness by design engineers is a major cause of poor quality in your company. | 7 | 13 | 16 | 11 | 9 | 44 |
| Q22. In adequate knowledge and Understanding about quality management is major barrier for implementation of quality management system provided by your competitors. | 25 | 16 | 22 | 9 | 11 | 17 |
| Q23. Fear and resistance to change is major barrier for implementation of quality management system. | 20 | 25 | 24 | 11 | 6 | 14 |
| Q24. Policies, rules, and procedures are major barrier for implementation of quality management system. | 16 | 21 | 21 | 7 | 7 | 28 |
| Q25. Product sales are properly followed through to determine customers' satisfactions. | 40 | 32 | 18 | 2 | 4 | 4 |
| Q26. Quality-related customer complaints are treated with the top priority. | 42 | 40 | 12 | 4 | _ | 2 |
| Q27. In general in your company, product-related complaints are resolved up to the customers' satisfaction. | 51 | 34 | 7 | 2 | 4 | 2 |
| Q28. Your organization maintains consistent quality standards throughout the year. | 31 | 33 | 24 | 4 | 4 | 4 |
| Q29. At your organization, shop floor workers are encouraged to suggest and try methods to improve product quality. | 27 | 20 | 31 | 7 | 4 | 11 |

| Questions | Response rate in percent (%) | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Q30. How frequently does your company use quality information to evaluate business performance? | 31% | 46% | 14% | 9% |
| Q31. How important is quality performance of the company as a criterion for evaluating senior executive performance in your company? | 20% | 53% | 23% | 4% |
| Q32. How important will quality performance of the company is as a criterion for evaluating senior executive performance in your company? | 42% | 40% | 9% | 9% |
| Q33. How important is quality performance of the company as a criterion for compensating senior executive performance in your company? | 18% | 51% | 22% | 9% |
| Q34. How important will quality performance of the company is as a criterion for compensating senior executive performance in your company in the future? | 51% | 35% | 7% | 7% |
| Q35. How much importance does your company place on customer satisfaction in strategic planning? | 54% | 34% | 4% | 8% |
| Q36. How frequently do you incorporate customer expectations into the design of new products and services? | 27% | 44% | 16% | 13% |
| Q37. How important is the application of new technology in meeting customer Expectations? | 44% | 36% | 14% | 6% |

Q38. Is your company involved in total quality management or other continuous improvement program?
Yes 27% No 73%

Q39. If you have not implemented TQM or other continuous improvement program yet
Then; 39.1 Have you heard about TQM before? Yes 95% No 5%
39.2 Do you think TQM will be helpful for your organization? Yes 95% No 5%
39.3 Do you have planned to implement TQM sometimes in the future? Yes 85% No 15%

Q40. Is your company certified for ISO 9000 standards? No 100%

Q41. Have you applied for ISO 9000 certification? Yes 5.5% No 94.5%

Q42. Is your company planning to apply for ISO 9000 standard certification in the near future?
Yes 43.6% No 50.9% No Response 5.5%

Q43. Do you have a current quality manual? Yes 29.1% No 70.9%
a) Compliant to ISO 9001 – 94 2
b) Compliant to ISO 9002 – 94
c) Compliant to other standard: Specify 4 (such as Coca Cola quality system)

Q44. Has your company improved the documentation for quality in the past year? Yes 40.0% No 60%

Q45. In your industry, is internal quality audit for improvement of quality control and Process improvement is the useful? Yes 83.6% No 16.4%

Q46. Do you often refer to the company policy manual before taking actions on those which require policy compliancy and you have doubts what the correct action is? Yes 45.5% No 50.9% No response 3.6%

Q47. Have you been taking action for continuous process improvement to improve the ways things are being done?
Yes 85.5% No 18.2%

Q48. Do you recommend a change from the way things are done in your industry? Yes 85.5% No 14.5%

Q49. How would you suggest? (Based on your responses for the previous questions)
a). Revolutionary change not to affect too much the status quo. 47.3%
b). Evolutionary change not to affect too much the status quo. 29.9%
c). the way we are doing is fine and needs only trimming. 12.7%
d). others (please specify) 10.9%

Q50. Do you propose for quality improvement? Yes 89.9% No 10.9%

## APPENDIX 2

## SUMMARY OF INTERVIEWS ON QUALITY PRACTICES AND AWARENESS IN ETHIOPIAN INDUSTRIES

| Interviewee and position | Name, nature of organization, position | Approach to quality | Documentation in use | Quality dep't manager in post | Knowledge of ISO and TQM |
|---|---|---|---|---|---|
| Ato Dawit Mogese, General Manager | Thermoplastic P.L.C., Chemical, Addis Ababa | ISO 9000 | - Quality Manual<br>- Technical Standard | Yes | TQM<br>ISO 9000:2000 |
| Ato Shewaleul Ayele, Quality Department Manager | Dashen Brewery, Gondar | ISO 9000 | - Quality Manual<br>- Technical Standard | Yes | ISO 9000<br>TQM – Superficial knowledge |
| Ato Wondimu Degenetu, Technical Directorate | Basic Metal and Engineering Industry Agency, Metal, Addis Ababa | Traditional quality control | - Technical Standard | No | ISO 9000<br>TQM |
| Ato Alemayehu Emiru, Research and Development Head | Addis tyre Co. S. C., Chemical, Addis Ababa | TQM and ISO 9000 | -Quality Manual<br>- Technical Standard | Yes | ISO 9000<br>TQM |
| Ato Juneidi Basha, General Manager | Hara Brewery S. C., Beverages, Harar | TQM and ISO 9000 | -Quality Manual<br>( In Preparation)<br>- Technical Standard | Yes | ISO 9000 - superficial<br>TQM |
| Ato Selehadin KHalifa, General Manager | Kadisco Chemical Industry, Addis Ababa | ISO 9000 | -Quality Manual<br>- Technical Standard | No | ISO 9000<br>TQM |
| Ato Zerihun Hailu, T/General Manager | Dire Dawa Food Complex, Food, Dire Dawa | TQM and ISO 9000 | -Quality Manual<br>- Technical Standard | NO | ISO 9000<br>TQM |