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## **ASSESSING THE EFFECTIVENESS OF KAIZEN IMPLEMENTATION IN WONJI SUGAR FACTORY PLC**

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*Tigist Hailegiorgis Workneh (Mrs.)*

JUNE 2015  
ADDIS ABABA, ETHIOPIA

**ASSESSING EFFECTIVENESS OF KAIZEN  
IMPLEMENTATION IN WONJI SUGAR FACTORY PLC**

**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL  
OF GRADUATE STUDIES IN PARTIAL FULLFILMENT OF THE  
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## **DEDICATION**

This work is dedicated to the entire family: my late Mum and Dad - Madam Etenesh Misganaw and Mr. Hailegiorgis Workneh, respectively, for their being the reason of my coming to this world and getting this level; my husband, Mr. Zenebe Gebresellassie Dori, and my children Estifanos and Yonas Zenebe, for their immense contribution towards my studies.

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To the Management and staff of Wonji Sugar Factory and Sugar Corporation Kaizen Office, I say “you deserve big thanks” for opening your doors to me any time I walked into your organization’s premises. I sincerely appreciate your unreserved support in providing me with the necessary data.

## ***Abstract***

*Kaizen originated in Japan to be applied in the improvement of productivity, quality, efficiency and, all in all, business excellence. Though it has been an internationally recognized tool for continuous improvement, it is of a short age to be practiced in Africa, in general, and in Ethiopia, in particular. The Government of Ethiopia introduced Kaizen as one of the change tools and directed some 30 organizations to apply it at the beginning. However, not much has been done to assess its effectiveness and challenges encountered in the implementation process. The purpose of this paper was to find out the effectiveness of kaizen implementation in Wonji Sugar Factory and provide the factory and other interested party with the result of the study and improve and/apply its implementation process. It has, therefore, studied the achievement of Kaizen, the linkage between Kaizen implementation with the Strategic Objectives of the factory, the improvements of employees' behavior and working environment, the technical and social outcomes, productivity improvement and the social system outcomes with continuous improvement, in Wonji Sugar Factory, one of those organizations which have been applying this technique for more than three years, as a purposive sample technique survey questionnaire, interviews and direct observations have been applied based on different performance indicators related to inputs, outputs and process of Kaizen implementation techniques. The respondents for the questionnaires have been involved from different departments of the factory each using simple random sampling. Interviews were made with Kaizen Steering Committee and observations were also done the researcher through paying visits to the factory. Accordingly, it has been found that Kaizen implementation in Wonji Sugar Factory has been found successful in terms of minimization of waste and, as a result production cost reduction, increasing efficiency, creation of good relationship between employees and management, increasing employees' attitude towards teamwork, facilitation of the factory's conducive working environment and improving work commitment. However, teams' problem-solving cultivate and intra - team relationship has been observed to require further improvement.*

*Key words: Kaizen, 5S, Kamban and Just-in-Time*

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## Acronyms

AOTS	Association of Overseas Technical Scholarship
APO	Asian Productivity Organization
CI	Continuous Improve
EKI	Ethiopian Kaizen Institute
JICA	Japan International Cooperation Agency.
JIT	Just in Time.
JPC	Japan Productivity Center
JUSE	Union of Japanese Scientists and Engineers
KF	Kaizen Facilitator
KPTL	Kaizen Production Team Leader
KSA	Knowledge, Skills and Attitude
ODA	Official Development Assistance
STS	Socio-technical Systems
QC	Quality Control
QCC	Quality Control Circle
TICAD	Tokyo International Conference for African Development
TPS	Toyota Production System
TQC	Total Quantity Control
TQM	Total Quality Management
WIP	Work in Progress
HVA	Handlers -Vereenging Amsterdam

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# CHAPTER ONE

## INTRODUCTION

The purpose of this chapter is to provide readers with an overview of the thesis topic and its approach. Although many readers may be eager to directly go to the findings before reading the first parts, the researcher recommends to anyone who has interest in reading the research to spend some time on Chapter One since it serves as the foundation for the rest of the thesis. The chapter deals with background of the study, definition of the terms and concepts, statement of the problem, basic questions of the study, objectives of the study, significance of the study, scope of the study, limitation of the study and organization of the study report.

### 1.1 Background of the Study

Today, we are without doubt, in the midst of the quality movement revolution and this phenomenon has been to affect every type of business, enterprise, organization and persons. (Goetsch and Davis, 2010,) have outlined that in any competitive marketplace, continuous cost reduction and quality improvement issues are essential if the organization is to stay in the operation. The emergence of new competitors in different industries from both local and international firms calls for continuous improvement in productivity and quality of products/services using considerable tools. Accordingly, a considerable number of organizations in Ethiopia have implemented, among other change tools, kaizen. Kaizen is a philosophy which has been originated in Japan.

Kaizen has been considered as a basis of Japan's competitive success (Imai, M., 1997). Accordingly, *kaizen* assistance is one of the standard menu items of Japanese industrial support in developing countries. While such assistance initially focused on East Asia where Japan had active business partnerships, it has now been implemented widely in other regions including South Asia, Latin America and Eastern Europe. However, as far as Sub-Saharan Africa is concerned, knowledge sharing and implementation of *kaizen* has been rather limited except in a

few notable cases. There are a lot of unexploited benefits of selective and well calibrated application of *kaizen* from which African countries can draw upon to improve their production and service units. (GRIPS Development Forum, 2009).

In the case of Ethiopia, though some private companies have started to implement kaizen previously, most companies have begun the kaizen events as of the beginning of the National Movement for Quality and Productivity Improvement (*Kaizen*), based on the Ethiopia-Japan Industrial Policy Dialogue (2009-2011). It is believed that considerable improvements have been observed in Ethiopian organizations which have implemented kaizen. As some individuals who work for organizations which have implemented kaizen informally say, it is one of the tools that have enabled their organizations to attain considerable positive changes in different attributes (working practice, workforce attitude, productivity, etc). Furthermore, several people have been heard to give explanations on different media about what benefits organizations have obtained using kaizen.

However, this has to be justified by such researches as this one so that the government as well as company executives get a confidence in using kaizen as a change tool. The researcher has been a graduate MBA student of St. Mary University, School of Graduate Studies and it has been an opportunity to choose to study the effectiveness of kaizen at this specific point in time, where sufficient information is required for further decisions to be made by organizations.

The researcher has, therefore, selected Wonji Sugar Factory, which started to implement Kaizen as of 2009 (Ministry of Industry, 2011) in order to study the steps it has used, the improvement results that it has achieved, the challenges that it has encountered and the lessons learned for other organizations and/or other researchers to either decide to implement kaizen or advise others to do so. Therefore, the output of this research has been two-fold: i) organizations which have not started to use kaizen as a change tool to bring about improvements or those which have started its implementation and stuck in the process will learn the lessons and continue to implement it in a more organized manner; ii) other researchers will use the output of this one to undertake further studies; for example, how to mitigate challenges identified in this study. It also

opens the eyes of other researchers to further develop the kaizen knowledge in order to accurately adapt it in developing world, in general, and in Ethiopia, in particular.

This is, therefore, a research paper carried out on kaizen implementation and its effectiveness in the above-mentioned organization. The paper undertakes data presentation, analysis and interpretation based on the responses of the sample respondents. Accordingly, it draws conclusions and recommends the change tool for other organizations to apply it, if the hypothesis becomes true. Moreover, the output of this research is meant to be applied by different professionals both for academic and practical advice in Ethiopian context.

## 1.2 Definition of Terms and Concepts

The following terms and concepts are applied in the context indicated.

**Kaizen:-** "(改善), Japanese for "good change". Philosophy of ongoing improvement: a Japanese business philosophy advocating the need for continuous improvement in somebody's personal and professional life". (Thessaloniki, 2006)

**5S –** "...is a philosophy and checklist for good housekeeping to achieve greater order, efficiency and discipline in the workplace." (Imai, M., (1986, 1997) and GRIPS Development Forum (2009))

**Quality Control Circle (QCC) –** "...is a small group of workers who collectively find a problem, discuss alternative remedies, and propose a solution." (Imai (1986, 1997) and GRIPS Development Forum (2009))

**Total Quality Management (TQM) –** TQM represents a number of management practices, philosophies and methods to improve the way an organization does business, makes its products, and interacts with its employees and customers. (Imai, M. (1986, 1997) and GRIPS Development Forum (2009))

**Toyota Production System (TPS) –** TPS is the philosophy which organizes manufacturing and logistics at Toyota, including interaction with suppliers and customers. (Imai, M. (1986, 1997) and GRIPS Development Forum (2009))

***Just in Time (JIT)*** – "...is a part of TPS and is a production system aimed at eliminating non-value adding activities of all kinds and achieving a lean production system flexible enough to accommodate fluctuations in customer orders". (Imai (1986, 1997) and GRIPS Development Forum (2009))

***Kamban*** – *Kamban* refers to a communication tool in the JIT production and inventory control system, developed at Toyota. (Imai (1986, 1997) and GRIPS Development Forum (2009))

### **1.3 Statement of the Problem**

Nowadays, organizations have been forced to live in a highly competitive environment – both global and local. It may be too difficult for any organization to survive these intense competitions with ‘business-as-usual’ way of doing things; rather they are required to look for several change tools that may, when applied, enable them to effectively and successfully compete. Equally well, in order to ensure economical utilization of the scarce resource that is available for any organization, it is inevitable that it has to change the way it has been doing business.

Among the many change tools available worldwide is *kaizen*, which has been originated in Japan and applied by many countries. In Ethiopia some organizations launched implementation of *kaizen* in 2009 with the assumption that it would have considerable improvement in performance. Though only a few sample organizations were selected in order to see their effectiveness and later expand the experience to other organizations, it is true that little has been done to find out the result of implementation of *kaizen* in these organizations. As a result, it may, at this stage, be quite difficult to confidently recommend this change tool for other organizations and suggest ways of addressing the challenges that the organizations encounter in the process of implementation.

Therefore, the result of this research enables the users to determine how effective *kaizen* has been for Wonji Sugar Factory; what learning points can be drawn for other organizations and be

a solution for the dilemma of whether to make use of kaizen as a change tool in Ethiopian companies.

Generally, kaizen's effectiveness is continuous improvement of productivity and quality, based on a participatory process involving the entire workforce. (GRIPS Development Forum, October 2009)

In particular, the following can be sighted as determining factors of effectiveness:

- Improving technical systems outcomes which result in positive achievements in various aspects;
- Increasing efficiency in cost, time and resource utilization;
- Humanizing employees and management relations;
- Enhancing employees satisfaction with their jobs ;
- Reducing waste in business processes;
- Improving working environments/ climate;
- Improving employees and management work commitment;
- Developing a culture of working as a team.

Thus, the research tries to find out whether these factors have been taken into consideration, what outcome results the Factory has gained and what challenges it has encountered through the process and has identified the lessons that can be drawn for other organizations to learn.

## **1.4 Research Questions**

This research has been carried out on Wonji Sugar Factory in order to find out the effectiveness of kaizen implementation. In light of the above problem statement the study provides possible solutions to the following basic research questions:

- 1.4.1. To what extent is implementation of kaizen linked with the Factory strategic objectives?



- 1.4.2 What improvements in employees' work behavior have been resulted in the process of kaizen implementation?
- 1.4.3 What technical system (hard aspect) outcomes are achieved through the implementation of kaizen within the Factory?
- 1.4.4 How does the implementation of Kaizen support the improvement of working environment?
- 1.4.5 What significant relationship does effective implementation of Kaizen have with the organization's productivity?
- 1.4.6 What social system (soft aspect) outcomes, in terms of positive changes in employee ability aligned with continuous improvement, are achieved through implementation of Kaizen?

## **1.5 Objective of the Research**

### **1.5.1 General Objective**

The general objective of this research was to critically assess the effectiveness of kaizen in Wonji Sugar Factory and identify the lessons learnt for any organization intending to use kaizen as a change tool.

### **1.5.2 Specific Objectives**

Specifically, the research has the following objectives:

- To find out if implementation of kaizen is linked with the strategic objectives of the Factory, especially, in terms of cost reduction and utilization of time and other resources;
- To identify the effectiveness of kaizen implementation in the Factory on such attributes as improvements in employees' behavior and working environment;
- To discover the technical outcomes (soft aspects) that are achieved by the Factory as a result of implementation of kaizen;

- To verify if kaizen implementation supports improvement of working environment;
- To examine the relationship that effective implementation of kaizen has with productivity improvement
- To ascertain the social outcomes that are achieved by the factory as a result of implementation of kaizen.

## **1.6 Significance of the Research**

The result of this research can be applied by the Factory under study to realize its achievements, lessons drawn and ways of keeping up the improvement wheel to go forward on a continuous basis. Equally well, other organizations and individuals can apply the outcome of this research to adapt the process. In particular, the following significances may be sighted:

- It can be taken as an opportunity for the factory to get feedback (through recommendations) on its kaizen implementation process for further improvements;
- It can be applied by the government to make informed decision on whether to support or not to support kaizen approach in changing the industries;
- Those organizations which have started to implement Kaizen can use the research findings to improve their means of executing the change tool;
- Students who want to carry out a research in the area can apply the results for reference;
- It gives confidence to other organizations for the implementation of kaizen in their processes.

## **1.7 Scope of the Research**

Though quite a number of organizations are known to have implemented or have started to implement kaizen, the researcher has decided to study only one organization – Wonji Sugar Factory which, the researcher believes, can reflect the cases of other organizations in similar socio-cultural environment. Furthermore, though various methods can be used in kaizen

implementation, the researcher has chosen the 5s model due to the fact that it was the model in use in most implementing organizations, in general, and the factory under study, in particular.

## **1.8 Limitation of the study**

Though maximum efforts have been made to successfully undertake the research, the following limitations have affected the as-scheduled completion and/or quality of the research:

- Time constraints which include the time taken to collect data from different respondents with different responsibilities and background.
- Shortage of reference materials especially, similar studies in Africa, in general, and in Ethiopia, in particular,
- Incompleteness of responses due to unavailability of recorded data, as required.

## **1.9 Organization of the Research**

This research report consists of five chapters. The first chapter deals with background of the research, statement of the problem, research questions, research objectives, significance of the research, scope and limitations of the research; the second chapter points out the literature review; Chapter three states the methodology used in the study, including research design, sample size and sampling techniques, data source and collection method, procedure of data collection and method of data analysis. The Fourth chapter discusses about data analysis and discussion of results. The fifth chapter, which is the closing chapter, focuses on the research summary, conclusions and recommendations.

## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

The study on effectiveness of kaizen calls for such pieces of information as overall description of the organization under study, definitions and concepts regarding kaizen, the overall aim and ultimate goals and its components. Accordingly, this chapter tries to review the related literature written on kaizen and its effectiveness. It specifically discusses the overview of Wonji Sugar Factory, definition and principles of kaizen, the three kaizen pillars, kaizen and other change (improvement) tools, conditions for successful implementation of kaizen strategy, kaizen in Africa and kaizen in Ethiopia.

#### 2.1 Over view of Wonji Sugar Factory

Wonji Sugar Factory is as old as more than half a century. This is confirmed by the following article by *Asayehegn Desta (2013)* as "After taking over the lands of the Nomads in 1951, the Ethiopian Government granted a concession of 5,000 hectares in Wonji in the upper reaches of Awash Ethiopia, 100 km Southeast of Addis Ababa, to a Dutch Company known as HVA for the establishment of a sugar estate and white sugar production. As the demand for sugar increased in Ethiopia, the Wonji Estate expanded to include an additional 1,600 hectares of land from Shoa, about seven km from Wonji. The Wonji Sugar Company then started sugar production in 1962."

"At the formal inauguration of the Wonji/Shoa Factory on November 10, 1962, the late King Haile Selassie described magnanimously this first large-scale commercial investment in Ethiopia that could very well make Ethiopia self-sufficient in sugar production, as well as creating an Ethiopian export market for sugar products to its neighboring countries. In addition, Emperor Haile Sellassie further claimed that with the crushing capacity of 1600 tons of cane per day (TCD), the establishment of this industry would become vital to the development of the nation with improvement of the standard of living of its people. It must be noted that though the sugar project started as a joint venture between the Dutch (HVA) firm and the Ethiopian government, the HVA owned about 90 percent of the sugar plantation and sugar factory while Ethiopia owned

only 10 percent. In addition, in its operation of the sugar factory, HVA remitted 10 percent of the invested capital and 15 percent of the annual profits to its headquarters. With the change of government in 1974, under Proclamation No.31 of 1975, all the sugar factories in Ethiopia became nationalized and centrally administered under Ethiopian Sugar Corporation."

"Finally, in 1991, the sugar corporation was dissolved by law and all existing factories were reestablished as public enterprises to be run by the Ethiopian Sugar Development Agency starting in 1992." Together with other sugar factories, Wonji sugar factory was reestablished as a public enterprise in the year 1992 and was organized under the Ethiopian Sugar Development Agency which was established in 1991 replacing the dissolved sugar corporation. According to the article stated above, Wonji Sugar Factory reorganized under the Ethiopian Sugar Corporation in 2010.

The Japanese philosophy, Kaizen, has been instructed by the Sugar Corporation by the Sugar factories including Wonji Sugar Factory. (Ethiopian Ministry of Industry, 2011)

## **2.2 Definition and Principle of Kaizen**

According to several authors Kaizen is a Japanese word which comes from two words: Kai (Change) and Zen (Good). So, it is 'change' for good (better) or simply improvement. (*Mariusz Bednarek and Justyna Sciborek, 2011*) and *Imran Ahmed Khan et al., 2011, Kaizen Institute, 2007*). *Imran Ahmed Khan et al.* in their article on the International Journal of Business & Management Research, indicate that Kaizen is translated from Japanese as "Kai (continuous) and zen (improvement)" which together becomes "continuous improvement". It is according to the same authors, different from other continuous "improvement processes" in that it (Kaizen) is action-oriented. That is, Kaizen teams are responsible for developing as well as implementing solutions to problems. (*Imran Khan et al, 2011*). According to *Imai (1986)*, Kaizen is defined as a continuous improvement that involved employees at all levels of an organization.

As *Assayehegn Desta (2012)*, who takes Brunet and New (2003) as a reference, indicates the three characteristics of Kaizen: "Continuous nature that is never - ending journey for quality and

efficiency; Usually incremental in nature, always improving instead of reorganizing or reinstalling; and Participative, requiring workforce involvement and intelligence."

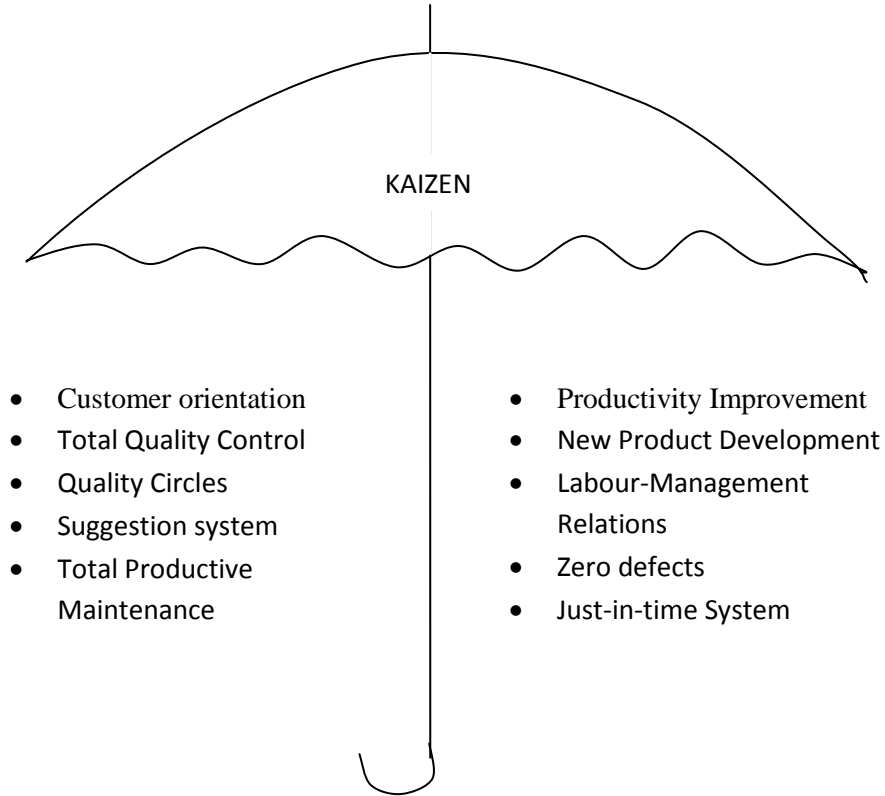
*Ethiopia Kaizen Manual* (2011) defines Kaizen as: "Kaizen is a process of continual understanding by an organization to improve its business activities and processes with the goal to always improve quality of products and services so that the organization can meet full customer satisfaction." (*Ministry of Industry, Kaizen Project/Japan International Cooperation Agenda, Ethiopia, 2011*)

Therefore, for organizations to improve their business activities and attain improved quality or products and services and ultimately customer satisfaction, it is required that employees at all levels should be engaged with full commitment and that the management should also be involved.

In order for the organization to achieve customer satisfaction and organizational success, it should give emphases to such areas as quality, cost and delivery time. By so doing the organization can ensure productivity and profitability, which are among measures of business key success factors. *Robert M. Grant (1995)*.

Kaizen as continuous or on-going improvement is required in all activities of an organization such as productivity improvement. *Production and Operations Management, S.N. Chary (2012)*.

According to authors in the area, all activities that directly or indirectly involve improvement in productivity come under the Kaizen umbrella . [(*Masaaki Imai (1986)*, and *GRIPS Development Forum, (2009)*, *S.N. Chary (2012)*].



**Figure 2.1 The Kaizen Umbrella**

**Source:** (*Masaaki Imai, 1986*)

As indicated in Figure 2.1, a large number of related and often overlapping constituents are included in the Kaizen tool kit (Kaizen Umbrella) . Some of these are 5S, Total Quality Management (TQM), Zero defects Productivity improvement, Toyota Products System (TPS) and Kanban system.

Kaizen is implemented under some guiding principles. Though different authors indicate different but, more or less, similar kaizen principles, the Ethiopian Kaizen Manual Summarizes Kaizen principles into five as follow:

1. Integrated total company approach: It requires the cooperative involvement of management at all levels and employees at the shop floor.
2. Proactive and spontaneous participation of employees of front-line workplaces with their own initiatives.
3. Focus on the work place that encourages improvements of efficiency in existing resources allowing low cost improvements to accumulate for significant contribution to the company goals.
4. Continuous and endless activities in revolving cycles of PDCA (Plan - Do - Check - Act) resulting in significant improvements.
5. Endogenous undertaking conducive to change in organizational culture: Practicing

**Figure 2.2:** *Kaizen's Guiding Principles [Summarized]*

**Source:** *Ethiopia, Kaizen Manual, Ministry of Industry 2012.*

According to *Thessaloniki (2006)*, "the essence of Kaizen is that people that perform a certain task are the most knowledgeable about that task". This very notion helps to capitalize the requirement that implementation of kaizen involves employees at all levels.

Moreover, involvement of individuals at all levels brings about more results when they are organized as teams. This idea is supported by *Thessaloniki (2006)* as "... the team effort encourages innovation and change and, by involving all layers of employees, the imaginary walls disappear to make room for productive improvement."

This means that every member of the organization contributes to the improvements of his/her organization and is eager to see the results.

Furthermore, everybody is adapted to change since the Kaizen Philosophy assumes that "our way of life - be it our working life, our social life, or our home life - deserves to be constantly improved". *Masaaki Imai, 1986: Kaizen Self-Training Booklet.*

The type of improvement according to several authors depends on the level in organizational hierarchies of the individuals contributing to the improvement. Thus, top management is more

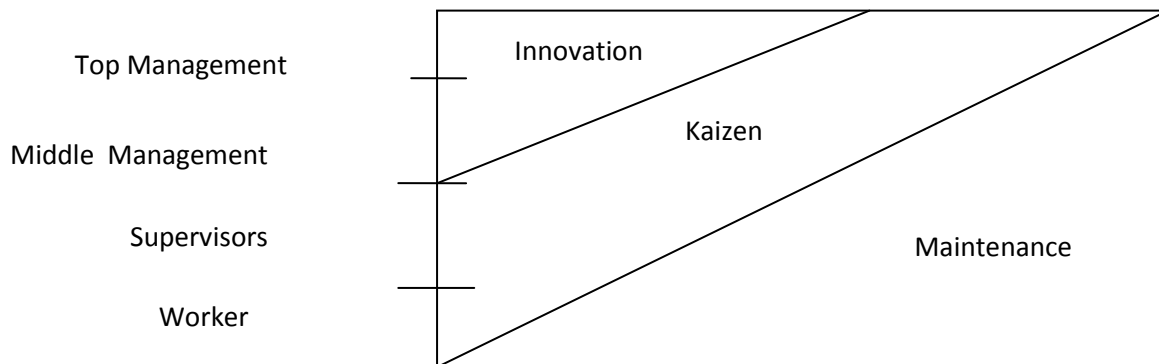


near to changing (improving) standards as this requires investment on innovations which in turn requires higher decision making of maintenance of these standards to be ensured through the involvement of top management, middle management, supervisors and workers. (*Imai, 1986, Thessalonki, 2006*).

Especially, Japanese management perception of Kaizen is that management introduces kaizen as a corporate strategy, middle management applies kaizen practices to improve functional capabilities and helps employees develop proper skills for problem solving (maintenance). *Thessaloniki (2006)* also indicates as "supervisors improve communication with the workers, formulate plans for kaizen and provide guidance to workers."

According to *Imai (1986)*, the higher up the manager is, the more he/she is concerned with improvement which is usually considerable (innovation). The standard improved through innovation is kept up through Kaizen.

The illustration shown in Figures 2.3 explains the application of Kaizen at different levels of management and workers.



**Figure 2.3: Japanese Perception of Job Functions.**

**Source: Masaaki Imai, 1986.**

It is also worth taking Imai's hierarchy of Kaizen involvement detailed for each player as follows.

<b>Top Management</b>	<b>Middle Management</b>	<b>Supervisors</b>	<b>Workers</b>
<ul style="list-style-type: none"> <li>• Be determined to introduce kaizen as a corporate strategy;</li> <li>• Provide support and direct for kaizen by allocating resources;</li> <li>• Establish policy for kaizen and cross-functional goals.</li> <li>• Realize kaizen goals through policy deployment audits;</li> <li>• Build systems, procedures and structures.</li> </ul>	<ul style="list-style-type: none"> <li>• Deploy and implement kaizen goals as directed by top management through policy deployment and cross-functional management;</li> <li>• Use kaizen in functional capabilities</li> <li>• Establish, maintain and upgrade standards;</li> <li>• Make employees kaizen conscious through intensive training programs;</li> <li>• Help employees develop skills and tools for problem-solving.</li> </ul>	<ul style="list-style-type: none"> <li>• Use kaizen in functional roles;</li> <li>• Formulate plans for kaizen and provide guidance to workers;</li> <li>• Improve communication with workers and sustain high morale;</li> <li>• Support small-group activities (such as quality circles) and the individual suggestion system;</li> <li>• Introduce discipline in the workshop;</li> <li>• Provide kaizen suggestions.</li> </ul>	<ul style="list-style-type: none"> <li>• Engage in kaizen through suggestion system and small-group activities;</li> <li>• Practice discipline in the workshop;</li> <li>• Engage in continuous self-development to become better problem-solver;</li> <li>• Enhance skills and job-performance expertise with cross-education.</li> </ul>

**Figure 2.4: Hierarchies of kaizen involvement**

**Source:** M. Imai, 1986

All in all Kaizen is everybody's business in the organization.

## 2.3 The Three Pillars of Kaizen

*Thessalonki (2006)* refers to *M. Imai (1986)*, often known as the father of Kaizen philosophy and practice, to summarize the three pillars of Kaizen as house-keeping, waste elimination and standardization.

These can be elaborated based on *Thessalonki's article: "Kaizen Definition and Principles in Brief, 2006"* as follows:

### 2.3.1 Housekeeping

Among the activities performed to improve the "workplace, known as 'Gemba'" in Japanese, is housekeeping.

The 5S is an ideal methodology applied in housekeeping. The components of 5S emanate from the first alphabets of the Japanese words: Seiri, Seiton, Seiso, Seiketsu and Shitazuke. As for the English equivalent of these words, different authors translate them slightly differently. Thus, according to *Thessaloniki*, these words can be translated as "sort, straighten, sweep, sanitize and sustain" respectively. *Ryan Smith and Joe Tate (2011)* in their Article on "Kaizen: A Guide to Continuous Process Improvement", suggest the English equivalent words to be "Sort, Straiten, Scrub, Systematic and Sustain". Though other authors have still a bit different suggestions they all emphasize workplace cleanliness.

Each of the 5S components may be described as follows:

**Table 2.1 5S Activities**

No.	List of 5S	Activities	Remark
1	Seiri	SORT what is not needed. Use the red tag system of tagging items considered not needed, then give everyone a chance to indicate if the items really are needed. Any red tagged item for which no one identifies a need is eliminated (sell to employee, sell to scrap dealer,	

		give away, put into trash.	
2	Seiton	STRAIGHTEN what must be kept. Make things visible. Put tools on peg board and outline the tool so its location can be readily identified. Apply the saying "a place for everything, and everything a place"	
3	Seiso	SCRUB everything that remains. Clean and paint to provide a pleasing appearance.	
4	Seiketsu	SPREAD the clean/check routine. When others see the improvements in the Kaizen area, give them the training and the time to improve their work area.	
5	Shitsuke	STANDARDIZATION and self-discipline. Established a cleaning schedule. Use downtime to clean and straighten area.	

**Source:** *Thessaloniki (2006), "Kaizen Definition & Principles in Brief Concept & Tool for Employees' Involvement."*

The 5S approach is, thus, a step-by-step method which is responsible for identifying items not needed (idle machines, parts not needed, etc.) eliminate these, arrange the rest in order, schedule and carry out cleaning of the workplace and keep on the improvement action and make it your habit.

### 2.3.2 Waste (Muda) Elimination

The Japanese word "muda" means waste or any non-value-adding action. According to *Ethiopia Kaizen Manual (2011)*, the so-called "seven deadly wastes" are classified as: "Muda of overproduction, 'Muda' of inventory (Unnecessary stock), 'Muda' of waiting, 'Muda' in transportation, 'Muda' of defective items, 'Muda' of motion and 'Muda' in processing".

Therefore, a combination of these wastes, if they are not identified early and got rid of, will lead organizations to deterioration in performance and ultimately to lower profitability. Each waste has its own causes and results in negative outcomes.

*The Kaizen Manual (2011)* lists some of the outcomes and their causes. These can be summarized in the following table.

**Table 2.2 Workplace Wastes and their Outcomes and Causes**

Muda/Waste	Outcome	Causes
1. Overproduction	❖ Increase in inventory (tied-up capital) ❖ Deterioration of turnover	<ul style="list-style-type: none"> <li>• Big and fast machineries</li> <li>• Unnecessarily high number of workforce and facilities.</li> </ul>

	ratios of funds	
2. Inventory	❖ Waste of space ❖ Expansion of working capital needs	<ul style="list-style-type: none"> <li>● Weak in inventory control awareness</li> <li>● Anticipation production</li> <li>● Bottleneck process</li> </ul>
3. Waiting	❖ Waste of manpower, time and machines	<ul style="list-style-type: none"> <li>● Bad facility layout</li> <li>● Capacity imbalance</li> </ul>
4. Transportation	❖ Production deterioration ❖ Assurance of damage in transportation	<ul style="list-style-type: none"> <li>● Sedentary operation</li> <li>● Bad facility layout</li> <li>● Low morale</li> </ul>
5. Defect-making	❖ Increase in material cost ❖ Increase in production cost ❖ Deterioration of productivity	<ul style="list-style-type: none"> <li>● Poor methods and standards for inspection</li> <li>● Lack of standard operation</li> </ul>
6. Motion	❖ Unstable operation ❖ Unnecessary movement	<ul style="list-style-type: none"> <li>● Bad layout</li> <li>● Low skill</li> </ul>
7. Processing	❖ Lower work efficiency ❖ Increase in defects	<ul style="list-style-type: none"> <li>● Lack of proper process design</li> <li>● Insufficient standardization</li> </ul>

*Adapted from: Kaizen Manual 2011, Ministry of Industry [Ethiopia]*

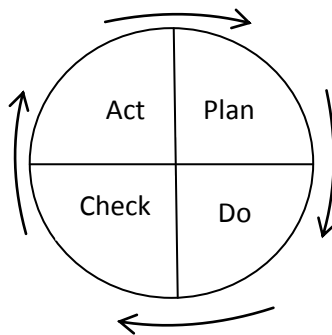
It is therefore very crucial for organizations to eliminate these mudas/wastes in order to ensure that the negative outcomes indicated above will unlikely happen.

### **2.3.3 Standardization**

Where there are no standards, no improvement can be realized. Standards are set and the performance of machines, employees or processes are measured against these standards. Standardization is one of the most important pillars of Kaizen. It is also "one important pillar of TQM". (M. Imai, 1986). "Standards require constant revision, and upgrading". By frequently reviewing standards and taking actions organizations can attain dramatic improvements. Thessaalonki (2006). This involves data collection, data analysis and encouraging teams to carry out problem - solving tasks. For organizations to survive competition by providing quality products/services, standardization is one of the most important activities to consider. As S.N. Chary (2012) clearly puts in his book 'Production and Operations Management'; "quality in products/services comes through: physical standards – quantifiable standards; system standards – methodology - oriented; behavioral standards – way of interacting and philosophical standards – ways of thinking or attitudinal and motivational aspects".

*J.K. Liker (2004)* in his book "The Toyota Way" takes *M. Imai's* explanations of standardization as "It is impossible to improve any process until it is standardized?" He also suggests as "one must standardize, and thus stabilize the process, before, continuous improvements can be made." That is, adaptation to the standard is required before trying to improve the standard.

This can best be illustrated by using Deming's PDCA cycle (Plan - do - check - Act) which can help in adapting the standard (stabilize).



**Figure 2.5:** *Deming's PDCA Cycle*

*Source: Chary, S.N., 2012*

Accordingly, the PDCA cycle of continuous improvement can be described as follows: "*Plan*: identify what to improve and develop future actions to undertake based on opportunities of improvements and internal assessments; *do*: carry out the plan; *check*: evaluate the result against the plan and finally, *act*: adjust the process (plan, do and act) as required." *D.L. Goetsch and S.B. Davis (2000)*

In the process, it can then enable the organization or work units to see the opportunities of improving the standards.

## **2.4 Kaizen and Other Change (Improvement) Tools**

In order to bring about positive changes (improvement) to an organization, a number of approaches are in use. Some of these approaches/tools bring about large improvements at one time whereas others can only end in small improvements but continuously. This does not mean

that organizations should always choose this or that; but they can make use of both at different times in such a way that they supplement each other. Some of these tools are discussed as compared to Kaizen as follows.

#### **2.4.1 Kaizen Versus TQM**

"Total Quality Management (TQM) is an approach to quality management that emphasizes a thorough understanding by all members of an organization..." *John E. Bawer et al (2002) P. 1120*. Depending on the emphasis exerted by different authors TQM and Kaizen incorporate each other. For example *D.L. Goetsch and S.B. Davis (2000)* state Kaizen to be part of a continuous improvement approach, which in turn belongs to TQM. On the other hand, as stated under the "Kaizen Umbrella" TQM is considered as a component of Kaizen approach. Whichever way we consider the relationship between Kaizen and TQM, they can be taken as the two faces of one coin in terms of continuous improvement that involves employees.

#### **2.4.2 Kaizen Versus Benchmarking**

According to *John E. Bawer (2002)*, benchmarking is "a technique of evaluation in which an organization compares itself with other organizations". We can have competitive (comparing own organization with competitors), process (comparing work processes), performance (based on the selected factors) or strategic benchmarking.

Since benchmarking incorporates a wider range of areas in terms of externally comparing an organization's selected factors with that of other organizations and internally the organization's work units with each other, it can be considered as supplementary to Kaizen. According to *Ethiopia Kaizen Manual (2011)*, "Benchmarking method in the form of collaborative Benchmarking may have many application possibilities in the dissemination of Kaizen". This can, of course, speed up the improvement process.

#### **2.4.3 Kaizen Versus Business Process Reengineering (BPR)**

Business Process Reengineering (BPR) has received much attention by different companies worldwide.

BPR has been defined by different people in slightly different ways. According to *Hammer and Champy (1998)*, as quoted by *Anderson, Bjøor (1999)*, BPR is

*"Reengineering is fundamental rethinking and radical redesign of business process to achieve dramatic improvements in critical contemporary measures of performance, such as cost, quality, service and speed."*

One philosophy of both Kaizen and BPR may be that both aim at improvement. But BPR aims at dramatic improvement at a time whereas Kaizen has the objective to ensure incremental improvement. Therefore, one can think of applying BPR to gain drastic improvement and then use Kaizen to keep on the improvement at a constant pace. Moreover, as indicated in *Ethiopia Kaizen Manual (2011)*, in the process of Kaizen implementation one can identify the need for fundamental improvement (BPR) in which case they can supplement each other.

## **2.5 Conditions for Successful Implementation of Kaizen Strategy**

The *Ethiopia Kaizen Manual (2011)* states some of the precondition of effective Kaizen implementation in any organization or a given company. According to the manual, *knowledge* of KAIZEN concept and KAIZEN technology, *attitude* with positive thinking, Involvement or participation from top management to workers, *Zealous* support for KAIZEN, Education on KAIZEN and KAIZEN technology and *believing* never-ending KAIZEN activity are basically important preconditions of effective and successful Kaizen implementation.

As pointed out in the 'Definitions and Principles of Kaizen' section, kaizen is a Japanese philosophy that encourages the continuous improvement of one's personal life and the ongoing efforts for improvement at work. For a small business, a Kaizen strategy is one that works to constantly improve the performance of employees and managers, the interaction between staff and management, and the pursuit of better productivity. Certain conditions need to be part of the corporate culture for a Kaizen strategy to take effect in your organization. *George, N. (2012)*, stated the following preconditions for the effective implementation of Kaizen in a given company.



**Job Satisfaction:** - For a Kaizen strategy to work, your employees must be satisfied with their jobs and be interested in working to continuously improve their performance. This implies that a survey should be undertaken to determine the staff attitudes toward job satisfaction and work to improve the workplace conditions until job satisfaction is achieved.

**Company Involvement:-** The company must be dedicated to a Kaizen strategy for it to work. Managers need to be encouraged to set time aside for employee evaluations, and employees need to allow time to monitor the managerial staff, as well.

**Dedication:** - Kaizen strategy should be presented to managers and employees as a way to improve company productivity and add to the corporate bottom line. A Kaizen strategy can look like a common-sense approach to job development, but its effectiveness is in the ability of the staff and managers to stay dedicated to it.

**Open-Minded:** - the management and staff need to have an open mind for a Kaizen strategy to work. It can be a significant departure from the way the organization is used to doing things.

**Questioning:** - A Kaizen strategy requires a lot of questions to be asked about individual and group performance. Thus, the staff should be encouraged to raise a lot of questions about why they did something in a particular way, what results they were hoping for and how they judge the results they achieved. Let the staff be aware that these questions are not an indictment of their performance but rather a way to improve productivity.

**Teamwork:** - the staff should be encouraged to learn to work as a team and respect each other's opinions and input for Kaizen to be effective.

**No Finger Pointing:** - When something goes wrong, it is common people choose finger-pointing at others as a defense mechanism. It is very important to create a culture where mistakes are considered as opportunities to learn and improve as opposed to being reasons for accusations.

**Figure 2.6:** Preconditions for the Effective Implementation

**Source:** *George, N. (2012)*

## **2.6 KAIZEN in Africa: Towards Industrial Development**

The beginning of Kaizen in Africa has been effected through JICA. According to its Report of 2012 "Kaizen has spread among Japanese companies in Japan and abroad. JICA has also offered assistance for KAIZEN to many developing countries in Asia, Latin America and Eastern Europe and now in Africa!" *JICA-ACET (2012)*. As indicated in the report, the first JICA project was extended to Singapore, from 1983 to 1990, for productivity management and it was very successful. Building on the success of this cooperative effort, the report states: "the Singapore Productivity and Standard Board has subsequently grown to become a major organization with external training programs in other countries and regions, including the Southern African Development Community (SADC) under partnership arrangements with JICA".

"Projects are implemented in Ghana, Tunisia, Ethiopia, Kenya, Zambia, and Morocco; and there are several nationals that officially requested for the Project". In addition to the individual countries, "African Union Commission is requesting JICA for assistance on Kaizen and different countries like Rwanda, Zambia, Botswana, Mozambique, South Africa and Uganda have participated in the MPC course". *Homma, T., (2011)*.

## **2.7 Kaizen in Ethiopia**

According to *Asayahegn Desta (2012)*, "Ethiopia is one of the 7 African nations that started to implement the kaizen philosophy. It becomes the leading nation in Africa through successful kaizen implementation, organizing an independent institute under the Ministry of Industry which is called Ethiopian Kaizen Institute. The institute has been providing support and counseling service for the successful kaizen implementation in the county's industry sector, (JICA 2013 report). Also strengthening this fact, Ethiopia is one of the star performers in a newly burgeoning Africa, having registered double-digit growth for the past eight years. The current five-year plan aims to double the gross domestic product between fiscal 2010–11 and 2014–15. But several issues need to be addressed before Ethiopia can achieve further growth in exports and investment. Private-sector development remains sluggish, and low levels of quality and productivity remain a problem." So, this shows that Ethiopia has given considerable emphasis on Kaizen implementation.

"It was the late Prime Minister Meles Zenawi who had the idea of adopting kaizen, a Japanese business philosophy meaning 'continuous improvement' that promotes quality and productivity improvement as well as human resource development. In response to a request from the prime minister, JICA launched a technical assistance project to introduce the kaizen concept to Ethiopia in 2009". (JICA 2013 report)

### **2.7.1 A Government Agency to Promote Kaizen**

According to JICA Report (2013), efforts to promote kaizen in Ethiopia received a major growth in 2011, when the Ethiopian Kaizen Institute (EKI) was established under the supervision of the Ministry of Industry. "Having been successfully applied in many countries in Asia, Eastern Europe, and Latin America, kaizen is no longer just a Japanese concept. Even so, Ethiopia is probably the first country in the world to name a government agency specifically for the concept. The establishment of the new agency reflects the strong example shown by Prime Minister Meles, who was one of the most influential opinion leaders in Africa." (*JICA 2013 report*) It is obvious that for any change/improvement to happen, the leadership should take the initiative. In the case of Ethiopia, the late Prime Minister has taken Kaizen as an ideal change tool and formed Ethiopian Kaizen Institute which was meant to support other organization in its implementation

## CHAPTER THREE

### RESEARCH DESIGN AND METHODOLOGY

This chapter outlines the methodology on how data and information relevant to the research were gathered and analyzed in order to achieve the objectives of the study. It discusses the description of study procedures and the methods employed in the study. Areas covered include the research design, sources of data, instruments of data collection, population and sampling procedures, methods of data analysis, and ethical consideration.

#### 3.1 Research Design

There are many definitions of research design; one definition that Kelliher (2005) uses is that —"research design is the blueprint for fulfilling research objectives and answering questions where it aids the researcher in the allocation of limited resources by posing crucial choices in the methodology". Other definitions are that research design is an activity- and time-based plan and a guide for selecting sources and types of information to obtain answers to research questions (Blumberg, et al. 2005).

Though it can be complicated in selecting an appropriate research design, Cooper and Schindler (2008) are of the view that, by creating a research design which uses a combination of methodologies, researchers can achieve greater insight than if they were to follow methods which used frequency or methods which have been mentioned the most in media.

This research has been conducted in a descriptive method of research called survey studies to assess clear understanding about existing trends of the kaizen implementation and its effectiveness in the factory under study. The descriptive research method helps to draw a valid general conclusion, and it is the most popular and widely used research method. This idea is strengthened by survey study is the most commonly used descriptive method in research.

### 3.2 Source of Data

The main sources of data for this research were both primary and secondary data.

- **Primary data:-** In relation to this, Trochim (2003:179) argues that alternative forms are designed to be equivalent to the types of questions ... that leads to the outcome. Likewise, Kothari (2006:266) describes that the collection of primary data is either through questionnaire or through interviews. Accordingly, for this study, the primary data have been collected directly from the sample respondents through the selected instruments discussed in the following sub-sections.
- **Secondary sources: -** Besides primary data, secondary data were obtained from different books, newspapers, magazines, academic papers, reports, etc. In addition to these, authentic and reliable online scholarly written literatures were used to supplement the information. To assess the effectiveness of the factory's kaizen implementation, the researcher has referred to the annual reports and compared the factory's productivity, the major of the factory's strategic objective, before and after kaizen in order to examine the improvement.

### 3.3 Instruments of Data Collection

The researcher collected data by administering a questionnaire and structured interview questions. The questionnaire used structured questions, divided into two parts. Part I consisted of the demographical background of respondents. Part II discusses about respondents' opinion on Kaizen Implementation based on key dimensions questions to answer the research questions. The structured interview questions were prepared for the researcher to collect the data through interview.

Most of the structured questions were the close-ended type and respondents were asked to mark the appropriate box matching the correct answer.

- **Interview:** - it is verbal form of data gathering instrument. "Interview is a form of verbal questioning and it is a principal means of data gathering. It is one of the most popular techniques in survey research" Robson, A, (1993). The research has used unstructured interviews to collect more detail information about the topic. The 2 Kaizen core teams and 5 Kaizen office experts were interviewed to gather first-hand

information regarding the effectiveness of kaizen implementation and its challenges in the factory.

- **Questionnaire:** - is a written question in the form of text (Sarantakos, 1993; Robson, A., 1993) defining it as “questionnaires are written question, which can be self-administered by the researcher or could be sent by mails. Information is offered by the respondent” The researcher used closed - ended questions prepared and presented for Kaizen facilitators and Kaizen product team leaders, since they are able to read and understand the questions and reply in rating form. This is believed to produce quick and consistent result.
- **Observation:-** the researcher conducted observation on factory production and production related departments’ general environment, the factory production store organization, main production and machine outline of the factory, the factory production records before and after kaizen implementation and other related issues implementation of different kaizen tools activities.
- **Document analysis:** - the factory’s production and improvement related documents of different years and final annual reports were analyzed.

### 3.4 Research Population and Sampling Procedures

Population refers to the group about whom the researcher wants to know more and from whom a sample will be drawn. This is often defined in terms of demography, geography, occasion time, etc.

Though the total number of employees in the factory is more than 3000, the target population taken for this study is 775.

- |                             |     |
|-----------------------------|-----|
| • Kaizen Team Leaders (KTL) | 581 |
| • Kaizen Facilitator (KF)   | 173 |
| • Kaizen Office Experts     | 15  |
| • Kaizen Core team members  | 6   |

775

The reason for taking this as a population for the study is that a) quite a number of the employees stated above are daily labourer whose team leaders are permanent employees, b) the

rest of the employees are organized in teams of at least 5 all of which have team leaders and each team has discussion hours. Therefore, taking team leaders as a target population is tantamount to taking the team members because the information obtained from the former can be taken as that which would be obtained from the latter.

According to L. R. Gay (2008) who suggests that "10% of large populations and 20% of small populations as minimums can be taken as sample size". However, the researcher has taken 30% of the target population in order to get more reliable data from different respondents.

Accordingly, 51 Kaizen Facilitators from all departments and 174 factory KPT leaders were selected through probability sampling called simple random sampling for involving in responding to questionnaires. In addition to this, 2 Kaizen core team members which are member of management and steering committee of the factory and 5 Kaizen office experts were taken as sample respondents for interview questions.

Furthermore, pertinent documents were included in this study to gather important and relevant information.

**Table 3.4.1: Total Population and Sample Size**

No	Types of Respondents Total	Population	Sample size (30%)	Set of Sampling Technique
1	Kaizen Core team members	6	2	Simple random sampling.
2	Kaizen Office Experts	15	5	Simple random sampling.
3	Kaizen Facilitators	173	51	Simple random sampling.
4	Kaizen Product Team Leaders	581	174	Simple random sampling.
	<b>Total</b>	<b>775</b>	<b>232</b>	

### 3.5 Method of Data analysis

Data analysis in descriptive methods research relates to the type of research strategy chosen for the procedures. For the analysis process, version SPSS.16.0 software was used to maintain the large database and is used for the descriptive data analysis. As indicated in the sampling strategy section, the data collected from different sources have been summarized, categorized and coded to suite for analysis. The qualitative or the open-ended questions have been summarized and presented as they are, while the closed-ended questions have been coded and analyzed using both

descriptive and inferential statistics by using ratio, percentages, frequencies, T-test and measure of central tendency and dispersion. The outputs of the data were presented appropriately depending on the respondents' response. Accordingly, the T-test was used to determine the level of significance of the difference in response of the respondents. The end result has been presented in a written form and in the form of table. Finally, presentation, analysis, and interpretation of data and conclusions and recommendations have been drawn using analysis and data outcomes into a text format.

**Table: 3.4.2 Summary tables for data and methods of analyzing**

No	Items of data	Method of analyzing	
		Tools	
1	Open ended interview for the main division heads	Description	These qualitative data were entertained qualitatively based on their frequency.
2	Close ended questionnaire of supervisor, section heads, Forman's and work forces.	Spss.16.0	Percentage, mean, Standard deviation, t-test, were treated quantitatively.
3	Open ended Questionnaire for cluster supervisors.	Description	These qualitative data were entertained qualitatively.
3	Observation check list of the factory kaizen related documents	Description	Here researcher observed the factory workshop, production machine out late and documents related to productivity and kaizen event activities.

### 3.6 Ethical Considerations

Research as a profession has its own ethics. Respecting all these very common and basic ethics of research (confidentiality, respect for intellectual property, carefulness, etc) are important for any types of researches. (*Nouria Brikci - Research Officer, MSF UK and Judith Green - Senior Lecturer in Sociology, Health Services, Research Unit, London School of Hygiene and Tropical Medicine*) These basic ethical principles have been considered for this research. Respecting the willingness of respondents to participate in the research or not keeping respondent response secretly, using the data that were gathered from the sampled participants only for the purpose of this study and getting permission to conduct this research in the factory were done by the researcher before conducting the research.



## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRETATION

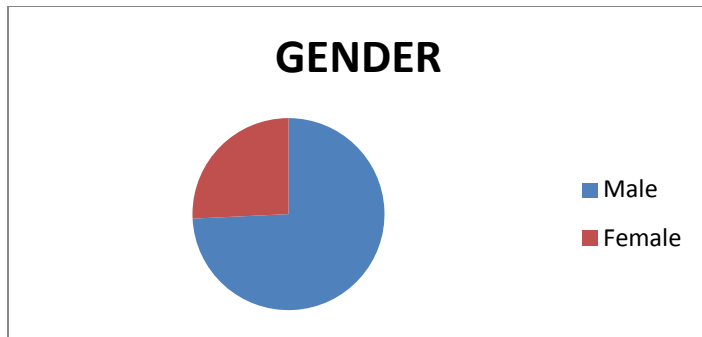
This chapter deals with the data presentation, analysis and interpretation of the responses of the factory Kaizen Steering Committee members, Kaizen Officers, Kaizen Facilitators and Kaizen Production Team Leaders collected through questionnaires. The data thus obtained were interpreted qualitatively and quantitatively in order to make the data more clear and expressive. In addition, the findings from data collected from Main Division heads through interviews were presented qualitatively. Similarly the collected data through observation based on the prepared checklists were discussed qualitatively in this chapter.

#### 4.1 Demographic Variables of the Respondents

Tables, charts and descriptive explanations have been employed to illustrate the demographic variables of the respondents such as gender, age, years of experience and educational background of the 232 respondents. These are presented in Tables 4.1.1 – 4.1.4 and Figures 4.1.1 – 4.1.4 in tabular and chart forms respectively.

**Table 4.1.1 Respondents' Gender**

Gender	Frequency	Percentage
Male	172	74.14%
Female	60	25.86%
Total	232	

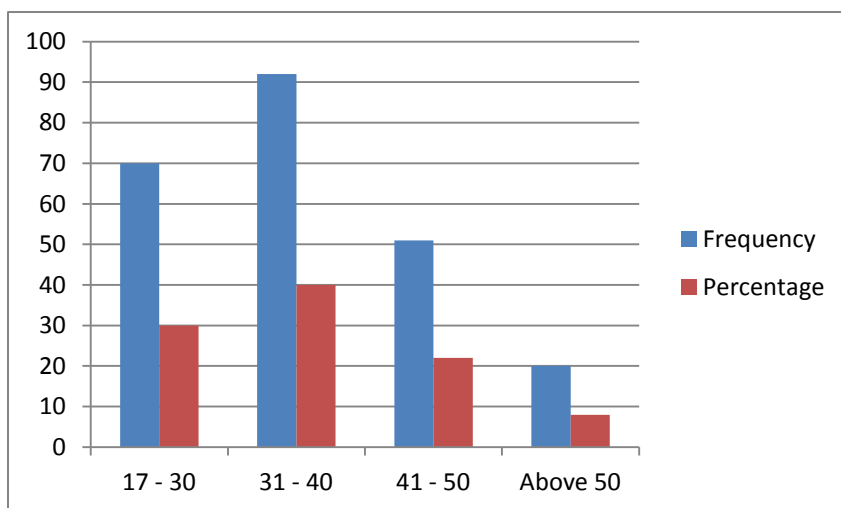


**Figure 4.1.1 Gender of Respondents**

Table 4.1.1 and Figure 4.1.1, indicate that 74.14% of the respondent of Wonji Sugar Factory staff were males and 25.86% of them were females. This is an indication of a slightly high male composition of the respondent staff of Wonji Sugar Factory.

**Table 4.1.2 Age group of the Respondents**

Age Group	Frequency	Percentage
18- 30	70	30
31 - 40	92	40
41 - 50	50	22
Above 50	20	8
Total	232	

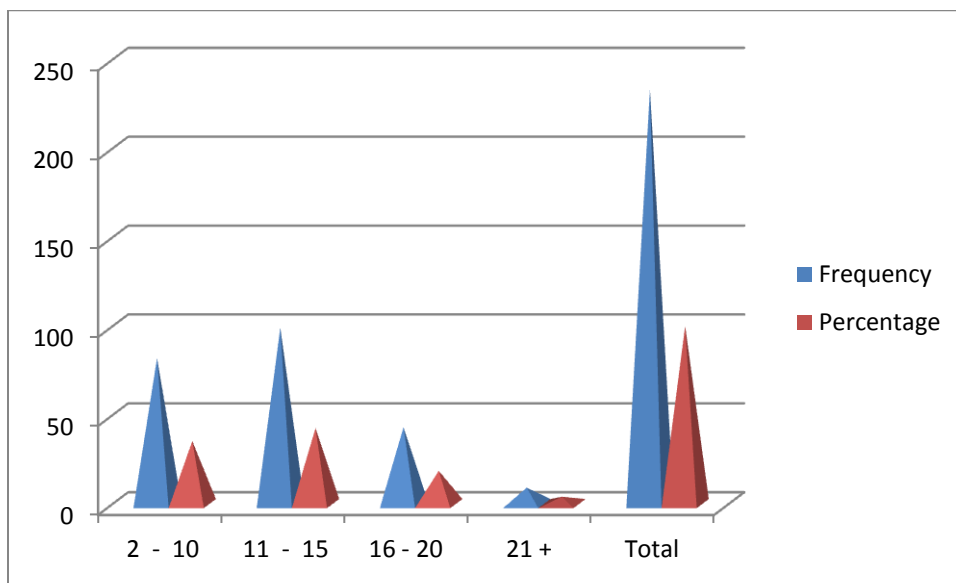


**Figure 4.1.2 Age group of the Respondents**

Table 4.1.2 and Figure 4.1.2 indicate that 30% of the staff respondents were in the age bracket of 18 - 30 years. 40% and 22% of the Respondents were in the age bracket of 31- 40 and 41 - 50, respectively, while 8% of the respondents were 50+.

**Table 4.1.3 Years of Service of the Respondents**

Year of Service	Frequency	Percentage
2 - 10	82	35.2
11 - 15	98	42.5
16 - 20	43	18.5
21 +	9	3.8
Total	232	100

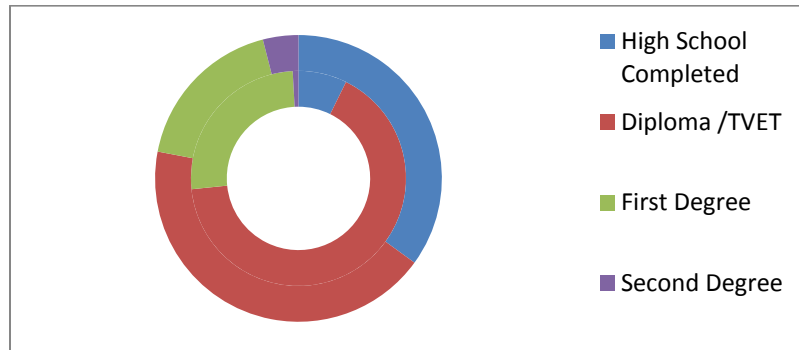


**Figure 4.1.3: Years of Service of the Respondents**

Table 4.1.3 and Figure 4.1.3 indicate that 42.5% of the respondents have served in the factory for 11 to 15 years, 35% of the respondents for 2 - 10 years. 18.5% of the respondents have served the factory for 16 - 20 years while 3.8 % have served the Factory for more than 21 years. The research revealed that none of the respondents the Factory were in the age bracket below two years.

**Table 4.1.4 Educational Background of Respondents**

Educational Background	Frequency	Percentage
High School Completed	17	7.3
Diploma /TVET	153	42
First Degree	60	18
Second Degree	2	4
Total	232	100



**Figure 4.4: Educational background of staff respondents**

Table 4.1.4 and figure 4.1.4 indicate that majority (42%) of the respondents were diploma/TVET holders, as the nature of the factory demanded technical personnel. 35% of them, however, are High school complete while 18% and 4% have first degree and second degree holders, respectively. None of the respondents were below High School complete.

## 4.2 Data Analysis and Interpretation

Out of the total number of the 232 staff selected for this research, 7 of them (2 Kaizen Core Team Member and 5 Kaizen Office Experts) were selected for providing answers to interview questions and all the rest (225) staff were selected to provide answers to the structured questionnaires.

Here, data analysis has been conducted based on the responses obtained from the questionnaires and the responses obtained from the interview as well as observation results were used as a supplementary for strengthening the data analysis and interpretations. **(Level of agreement:** [1.00-1.49] = highly disagree; [1.50-2.49] = disagree; [2.50-3.49] = undecided; [3.50 - 4.49] = agree; [4.50-5.00] = highly agree  $x$  = calculated mean across the cells with mean range =2.15  $t=1.960$  with  $df = 326$  at  $p < 0.05$ . *Mgr refers to Kaizen Facilitator (KF) and KPTL refers to*

*Kaizen Production Team Leaders.*) The following Tables give the responses obtained from the respondent staff.

**Table 4.2.1 Contributions of Kaizen Implementation to Technical Systems Outcomes and Efficiency**

No	Statements	Respondents	Level of Agreement						Mean	SD	T-test	Sig
			Rating scale									
			1	2	3	4	5	Total				
1.	Implementation of Kaizen helped the factory to achieve its strategic objectives.	KF	2	3	6	25	15	51	3.94	1.008	.658	.450
		KPTL	17	13	27	46	71	174	3.81	1.310		
2.	Implementation of Kaizen practice improved factory's systems from time to time?	KF	2	2	5	26	16	51	4.02	.969	.423	.077
		KPTL	10	15	23	53	73	174	3.94	1.191		
3.	Implementation of kaizen in the work unit resulted in cost reduction.	KF	2	6	6	24	13	51	3.78	1.083	.042	.963
		KPTL	18	13	22	58	63	174	3.78	1.295		
4.	Implementation of kaizen increased efficiency in terms of cycle time in the work unit.	KF	2	6	11	20	12	51	3.67	1.089	.145	.874
		KPTL	21	8	36	57	52	174	3.64	1.286		
5.	Implementation of kaizen resulted in wise resource utilization in the work unit	KF	4	9	3	23	12	51	3.59	1.252	.098	.922
		KPTL	19	11	37	66	41	174	3.57	1.228		
6.	Considerable waste reduction has been achieved.	KF	0	2	0	31	18	51	4.27	.666	3.933	.000
		KPTL	21	15	33	60	45	174	3.53	1.293		

Table 4.2.1 has mainly been prepared to check the outcomes regarding technical system's results in terms meeting strategic objectives and improving the Factory's systems and efficiency in terms of cost, cycle time and resource utilization.

On the basis of Table 4.2.1 item 1 (Implementation of Kaizen helped the factory to achieve its strategic objectives.): Regarding this item, the respondent sample Kaizen Facilitators' response mean is 3.94. The respondent KPT leaders mean responses of the same item is 3.81. Both respondents' responses mean scale of item 1 lies on the range of 'agree'. The t-value of this item is .658. Thus, the item is not significant statistically. (That is, there is no significant difference in the responses of the two respondent groups.) This means there is similar understanding and information between the factory Kaizen Facilitators' and KPT leader's respondent groups for the Kaizen significant contribution to achieve strategic objectives of the factory.

This clearly shows that implementation of Kaizen has highly helped Wonji Sugar factory to achieve its strategic objectives.

On the basis of Table 4.2.1 item 2 (Implementation of Kaizen practice improved factory's systems from time to time) the respondent sample factory Kaizen Facilitators group's response mean for item 2 is 4.02. The sample respondent KPT leaders mean responses of the same item is 3.94. Both sample respondent scale of the item lie on the range of "agree". The t-value of this same item 2 is .423. Thus, the item is not significant statistically. This discloses that there is also similar information and understanding between both the factory Kaizen Facilitators groups and KPT leaders.

These indicate that the implementation of Kaizen increased the practice of Kaizen improving the Factory's systems from time to time.

On the basis of Table 4.2.1 item 3, 4 and 5 (Implementation of kaizen in the work unit resulted in cost reduction, Implementation of kaizen increased efficiency in the work unit work process and implementation of kaizen resulted wise resource utilization in the work unit respectively). The respondent sample Kaizen Facilitators' response mean for items 3, 4 and 5 are 3.78, 3.67 and 3.59, respectively. The sample respondent KPT leaders mean responses of items 3, 4 and 5 are also 3.78, 3.64 and 3.57, respectively. Both sample respondent group's response scale of all item lie on the range of "agree". The t-values of the same items 3, 4 and 5 are .042, .145 and .098, respectively. Thus, the items are not significant statistically. This shows that both sample respondents have common understanding regarding implementation of Kaizen and its positive contribution to minimizing production costs, time and resource.

This and the information obtained during field visit indicate that implementation of Kaizen in the factory has minimized production costs, encouraged wise resource utilization in the factory and increased efficiency in majority of the work units in the factory through enhancing their understanding about waste, implementation of 7 mudas, 5Ss' and avoiding non value added activities instead of focusing on the net production activities,

On the basis of table 4.2.1 item 6 (Considerable wastes are reduced as a result of kaizen implementation.) the respondent sample factory managerial group's response mean for item 6 is 4.27. The sample managerial respondent of the item response scale lies on the range of "agree".

The sample respondent KPT leaders mean responses of the same item is 3.53 and the sample respondent scale of the item similarly lies on the range of “agree”. The t-value of item 6 is 3.933. Thus the item is significant statistically. This clearly indicates that there is different information and understanding about the implementation of kaizen contribution to minimize considerable wastes in the production system of the factory between the respondent sample Kaizen Facilitators and KTP leaders.

Thus, even though the the above analysis indicate that there is difference in information between the two respondents the response scale of the two group confirms that kaizen contributed to minimize waste in the production process and the factory’s different departments have reduced wastes in production and this helped the factory to increase production quality and quantity through implementation of 5S and 7 Mudass.

Therefore, it can be deduced that kaizen implementation has helped the Factory achieve its strategic plan and brought about considerable improvements in light of such parameters as efficiency, cost reduction and wise utilization of time and other resources.

**Table 4.2.2 Effect of Kaizen Implementation on Employees and Management**

No	Statements	Respon dents	Level of Agreement						Mean	SD	T-test	Sig
			Rating scale									
			1	2	3	4	5	Total				
1.	Implementation of kaizen contributes for network development between employees and management	KF	4	6	3	20	18	51	3.82	1.260	1.944	.050
		KPTL	22	20	38	51	43	174	3.42	1.318		
2.	Launching of kaizen in the factory developed trust and confidence between management and employees.	KF	4	5	4	18	20	51	3.88	1.259	1.914	.055
		KPTL	14	23	45	46	46	174	3.50	1.239		
3.	Implementation of Kaizen improved strong relationship between employees and management.	KF	4	6	2	26	13	51	3.75	1.197	1.141	.212
		KPTL	18	36	27	28	65	174	3.49	1.429		
4.	Implementation of Kaizen has increased unified commitment and involvement of both top level management and workers	KF	4	16	6	17	8	51	3.18	1.260	-.616	.528
		KPTL	15	24	67	30	38	174	3.30	1.203		
5.	Employees’ job satisfaction has been enhanced.	KF	0	20	2	19	10	51	3.37	1.199	-1.007	.310
		KPTL	16	15	44	52	47	174	3.57	1.232		

Table 4.2.2 presents the responses of the sample respondents regarding improvement in employees and management relationship and employees' job satisfaction as a result of kaizen implementation.

According to Table 4.2.2 items 1 and 3 (Implementation of kaizen contributes for network development between employees and management and Implementation of Kaizen improved strong relationship between employees and management), the responses of the respondent sample Kaizen Facilitators of the items are 3.82 and 3.75, respectively. The scale of item 1 and 3 lies on the range of "agree". The respondent KPT leaders mean responses of the same items 1 and 3 are 3.42 and 3.49, respectively, with the scale range of undecided. The t-values of the items are 1.944 and 1.141, respectively. However, the item is not significant statistically. This clearly shows that there is similar understanding between the factory sampled Kaizen Facilitators and KPT leaders respondents regarding the above items.

One can, from the above discussion, infer that kaizen implementation has contributes to network development between employees and management, improvement in relationship between employees and management. These have developed the motivation of workers and created sense of belongingness of the employees to the organization and enhanced productivity of the factory.

Regarding Table 4.2.2 item 2 (Launching of kaizen in the factory developed trust and confidence between management and employees.) The respondent sample Kaizen Facilitators' response mean of item 2 is 3.88. The scale of item 2 lies on the range of 'agree'. Similarly, the respondents KPT leaders mean of responses of the same item is also 3.50 with the scale range of agree again. The t-value of item 2 is 1.914. The data show that the item is not significant statistically. This revealed that there is a common understanding on the item between the factories sampled Kaizen Facilitators and KTP leader's group respondents.

Thus, there is significant improvement and development of trust and confidence between management and employees in the factory. That is, launching of Kaizen practice developed relationship between employees and management. As the researcher discussed with the two of the kaizen team leaders at the Factory, this development in employees' relationship has also helped make significant improvement on its productivity.



On the basis of Table 4.2.1 item 4 (Implementation of Kaizen increases unified commitment and involvement of both top level management and workers) the respondent sample Kaizen Facilitators response mean is 3.18. The sample Kaizen Facilitators respondent of the item response scale lies on the range of “undecided”. The sample respondent KPT leaders mean responses of the same item is 3.30. The respondent scale of the item also lies on the range of “undecided”. The t-value of item 4 is -.616. Thus the item is not significant statistically between the two group respondents and there is similar understanding and information between the two sample groups of this research.

This indicates that there is no sufficient information about the implementation of Kaizen to bring unified commitment and involvement of both top level management and workers in different activities including decision making regarding different issues. On the other hand, from the discussion made with some employees in different work units, the commitment of level has, no doubt, increased and the involvement of most top level management has been high. However, for this to be taken as a certain outcome, it needs further continuous assessment for its sustainability.

According to Table 4.2.1 item 5 (Employees’ job satisfaction is enhanced following kaizen implementation). The respondent sample Kaizen Facilitators’ response mean of item 5 is 3.37 with the scale range of “undecided”. Similarly the respondent KPT leaders mean responses of the same item is also 3.57 with the scale range of undecided. The t-value of the item is -1.007. The data show that the item is significant statistically. This means there is no enough information and understanding regarding the item in both sampled Kaizen Facilitators and KPT leader respondent groups.

It is possible to understand from the above item that both respondents sample groups have not enough information and they have a doubt as whether kaizen implementation has any relation with enhancement of employees’ job satisfaction. However, as could be understood from the information gathered during the field visit, the employees in each work unit were enthusiastic regarding kaizen implementation and each of them were trying to explain the benefit it brought about by comparing the previous and current state of the Factory. This has therefore to be further assessed by the factory’s management to ensure improved employees’ job satisfaction.

Generally, based on the findings with regard to Table 4.2.2, the implementation of kaizen in Wonji Sugar Factory has highly contributed to network development between employees and management, trust and confidence development between management and employees, development of strong relationship between employees and management, employees' job satisfaction. This directly helped the factory to develop its productivity.

The major findings from the above discussion on the basis of Table 4.2.2 are that Wonji Sugar Factory has improved relationship between employees and management and also employees' job satisfaction level upon implementation of kaizen.

**Table 4.2.3 Kaizen implementation and enhancement of working environment**

No	Statements	Respondents	Level of Agreement						Mean	SD	T-test	Sig
			Rating scale									
			1	2	3	4	5	Total				
1	To what circumstance has the freedom of the kaizen teams to change the work environment when needed been improved?	Mgr	2	3	5	30	11	51	3.88	.952	.693	.486
		KPTL	0	18	51	57	48	174	3.78	.968		
2	What is the conduciveness level of work environment created due to kaizen implementation?	KF	2	3	4	23	19	51	4.06	1.028	1.336	.159
		KPTL	0	15	45	66	48	174	3.84	.927		
3	Employees' work commitment has been improved due to implementation of kaizen.	KF	4	3	7	24	13	51	3.76	1.142	1.105	.237
		KPTL	6	15	60	60	33	174	3.57	1.005		
4	Management's work commitment has been improved as a result of implementation of kaizen.	KF	4	3	7	26	11	51	3.73	1.115	.750	.428
		KPTL	18	10	47	51	48	174	3.58	1.241		

Table 4.2.3 mainly presents the collected data and its analysis regarding the Kaizen implementation fruits in terms of employee's freedom of changing the work environment, opportunities of creating of conducive working environment and related factors like employees' work commitment in order to achieve the strategic objectives.

On the basis of Table 4.2.3 item 1 and 2 ('To what circumstance has the freedom of the kaizen teams to change the work environment when needed been improved?' and 'What is the conduciveness level of work environment created due to kaizen implementation?'), the respondent sample factory Kaizen Facilitators' response mean for item 1 and 1 are 3.88 and 4.06,

respectively. The sample respondent KPT leaders mean responses of the items are, correspondingly, 3.78 and 3.84. Both sample respondent scales of items lie on the range of agree. The t-value of item 1 and 2 are .693 and 1.336; thus, these items are not significant statistically. This revealed that both sample respondents have similar information and exposures regarding the improvement of Kaizen in creation of conducive working environment in the factory.

The important information that can be figured out from the discussions regarding the above two items are that there is considerable improvement in kaizen teams' freedom to change their work environment whenever needed and improving conduciveness level of their working environment is possible due to kaizen implementation in the factory.'

This can also be supplemented by the physical observation of the work environment and discussions with different employees. Attractive green work environment has been created as of the start of kaizen implementation. When the researcher asked "What could be the assurance of the work environment not to return from currently green and attractive to the previous state?", they answered with a short and to-the-point statement as: "Who prefers working in a filthy environment and inhale the dust to working in a clean environment and inhale fresh air coming from the green plants and vegetables?"

Table 4.2.3 items 3 (Employees' work commitment has been improved due to implementation of kaizen.): The respondent sample Kaizen Facilitators' response mean of item 3 is 3.76. The scale of item 3 falls in the range of "agree". Like Kaizen Facilitators respondents, the respondent KPT leaders mean responses of the same item is also 3.57 with the scale range of "agree". The t-value of item 3 is 1.105. The data show that the item is not significant statistically. This indicates that there is similar information and understanding by both respondents regarding the item.

As we can understand from the above discussions kaizen practice has enhanced employees' work commitment.

On the basis of Table 4.2.3 item 4 (Management's work commitment has been improved as a result of implementation of kaizen.): According to the collected data from respondents and obtained result of analysis of the software item 4 respondent sample Kaizen Facilitators' response mean is 3.73. Similarly, the respondent KPT leaders mean responses of the same item is 3.58. Both respondents' responses mean scale of item 4 lies on the range of "agree". The t-value of

this item is .750. Thus the item is not significant statistically. This means there is similar understanding and information between the factory Kaizen Facilitators and KPT leaders' respondent groups regarding Kaizen implementation and enhancement of management's work commitment like that of other non managerial workers.

The collected data and analyzed above disclose that Kaizen implementation in the factory increased management's work commitment.

Generally speaking, according to the finding on the basis of Table 4.2.3 and discussed above, Kaizen implementation brought significant achievements regarding such factors as employee's freedom of changing the work environment, opportunities of creating conducive working environment and related factors like employees' and management's work commitment for the factory all of which have contributed to the achievement of the strategic objectives.

**Table 4.2.4 Kaizen Implementation and its effect on Improvement in Team Building.**

No	Statements	Respondents	Level of Agreement						Mean	SD	T-test	Sig
			Rating scale									
			A	B	C	D	E	Total				
1	Team problem solving culture has been established.	KF	4	26	8	9	4	51	2.67	1.108	-4.572	.000
		KPTL	14	22	43	42	53	174	3.56	1.265		
2	Intra-team relationship has been improved since the start of kaizen.	KF	20	14	8	5	4	51	2.20	1.281	-5.369	.000
		KPTL	10	39	51	42	32	174	3.27	1.169		
3	Team effectiveness has been enhanced due to kaizen implementation.	KF	3	3	2	34	9	51	3.84	.987	-.757	.316
		KPTL	16	23	40	4	42	174	4.03	1.723		
4	Employees' attitude towards teamwork has been improved	KF	6	5	2	32	6	51	3.53	1.189	-.055	.955
		KPTL	15	21	40	51	47	174	3.54	1.247		

The above table contains important points that give answers for the questions that the research has put forward. The table discussed employees' attitude towards teamwork, team effectiveness and intra-team relationship as well as achievements of Kaizen implementation in terms of establishment of team problem-solving culture.

According to Table 4.2.4 item 1 (Team problem solving culture has been established.), the respondent sample Kaizen Facilitators' response mean is 2.67. The scale of item 1 lies on the

range of undecided. Unlikely, the respondent KPT leaders' mean responses of the same item is 3.56 with the scale range of "agree". The t-value of item 1 is -4.572. The data show that the item is statistically significant. This indicates that there is great difference between the two respondents' responses and this shows that the respondents did not have similar information on the item.

Based on the above analysis the Kaizen Facilitators we can see that it is questionable to conclude that Kaizen implementation had developed team problem solving-culture in the factory

On the basis of Table 4.2.4 item 2 (Intra-team relationship has been improved since the start of kaizen), the respondent sample factory Kaizen Facilitators' response mean for item 2 is 2.20. The sample respondent scale of the item lies on the range of "disagree". The sample respondent KPT leaders mean responses of the item is 3.27. The sample respondent scale of the item lies on the range of "undecided". The t-value of this item is -5.369, which implies that this item is significant statistically. This revealed that both sample respondents have not similar information and knowledge regarding the Intra-team relationship improvement, since the kaizen has been started.

This leads us to deduce that Kaizen implementation had little contribution for the development of the intra-team relationship and this factor needs to develop in the next phase of Kaizen implementation in the factory.

As we can see from Table 4.2.4, item 3 and 4 (Team effectiveness has been enhanced due to kaizen implementation and employees' attitude towards teamwork has been improved.), the respondent sample factory Kaizen Facilitators' response mean for the item are 3.84 and 3.53, respectively. The sample respondent KPT leaders mean responses of the same item are 4.03 and 3.54, respectively. Both sample respondent response scales of the items lie on the range of agree. The t-value of item 3 and 4 are -.757 and -.055; thus, the item is not significant statistically. This means both sample of Kaizen facilitators and KPT leaders responded with having similar information and with common understanding regarding the above items between the two respondent groups.

As we understand from the collected data and analysis implementation of kaizen in the factory brought various improvements including emergence of team effectiveness and enhanced employees' attitude towards teamwork.

All in all, employees' attitude towards teamwork has been improved in various ways and this contributed a lot for the successful Kaizen implementation of the factory. Team effectiveness has been enhanced due to kaizen implementation in the factory. However, the collected data show that, even though Kaizen practice has been implemented, intra-team relationship is not yet improved as expected. Similarly, team problem-solving culture has not been established and become effective as a successful team building.

**Table 4.2.5 Kaizen Implementation and effectiveness on improving employee and management relations.**

N o.	Statements	Respondents	Level of Agreement						Mean	SD	T-test	Sig
			Rating Scale									
			A	B	C	D	E	Total				
1	To what circumstance do you think power distance between employees and management has been minimized as a result of kaizen implementation?	KF	3	8	12	17	11	51	3.49	1.173	-.364	.708
		KPTL	6	29	40	60	39	174	3.56	1.115		
2	What is level of top management's involvement and support towards the implementation of kaizen at workplace?	KF	4	3	7	26	11	51	3.73	1.115	.750	.428
		KPTL	18	10	47	51	48	174	3.58	1.241		
3	What is the level of improvement in Management's work commitment as a result of implementation of kaizen?	KF	0	3	12	26	10	51	3.84	.809	.882	.335
		KPTL	3	11	61	57	42	174	3.71	.961		

This table refers to the power distance minimization between employees and management as a result of Kaizen implementation, the trust that has been developed between management and employees as a result of implementation of Kaizen and the level of the top management's involvement and support towards the implementation of Kaizen at workplace.

As we can see from Table 4.2.5, item 1 which is about whether the circumstance of power distance between employees and management has been minimized as a result of kaizen implementation, the respondent sample Kaizen Facilitators' response mean of item 1 is 3.49. The scale of item 1 lies on the range of "average". The respondent KPT leaders mean responses of

the same item is 3.56. The scale of item 1 lies on the range of “highly agree”. The t-value of the item is -.364 which shows that the item is not statistically significant. This clearly shows that there is similar information between the factory Kaizen Facilitators and KPT Leaders respondent groups regarding the circumstance of power distance between employees and management in the factory due to kaizen implementation. Thus, the factory Kaizen Facilitators and KPT Leaders respondents responded, respectively, as there is average and high minimization of power distance between employees and management.

The above item revealed that Kaizen implementation contributed to the creation of strong relationship between employees and management to achieve the factory’s objectives.

On the basis of Table 4.2.5 item 2 and 3 (‘What is level of top management’s involvement and support towards the implementation of kaizen at workplace?’ and ‘What is the level of improvement in Management’s work commitment as a result of implementation of kaizen?’), the respondent sample factory Kaizen Facilitators' response mean for items 2 and 3 are 3.73 and 3.84, respectively. The sample respondent KPT leaders mean responses of the same items are 3.58 and 3.71, respectively. Both sample respondents’ scales of the items lie on the range of “agree”. The t-value of items 2 and 3 are .750 and .882, thus the items are not significant statistically. This implies that there is similar information and understanding between both the factory Kaizen Facilitators and KPT leaders regarding the items.

These indicate that there was high involvement and support of top management in the implementation of Kaizen which contributed to the improvement of their work commitment.

**Table 4.2.6 Improving employees' work commitment, and developing a culture of working as a team**

N o.	Statements	Respond ents	Level of Agreement						Mean	SD	T-test	Sig
			Rating Scale									
			A	B	C	D	E	Total				
1	To what degree has employees’ work commitment been improved due to implementation of kaizen?	KF	2	2	5	25	17	51	4.04	.979	.705	483
		KPTL	0	12	42	66	54	174	3.93	.910		
2	Employees’ attitude towards teamwork has been improved.	KF	2	6	5	22	16	51	3.86	1.114	-.578	.564
		KPTL	6	15	30	51	72	174	3.97	1.117		

The above table discusses the degree of improvement in employees' work commitment as well as team effectiveness due to implementation of Kaizen.

As we can see from Table 4.2.6 item 1 and 2 ('To what degree has employees' work commitment been improved due to implementation of kaizen?' and 'Employees' attitude towards teamwork has been improved. '), the respondent sample factory Kaizen Facilitators' response mean of items 1 and 2 are 4.04 and 3.86, respectively. The sample respondent KPT leaders mean responses of the same items are, correspondingly, 3.93 and 3.97. Both sample respondents' scales for the items are on the range of "agree". The t-value of item 1 and 2 are .705 and -.578, thus the item is not significant statistically. This discloses that both sample Kaizen Facilitators and KPT leaders' respondents' responses are of similar information and there is common understanding regarding the above items in both respondent groups.

It is, therefore, possible to deduce from the the above discussion that implementation of kaizen in the factory brought various improvements among which changes in employees' work commitment and employees' attitude towards teamwork improvements can be pointed out.

In general, according to the above discussion based on data presentation using Table 4.2.1 - 4.2.7, implementation of kaizen has brought about various concrete results among which the following can be cited.

Launching of Kaizen in Wonji Sugar Factory has brought about such benefits as motivation and top level management's commitments to involvement and support in the line activities and for kaizen implementation practice, particularly, in all departments.

The data collected and analyzed in this chapter of the research also clearly show that Kaizen practice assure freedom and autonomous work environment for kaizen teams to conduct change whenever needed in order to improve the team effectiveness and co-learning and creativity has been enhanced.

One can also deduce that kaizen implementation has, through the application of the tools 5S's and 7 Mudras, increased creation of conducive work environment; facilitated safe and healthy work environment in all departments; helped ensure clean and attractive work environments



which, in turn, resulted in the factory's production enhancement through increasing the degree of employees' work commitment.

On the basis of the findings, the first phase Kaizen implementation has been successful in Wonji Sugar Factory. That is, Kaizen has paved the way for the factory's bright future through mobilizing resources, enhancing management members work commitment, facilitating team building.. Much more, the employees' attitude towards teamwork has been improved; that is, it has been possible to create effective team and work accomplishment. Furthermore, as has been discussed in the data analysis, Kaizen implementation in Wonji sugar factory has brought significant achievements on workers attitude and working environments. However, improvement developing problem solving culture in the factory and intra-team relationship needs have been found to require further efforts.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

This chapter deals with summary, conclusions and recommendation of the research. Accordingly, the first section gives brief discussions of the study. The second section presents the major findings and conclusions. The last part presents potential recommendations that the researcher believes could be good for the Factory and any other beneficiaries.

#### **5.1 Summary of Major Findings**

A survey was conducted using a questionnaire with structured questions divided into two parts: respondents' demographic information and respondents' opinions regarding the effectiveness of implementation of kaizen in Wonji Sugar Factory. A total number of two hundred twenty five (225) staff were selected to provide answers to the structured questions. In addition, data were collected through personal interviews with 7 staff members of the Factory.

According to the data collected, presented and analyzed in this research work, implementation of kaizen in Wonji Sugar Factory has highly contributed to meeting its strategic objectives. Thus, implementation of Kaizen has increased the practice of improving most of the factory's systems from time to time and it contributed a lot to every department's improvement through reducing production cost, applying wise resource utilization and through avoiding non value adding production instead of net production. It also has played a great role in minimizing power distance and built trust between employees and managers through shared common values, believes and improved relationship between employees and management for the success of the factory' objectives. It also has helped the Factory to improve its working environment as well as productivity. In addition, due to the fact that team spirit has been boosted due to kaizen implementation, the capacity of kaizen teams to change their work environment has considerably been improved.

Although considerable improvements have been resulted through the implementation of kaizen, the factory has, as per the data analysis and interpretation undertaken in Chapter Four, not yet improved team decision-making culture and intra-team relationship.

## **5.2 Conclusions**

The assessment done on Wonji Sugar Factory regarding effectiveness of kaizen implementation has come up with major findings discussed in previous sections. Based on these findings the following conclusion can be drawn.

Kaizen implementation in the Factory has highly been linked with and hence helped the Factory to achieve its strategic objectives.

Regarding improvement in employees' work behavior, major positive changes have been obtained in terms of improved relationship between employees and management, improved employees' satisfaction level with their job and their proven efforts made in continuously working to achieve remarkable waste reduction.

The finding that there is high improvement in the practice of the Factory's systems from time to time and conducive environment as a result of kaizen implementation leads to the conclusion that kaizen implementation can be taken as an enabling factor to bring about such technical outcomes as structure and work process.

As of the start of the implementation of kaizen, the use of the 5s and 7 mudas has enabled the Factory to highly improve its working environment in terms of creating clear and green areas at the factory.

In addition to the above major changes in the Factory as a result of kaizen implementation, considerable improvement in productivity has been achieved through reduction in cost and cycle time, wise utilization of resources and increased efficiency.

Finally, major improvements in social system (soft aspect) have been achieved by the Factory in terms of reduced power distance between management and employees, enhanced team effectiveness and improved employees' attitude towards teamwork.

On the other hand, little or no improvement has been achieved by Wonji Sugar Factory in light of team problem solving culture as well as intra-team relationship.

On the basis of the data analysis and interpretation regarding implementation of Kaizen, it has helped the factory. Accordingly, it has successfully contributed to the continuous improvement of the Factory's productivity. According to the response of the sample respondents, implementation of kaizen in the factory in different work units resulted in cost reduction, wise resource utilization and increased efficiency. Other important contributions of kaizen implementation, as the collected data witness, are network development and connectivity between employees and management, development of trust and confidence between management and employees as well as improved strong relationship between employees and management. This has directly helped the factory to develop its productivity. The collected data revealed that the implementation of Kaizen practice has brought about unified commitment and involvement of both top level management and workers for the factory's common objectives. Employees' job satisfaction has been enhanced; the factory's different departments have been striving to avoid wastes through implementation of 5Ss' and 7 Mudas. Kaizen practice brought changes through avoiding considerable wastes in production and this has helped the factory to increase production quality and quantity.

According to the data obtained in this assessment, Kaizen implementation brought significant achievements regarding employee's freedom of changing the work environment, opportunities of creating conducive working environment and related factors like employees' and management's work commitment for the factory in order to achieve its strategic objectives.

The data that were collected and analyzed above have given clear information regarding the Kaizen implementation and its various results in terms of the achievement of its strategic objectives and increased practice of improving the factory's systems from time to time. It has also contributed a lot to the factory's every department improvement through reducing

production cost, applying wise resource utilization and through avoiding non value adding production instead of net production. Furthermore, kaizen implementation has minimized power distance and built trust between employees and managers through shared common values, believes and improved relationship and connectivity between employees and management bodies for the success of the factory's objectives'.

As the collected data witness, launching of Kaizen in Wonji sugar factory brought motivation and top level management's commitment and involvement in supporting the line activities and kaizen implementation practice in all departments. It is very important here to note that Kaizen practice has assured freedom and autonomous work environment for kaizen teams to conduct change whenever needed in order to improve the team effectiveness, co-learner and creativity has been enhanced.

The respondents' responses further assure that due to kaizen implementation conducive work environment has been created; Kaizen practice in all departments has facilitated safe and healthy work environment; implementation of 5Ss' has assured clean and attractive work environment which, in turn, resulted in the factory's production enhancement through increasing the degree of employees' work commitment. On the basis of the analyzed data which are collected from the factory's sample managerial and KPT leaders, the first phase of Kaizen implementation has been successful in the factory. This shows that Kaizen paved the factory's bright future through mobilizing resources, enhancing management members' work commitment, facilitating team building, developing problem solving culture in the factory, making smooth relationship in the same and different levels and intra-team relationship. Much more, the employees' attitude towards teamwork has been improved. Thus, it is possible to create effective team and work accomplishment.

All in all, though there still are some considerations, such as intra-team development and team problem-solving culture, to be taken care of, implementation of kaizen has been effective in that it has helped the factory revive from a declining trend in productivity and improve its profit.

### 5.3 Recommendations

Based on the findings and conclusions of the study, the researcher would like to forward the following recommendations in the hope that it may help to ensure successful Kaizen implementation.

- ❖ Kaizen implementation in Wonji Sugar Factory is very successful and it brought a significant achievement in various activities. Maintaining this success is a very important issue to ensure continuous improvement. Thus, the factory should apply different techniques like motivation scheme in the factory and strategic plan with reasonable budget to sustain Kaizen improvements.
- ❖ It would be advisable to provide periodic training for all senior members of the factory, particularly, newcomers to ensure sustainability of the full implementation of Kaizen in the Factory.
- ❖ Kaizen practices are effective in terms of team working, facilitating effective relationship between managerial and front-line workers. It has helped a lot in cost reduction in the process of production and related activities. Recording the results which have been obtained through Kaizen implementation would be very good to measure the aggregate results within a longer period so as for it to be among the factors that will bring significant contributions to motivate all the factory workers to stand for Kaizen implementation.
- ❖ The factory's management may its Kaizen implementation as a master key in order to address limitations in intra-team relationship and conflict resolving mechanism, through establishing a system of conflict management.
- ❖ The Ethiopian Sugar Corporation and Ethiopian Kaizen Institute (EKI) should conduct continuous follow-up and provide unreserved support in order not for the positive changes to backslide and create doubt for its sustainability. In addition to this, providing

acknowledgement for its progressive Kaizen implementation is very important to encourage its better achievements.

- ❖ Finally, Wonji sugar factory needs to sustain and transfer its Kaizen practice for the better and it would be advisable if the factory establishes its own Kaizen practice considering the unique situation based on Kaizen philosophy. The factory is also advised to modify its Kaizen implementation to solve all the factory problems including intra-team relationship and the factory Kaizen production teams in order to resolve any conflicts. The major success of Kaizen is making implementation of Kaizen sustain, thus the factory is expected to communicate and create awareness about its Kaizen agenda, frequently, for its workers and stakeholders by using different media to maintain sustainability.

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## **DECLARATION**

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Asst. Professor Shoa Jemal. All sources of material used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institutions for the purpose of earning any degree.

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Name

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Signature

**St. Mary's University, Addis Ababa**

**June, 2015**

## **ENDORSEMENT**

This thesis has been submitted to St. Mary's University, School of Graduate studies for examination with my approval as a university advisor.

Shoa Jemal (Asst. Professor )

Advisor

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Signature

**St. Mary's University, Addis Ababa**

**June, 2015**

**St. Mary's University**

**Questionnaire on Effectiveness of Kaizen Implementation in Wonji Sugar  
Factory**

**Questionnaire**

**Questionnaire to be Filled by Kaizen Facilitator and Kaizen  
Production Team Leaders**

Dear Respondents,

This questionnaire is designed based on the Topic: **Assessing the Effectiveness of Kaizen Implementation in Wonji Sugar Factory**. The main purpose of this questionnaire is to obtain information about your company's overall experience with Kaizen events to date and effectiveness of Kaizen Implementation in your Organization.

Any information you give would be kept confidential as the data are needed for academic purpose only.

Your kind cooperation is very much appreciated.

With best regards,

**Part I: General Information**

**INSTRUCTIONS:** Please answer by making a tick (√)

1. Gender:    A. Male ( )    B. Female ( )
2. Age:        A. 17-30 ( )    B. 31-40 ( )        C. 41-50 ( )    D. 50+ ( )
3. Current position:        A. Managerial ( )    B. Non-managerial ( )
4. Educational Background (tick only the highest level you have):  
A. Masters ( )        B. Bachelors        C. Diploma    D. Completed High school  
E. Completed Elementary School        Other.....

5. Years of Service: A. less than 1 year ( )      B. 2 to 10 years      C. 11 to 15 years  
D. 16 to 20 years      E. 20+ years

**Part II: Opinion Survey on Kaizen Implementation**

**Key: 1-Highly Disagree, 2-Disagree, 3-Undecided, 4-Agree and 5-Highly Agree**

S/No.	Dimension	Questions	Level of agreement or disagreement				
			1	2	3	4	5
•	Improving technical systems outcomes which result in positive achievements in various aspects;	<ul style="list-style-type: none"> <li>• Has the implementation of Kaizen helped the Factory achieve its strategic objectives?</li> <li>• Has the implementation of Kaizen increased the practice of improving the Factory’s systems from time to time?</li> </ul>					
•	Increasing efficiency in cost, time and resource utilization.	<ul style="list-style-type: none"> <li>• Do you think the implementation of kaizen in your work unit has resulted in <ul style="list-style-type: none"> <li>• Cost reduction?</li> <li>• Cycle time reduction?</li> <li>• Improvement in resource utilization?</li> </ul> </li> </ul>					
•	Improving employees and management relations	<ul style="list-style-type: none"> <li>• More trust has been developed between management and employees since the launching of kaizen in the Factory.</li> <li>• Implementation of Kaizen has improved relationship between employees and management.</li> <li>• Top Management Involvement and Support Towards the Implementation of Kaizen At Workplace</li> </ul>					
•	Enhancing employees’ satisfaction with their job.	Employees’ satisfaction level with their job has been enhanced since the start of kaizen implementation.					
•	Improving working environments/climate	<ul style="list-style-type: none"> <li>• The kaizen teams had the freedom of changing the</li> </ul>					

		<p>work environment when needed.</p> <ul style="list-style-type: none"> <li>• Conducive working environment has been created due to kaizen implementation.</li> </ul>					
	<ul style="list-style-type: none"> <li>• Improving management and employees work commitment</li> </ul>	<ul style="list-style-type: none"> <li>• Employees' work commitment has been improved due to implementation of kaizen.</li> <li>• Management's work commitment has been improved as a result of implementation of kaizen.</li> </ul>					
<ul style="list-style-type: none"> <li>•</li> </ul>	<p>Developing a culture of working as a team/team spirit.</p>	<ul style="list-style-type: none"> <li>• Team problem solving culture has been established.</li> <li>• Intra-team relationship has been improved since the start of kaizen.</li> <li>• Team effectiveness has been enhanced due to kaizen implementation.</li> <li>• Employees' attitude towards teamwork has been improved.</li> </ul>					
<ul style="list-style-type: none"> <li>•</li> </ul>	<p>Kaizen Implementation and effectiveness on improving employee and management relations.</p>	<ul style="list-style-type: none"> <li>• To what circumstance do you think power distance between employees and management has been minimized as a result of kaizen implementation.</li> <li>• What is level of top management's involvement and support towards the implementation of kaizen at workplace?</li> <li>• What is the level of improvement in Management's work commitment as a result of implementation of kaizen?</li> </ul>					

<ul style="list-style-type: none"> <li>•</li> </ul>	<p>Improving employees' work commitment, and developing a culture of working as a team/team spirit.</p>	<ul style="list-style-type: none"> <li>• To what degree has employees' work commitment been improved due to implementation of kaizen?</li> <li>• Employees' attitude towards teamwork has been improved.</li> </ul>					
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