St. MARY UNIVERSITY

SCHOOL OF GRAGUATE STUDIES

ASSESSMENT OF THE SUCCESS AND FAILUR OF KAIZEN IMPLEMENTATION IN MUGHER CEMENT FACTORY IN RESPECT OF PRODUCTIVITY

(Between 2015- 2017 year)

BY

FIKADU DEME MINDA

MAY; 2018

ADDIS ABABA, ETHIOPIA

ASSESSMENT OF THE SUCCESS AND FAILUR OF KAIZEN IMPLEMENTATION IN CEMENT MANUFACTURING. THE CASE OF MUGHER CEMENT FACTORY.

BY

FIKADU DEME MINDA

A THESIS SUBMITTED TO ST.MARRY'S UNIVERSTY,INSTITUTE OF QUALITY AND PRODUCTIVITY MANAGEMENT IN PARTIAL FULFILLMENT OF THE REQUIRMENT FOR THE DEGREE OF MASTER OF SCIENCE IN QUALITY AND PRODUCTIVITY MANAGEMENT

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APPROVED BY BOARD OF EXAMAINNORS

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DECLARATION

I the undersigned, declare that this thesis is my original work, prepared under the guidance of my Advisor Mr.Matias Taye. All sources of materials 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 institution for the purpose of earning any degree.

Name Fikadu Deme Signature_____

St. Mary's University, Addis Ababa May,2018

ENDORSMENT

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

Advisor Mr.Matias Taye Signature_____

St. Mary University, Addis Ababa May;2018

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List of Abbreviations

CBE	Commercial Bank of Ethiopia
CCS	Civil Communication Section
ESS	Economic and Scientific Section
JICA	Japan International Corporation Agency
KPI	Key Performance Indicator
MCF	Mugher Cement Factory
TPS	Toyota Production System
TWI	Training Within Industry

ABSTRACT

The purpose of the study is to assess the success and failure of kaizen implementation in Mugher Cement Factory with respect to productivity. To address the issue back ground of the study has highlighted and research questions and objective of the study was formulated emphasizing on the way of testing the level of implementation of policies, principles and tools of kaizen in the case company. Theoretical and practical significance of the study is stated in respect of kaizen roadmap and its practical applicability in more effective way. Efforts have made to review relevant literatures and hypothetical model has proposed for effective kaizen implementation. Major factors that contribute for success and failure for the kaizen implementation project has indicated. Primary data are collected using questioner from 62 teams from population of 100 kaizen team using judgment sampling method. Discussion was held with selected management team. Relevant internal and external materials have reviewed. Data gathered has analyzed using descriptive and SPSS statistics and presented using tables, pie chart, bar cart, Pareto diagram. Gap on the implementation has clearly indicated pointing on such factors as absence of kaizen strategic planning, prioritizing of implementation area, lack of management commitment, misconception of kaizen. Conclusion and recommendation has forwarded that can help for future improvement and better kaizen project implementation at cement manufacturing sector.

CHAPTER ONE: Introduction

1.1. Background of the study

The Japanese word kaizen simply means "change for better", with inherent meaning of either "continuous" or "philosophy" in Japanese dictionaries and in everyday use. The word refers to any improvement, one-time or continuous, large or small. [8]

In the early part of the 20th century, the term Kaizen gradually started to appear in published Japanese works. However, it was not a word widely used by the general population. Kaizen was mainly used as a technical term in books and did not cross over into the modern spoken vernacular. Starting around the 20th century, the industrial engineering movement in the United States and other countries made method-based improvement a priority. Works by Fredrick Taylor Frank and Lillian Gilbert and others in the field become popular topics… The term kaizen started to proliferate inside the company in 1950s and 1960s as an ongoing part of the Toyota production system (TPS) development. Developing people who could analyze work methods and make improvements (i.e. creativity before capital) was a large priority. [18]

As part of the Marshall Plan after World War II, American occupation forces brought in experts to help with the rebuilding of Japanese industry while the Civil Communications Section (CCS) developed a management training program that taught statistical control methods as part of the overall material. Homer Sarasohn and Charles Protzman developed and taught this course in 1949-1950. Sarasohn recommended W. Edwards Deming for further training in statistical methods. [9]

The Economic and Scientific Section (ESS) group was also tasked with improving Japanese management skills and Edgar McVoy was instrumental in bringing Lowell Mellen to Japan to properly install the Training Within Industry (TWI) programs in 1951. The ESS group had a training film to introduce TWI's three "J" programs: Job Instruction, Job Methods and Job Relations. Titled "Improvement in Four Steps" (Kaizen eno Yon Dankai) it thus introduced kaizen to Japan. [8]

It has spread among Japanese companies in Japan and latter to abroad. JICA has played great role in assisting the spread of kaizen to many developing countries in Asia, Latin America, Eastern Europe and Africa towards industrial development. [10]

Following request from Prime Minister Meles to Japanese Government (July, 2008) on policy dialogue on Industrial Development held in Japan; kaizen introduced to Ethiopia through support of JICA [22]

During the first two-year period of JICA support (the study on quality and productivity improvement in Ethiopia, from October 2009 to May 2011), pilot company projects were implemented, and their results have been disseminated; the JICA experts conducted training for the staff of the Kaizen unit of the ministry of Industry (MOI) to transfer relevant skills and techniques; and a national plan has been formulated to disseminate Kaizen activities for manufacturing companies. As a result, Kaizen has come to be known among policy makers and business managers in Ethiopia. Based on these achievements, the Ethiopian government has decided to establish a core organization responsible for quality and productivity improvement, i.e. the Ethiopian Kaizen Institute (EKI) in 2009. [22]

As mentioned above; In Japanese Kaizen means "continuous improvement." The word implies improvement that involves everyone-both managers and workers-and entails relatively little expenses…Although improvements under kaizen are small and incremental; the kaizen process brings about dramatic results over time. [22]

Kaizen is also a low risk approach. Managers always can go back to the old way without incurring large cost. [23]

Mugher cement factory is one of the manufacturing enterprises of Ethiopia which used to implement kaizen for the achievement of its mission, vision and its core values which is stated as follows.

"Mission; to guarantee our customers utmost satisfaction and to promote national development by utilizing the state of art technologies and highly competitive workforce in manufacturing & marketing of cement products through operational efficiency, excellence and sustainability."

"Vision 2020; to be globally competitive cement producer."

"Core Values"

- Committed to clean production.
- Foster teamwork to achieve excellence.
- Value most the opinions of customers as they are critical to success.
- Strive to sharpen customer focus and achieve excellence.
- Strive to create an empowered workforce with a high sense of ownership.
- Pursue transparent, responsible and cost-efficient work processes.
- Believe a competitive, committed and productive workforce underpins its success.
- Maintain good relations with our stakeholders."

The factory started to implement Kaizen since 2014, using the support offered from EKI, mainly to strengthen its market competitiveness which becomes intensified recently.

The interest of this paper is, therefore, to insight the extent of the implementation of kaizen in the factory, its success and failure in respect of productivity and to see other contributions the system gains for the factory.

There is no conducted research on cement manufacturing of Ethiopia as such with regards assessing the success and failure of kaizen. Therefore this research is the first of its kind on doing such research centering Mugher Cement factory hopping that it will become a knowledge source for the future improvement of kaizen implementation.

1.2 Background of the company

Mugher Cement factory is a state owned company established in 1984 with a purpose of producing and selling cement and carrying out related activities that are important for the attainment of its objective. Initially it was established with an authorized capital of Birr 334,716,000.00 /three hundred thirty four million seven hundred sixteen thousand birr/ of which birr 257,516,000.00 /two hundred fifty seven million five hundred sixteen thousand birr/ and expand its capacity by 150% in year 2011 with 138.37 million USD.

The Factory's main plant is located about 90kms North West of the Capital city, Addis Ababa, at the elevation of about 2450 mts above sea level. This mother plant of the company has three production lines with a production capacity of 5000 tons of clinker per day. The first, second and third lines started operation in 1984, 1990 and 2011

respectively. In terms of cement Mugher has the capacity to produce 2.2 million ton per year.

The first and second line plants were established with long term loan secured from the development bank of Ethiopia and former East German Government plus a financial outlay from the treasury of Ethiopian government. The third line plant total capital outlay was USD 138.37 million out of which USD 90.98 million was a loan secured by commercial bank of Ethiopia (CBE) from EX-IM (Export-Import) bank of china and loaned out to the Enterprise. And birr 692 million loan secured from the industrial development fund (IDF)

The first and the second line technology are outdated, in comparison to the third line, and their cost of production per unit of cement product is very high.

Mugher Cement Factory also has a paper sacks making plant in the compound of Addis Ababa branch office. This plant was established in the year 2000 with the objective of producing and supplying valve paper sacks which are to be used for packing Cement, Lime, fillers and other powdered products. The production capacity of the paper bag plant is 60 million pieces of paper sacks per annum.

The Factory uses Limestone, Clay, pumice, Sandstone, Gypsum and electric power from local and imported coal and Kraft paper as its major input.

The enterprise distributes its products to the local market from the plants premises, through its own branch sales outlets located at Addis Ababa, Tatek and Adama /Nazareth/ city. Currently the factory has a total of 1430 employees.

1.3 Management system and structure

The management of Mugher Cement Factory structure has one General Manager that report to Chemical Industry Corporation. There are two deputy general managers' who reports to the general manager; Core operation deputy general manager and Service deputy general manager. Raw material production and supply, clicker production,

Cement production, Engineering, marketing, procurement, and laboratory departments are organized under core operation general manager. Where as Corporate finance, Human Resource, corporate Information technology and system development, Health service departments are organized under service deputy general manager.

In order to assure full involvement management and workers the structure of kaizen implementation team formation is highly realigned with the core structure of the company.

2. Statement of the problem.

The ultimate goal of business enterprise is profit maximization. This can be possible, among others, by employing latest technology, by increasing operational efficiency, utilization of capacity to the maximum and thereby reducing cost of production as minimum as possible in comparison to the competitors in the market.

To see this situation in the Cement sector of our country in terms of capacity utilization and competitiveness, marketing performance data, of specific time, of top four factories has collected. The design and installed capacity of the factories' is the same (i.e. 5000 ton/day clinker production)

2016/17 Budget year 9 month, top big four factories sales performance data has presented as follows.

Table 1:-sales performance of four cement factories

SN	Company name	Sales In tone	Market share in %
1	Dangote Cement Factory	1,490,914.6	27.7
2	Mossebo Cement Factory	1,275,722.7	23.7
3	Derba Cement Factory	1,185,769.63	22
4	Mugher Cement Factory	668,223.4	12.4

(Source Mugher cement Factory marketing promotion study 2017)

At present state, using new technology is found to be the ground for competing within the cement manufacturing in Ethiopia. Most of the recently established cement factories join the sector with high tech, high capacity and low energy cost utilization. These situations

give them advantage to lower unit price of production and intensify market competition. On the other hand Mugher cement factory line one and two operating using technology of four decades back. The operation of these lines is very expensive and has operational wastes (energy, material, labor) on their process. This condition put the factory into disadvantaged position in the competition. In order to improve its internal production process inefficiency the management started to implement kaizen tool as means for cost effectiveness. Kaizen was selected as a tool, among others, because it is continous approach, it is participatory; it is accumulation of small improvement, and improvement without major investment. [3]

So the management has convinced that this tool enable to reduce waste, increase quality enhance efficiency through standardizing production processes. Therefore, this paper is directed to determine the best practice in Kaizen implementation and test its application at a case company; and thus, help determine the gaps and challenges for its realization.

3. Research Question.

- ✓ Do the policy, principles and implementation tools of kaizen philosophy in place by Mugher cement factory?
- ✓ How and to what extent does kaizen philosophy and the tools known by all management and labor force?
- ✓ Does the implementation of kaizen tools ensure Mugher Cement Factory product quality, serves excellence and market competitiveness?
- ✓ What main challenges were encountered while implementing the kaizen tool?
- ✓ What would be the additional suggestion to employee and management for adopting the kaizen principles and tools?

4. The Research objective.

4.1 General objective

The main objective of this research paper is to assess the effectiveness of Kaizen implementation in Mugher Cement Factory. It aims to address this through assessing and determining a comprehensive kaizen implementation roadmap and testing its applicability at the case company production process.

4.2 Specific objective

1. Review and develop a kaizen implementation roadmap for successful implementation at a manufacturing plant.
2. Describe the relevant dimensions, principles and tools of Kaizen necessary for ensuring successful implementation at a manufacturing plant
3. Study the level of kaizen implementation and its effects at the case company with respect to the theoretical roadmap
4. Study the major challenges of kaizen implementation at the case company
5. Propose recommendation based on the analysis of the research.

5. Significance of the study

The theoretical relevance of this study is the development and testing of a kaizen implementation roadmap in assuring successful implementation of kaizen at a manufacturing plant. This would also add to the body of knowledge for the applicability of the developed roadmap for a specific sector, cement processing.

The practical relevance for the specific process in consideration is that it helps assess the applicability of the roadmap for the case company and the challenges encountered so that further improvements can be initiated and performed.

6. Delimitation (scope) of the study

The scope of this study will be limited to Mugher cement factory mother plant, covering from raw material preparation and supply department, clinker production (intermediate product for cement) department, cement production department, Engineering, Quality control sub process and Human Resource departments.

7. Limitation of the study

The research data gathered, mainly, by using questioner, in this process some kaizen team members didn’t respond as required due to their late joining to Mugher Cement Factory.

8. Definitions of the terms

Kaizen (Kai-Zen) = It is a Japanese word; “Kai” means change and “Zen” means good. Change for good continuously.

Gemba; Japanese word = Real work place

Kaizen Blitze (Kaikaku) = Kaizen events

Muda; Japanese word = waste

Mura; Japanese word = Imbalance

Muri; Japanese word = Eliminate

Seri; Japanese word = Sort items as per its usage.

Seiton; Japanese word = Set in order

Seiso; Japanese word = Shine, clean

Sekuetsu; Japanese word = Standardize

Shitsuke; Japanese word = Sustain, make it continous.

9. Organization of the study

Pre hand information was collected for determination of the title of the research and three optional research topics has presented to the university. Discussion held on the optional titles and one was selected. Proposal has prepared and defends in presence of advisors on the selected research title. The main research has commenced as per the schedule presented on proposal. The research study has organized in five chapters.

The first chapter gives general over view on the background of the study, background of the case company, statement of the problem, objective of the study, research question, significance of the study, delimitation of the study, limitation of the study, the organization of the paper and operational definition.

The second chapter deals with literature review (kaizen principles and tools, kaizen road map, factors contribute to kaizen implementation, hypothetical model...), to support the research in discussing the relevant literature.

The third chapter deals with methodology of the study. The fourth chapter presents data analysis and the findings of kaizen implementation. The fifth chapter covers the summary, conclusion and recommendation part.

Finally bibliography of the reference material and sample of the questioners are attached at the end of this paper.

CHAPTER TWO

Literature Review

2.1 Introduction

In the early part of the 20th century, the term Kaizen gradually started to appear in published Japanese works. However, it was not a word widely used by the general population. Kaizen was mainly used as a technical term in books and did not cross over into the modern spoken vernacular. Starting around the 20th century, the industrial engineering movement in the United States and other countries made method-based improvement a priority. Works by Fredrick Taylor Frank and Lillian Gilbert and others in the field become popular topics… The term kaizen started to proliferate inside the company in 1950s and 1960s as an ongoing part of the Toyota production system (TPS) development. Developing people who could analyze work methods and make improvements (i.e. creativity before capital) was a large priority. [18]

In Japanese Kaizen means "continuous improvement." The word implies improvement that involves everyone -both managers and workers- and entails relatively little expenses. The kaizen philosophy assumes that our way of life-be it our work, our social life or our home life-should focus on constant improvement effort. This concept is so natural and obvious to many Japanese that they do not even realize they process it. Although improvements under kaizen are small and incremental, the kaizen process brings about dramatic results over time. The kaizen concept explains why companies cannot remain static for long in Japan. Western management, meanwhile, worships innovation: major change in the wake of technological breakthroughs and the latest management concepts or production techniques. Innovation is dramatic, a real attention-getter. Kaizen, on the other hand, is often un-dramatic and subtle. But innovation is one shot, and its results are often problematic, whereas the kaizen process, based on commonsense and law-cost approaches, ensures incremental progress that pays off in the long run. Kaizen is also a law risk approach. Managers always can go back to the old way without incurring large cost. [23]

2.2 Kaizen Principles and Tools

The two key features of *Kaizen* are *incremental and continuous improvement* and *involvement of the entire workforce* in that process. The workforce, every worker, needs to participate in producing small but frequent changes by making suggestions for improvement in both process and product. Beyond that, the logical structure of the concept of *Kaizen*, the precise relationship among its tools, and concrete measures and sequences adopted on the factory floor, are difficult to pin down since there are many different schools of teaching that emphasize different aspects and tools of *Kaizen* relative to others. Even among excellent companies, Toyota's way is different from Honda's way, and the Panasonic philosophy is quite distinct from Canon's. [17]

According to Masaaki Imai, who introduced *Kaizen* to the international audience with his seminal book, *Kaizen: The Key to Japan's Competitive Success, Kaizen* is an umbrella concept for a large number of Japanese business practices (Imai, 1986; 1997) It could even be argued that, like Zen Buddhism, it is not just management technique but a philosophy which instructs how a human should conduct his or her life. *Kaizen* focuses on the way people approach work. It shows how management and workers can change their mindset together to improve their productivity. [17]

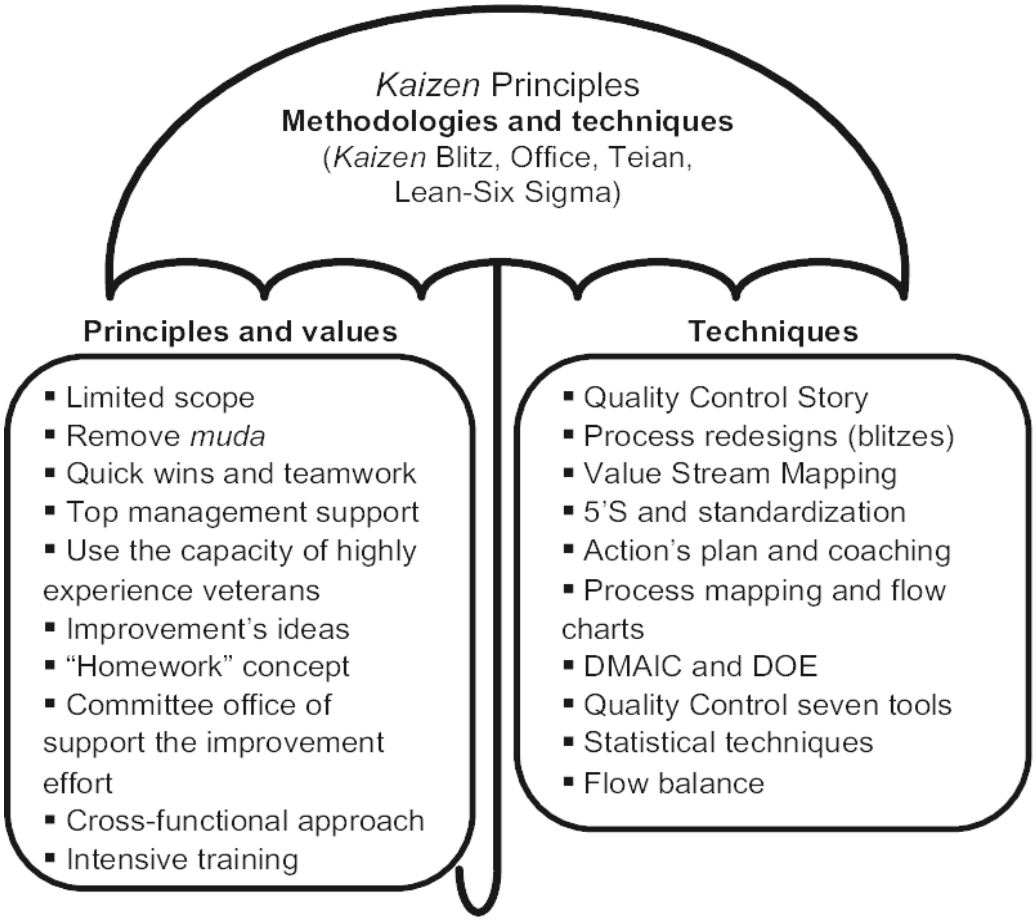
2.3 Kaizen basic Concept

The other point to be emphasized is that, management must learn to kaizen basic concepts and systems in order to realize kaizen strategy. The kaizen basic concept includes:-

- Kaizen management
- Process versus result
- Follow the plan-do-check-act (PDCA)/standardize -do-check -act (SDCA) cycle
- Putting quality first
- Speak with data
- Customer (GEMBA KAIZEN 2ND EDITION P 3)

Kaizen is an umbrella-shaped concept including most specific Japanese management methods which have recently found international fame [6]

Figure 1:-kaizen principles values and techniques



Source; - www.google.com/imageres

A kaizen method includes;

- 4M and 1E (Machine, Material, Man power, Method and Environment)
- Avoiding of 3M ;(Mura, Muri, Muda)
- Human resource emphasis: (20% structure, 20% Technology, 60% human resource development contributes the overall success of the company.)
- Using Kaizen board.

2.4 Kaizen Significance

The kaizen philosophy was developed to improve manufacturing processes, and it is one of the elements which led to the success of Japanese manufacturing through high quality and low costs. However, one can gain the benefits of the kaizen approach in many other working environments too, and at both a personal level or for your whole team or organization. [5]

Kaizen has a number of significance; some of them are listed as follows:-

- Less waste – inventory is used more efficiently as well employee skills.
- People are more satisfied – they have a direct impact on the way things are done.
- Improved commitment – Kaizen promote team work at shop floor or front line workers. It aims to build capacity of members, enhance the sense of achievement in work, make workers easier to work in and improve the satisfaction of customers. [4] Team members have more of a stake in their job and are more inclined to commit to doing a good job.
- Improved retention – satisfied and engaged people are more likely to stay.
- Improved competitiveness – Kaizen is aimed at decreasing waste through eliminating overproduction, improving quality, being more efficient, having less idle time, and reducing unnecessary activities. All these translate to money savings and turn potential losses into profits.
- Improved consumer satisfaction – coming from higher quality products with fewer faults.
- Improved problem solving – looking at processes from a solutions perspective allows employees to solve problems continuously. [5]
- Economic significance - In manufacturing, kaizen relates to finding and eliminating waste in machinery, labor or production methods. Bassant and Caffyn (1994) further add that Kaizen is a process focused and sustained innovation throughout the organization that is in the form of small incremental projects. It means systematic way of small incremental changes toward betterment in each place and each department. [21]

- Kaizen is improvement without major investment; it is accumulation of small improvement in continous approach. By implementing 5S's, and the 7west reduction methods. It is Improvement tool to reduce cost, improve quality of product and improve delivery time.

  "It is important to indicate that cost doesn't mean simply cutting cost or job. Reducing cost means eliminating west in any process that doesn't add value to the customer. Less inventory, fewer defects, less waiting time, and so on all lead to greater productivity of the factors involved in production. This is the true spirit of kaizen – establish more efficient uses of existing resources by taking out the waste or unnecessary details that do not add value or improve value to the customers. Companies that can accomplish this goal will reduce cost and help improve profit." [18]
- Team work and Knowledge sharing significance- Kaizen is participatory by its very nature which involves management to shop floor employee. These situations develop a sense of belongingness to the company and also encourage individual development and team based problem solving process. This enhances engagement of people and strengthens team productivity. Kaizen team is very help full especially where there is high turnover of employee is there. The continous interaction and joint performance can help new intranets to adopt easily the work process and system through the kaizen team. [4]

  There are also other scholars who put kaizen philosophy principles based on the following twenty basic principles [6]

2.5 Twenty principles of management in Kaizen

1. Never say why. Think how to do it.
2. Don't be worried about the problem and just take action to fix it.
3. Don't be satisfied from the existing situation. Believe that there is always a better way.
4. If you make a mistake, immediately try to fix it.
5. Don't look for perfection to fulfill your objectives. If you are 60% sure about fulfilling the objectives, take an action.

6. In order to find out problem's root, ask five times "why"?
7. Gemba is real place of error occurrence.
8. Use always little and modern information and data in order to solve the problem.
9. To solve problems, do not spend a lot of money. In case you cannot find a wise solution, you should ask your colleagues and use common wisdom.
10. Never forget the details and fine points. Most problem stem from such fine points.
11. Senior management support is not limited to words and promises. Management must have both tangible and evident presence.
12. Do not hesitate to assign authority to subordinates wherever is possible.
13. Never look for guilty. Don't judge hastily.
14. Visual management and information transmission are the best tools collectively to solve problems.
15. One-way communication command makes organizational problems more complicated from top to the bottom. The senior management should have a bilateral relationship with lower layers of the organization.
16. Human has a variety of abilities. Use multi skill patterns and job make wealth to flourish them.
17. Make merely the activities which brings added value for your organization.
18. Don't forget that 5S is base and foundation of creating high-quality productions.
19. To solve problems of your workplace based on workgroup's patterns.
20. Muda removal is an endless process. Don't ever get tired of it [5]

The pioneer of kaizen, ***TOYOTA Company developed 14 principles*** through its long way business process and called it Toyota way.

"Since Toyotas founding we have adhered to the core principle of contributing to society through the practice of manufacturing high-quality products and services. Our business practices and activities based on the core principles created values, beliefs and business methods that over the years have become of competitive advantage. These are the managerial values and business methods that are known collectively as the Toyota way; Fujio Cho, President Toyota" [19]

2.6 Kaizen road map

Although kaizen strategy aims at making improvements, its impact may be limited if everybody is engaged in kaizen for the kaizen's sake without aim. Management should establish clear targets to guide everyone and make certain to provide leadership for all kaizen activates directed towards achieving the targets. Real kaizen strategy at work requires closely supervised implementation. .. Top management must devise a long term strategy, broken down in to medium –term and annual strategies. Top management must have plan-to-deploy strategy, passing down through subsequent levels of management until it reaches the shop floor. [22]

Successful implementation of kaizen requires proper planning of every activities going to be carried out. In the preparation and use of such a planning document an 18-month outline is a good start, with the understanding that the freedom exists to revise the last 6 months of the plan as conditions warrant. [20]

Scholars and institution propose different kaizen implementation roadmap models. To high light some of them.

Archfield consulting group developed cyclical kaizen Road map containing the following continous Improvement 9 steps. [7]

- Separate value added from non value added steps.
- Eliminate unnecessary non value added and plan counter measure.
- Reality check
- Make changes
- Verify changes
- Measure results
- Make this standard
- Celibate
- Do it again

According to this model the above mentioned steps should be done within two to five days.

Operational Excellence Consulting has also developed kaizen roadmap containing the following six steps. [34]

- Discover important potential.
- Analyze current methods.
- Generate original ideas.
- Develop an implemntation plan.
- Implement the plan.
- Execute the new method

This model left open the time period for implementation for completing the whole cycle.

Kaizen Institute of India developed kaizen road map model, named **Change management model**. [9]

According to this model Successful kaizen strategy bases on three pillars:-

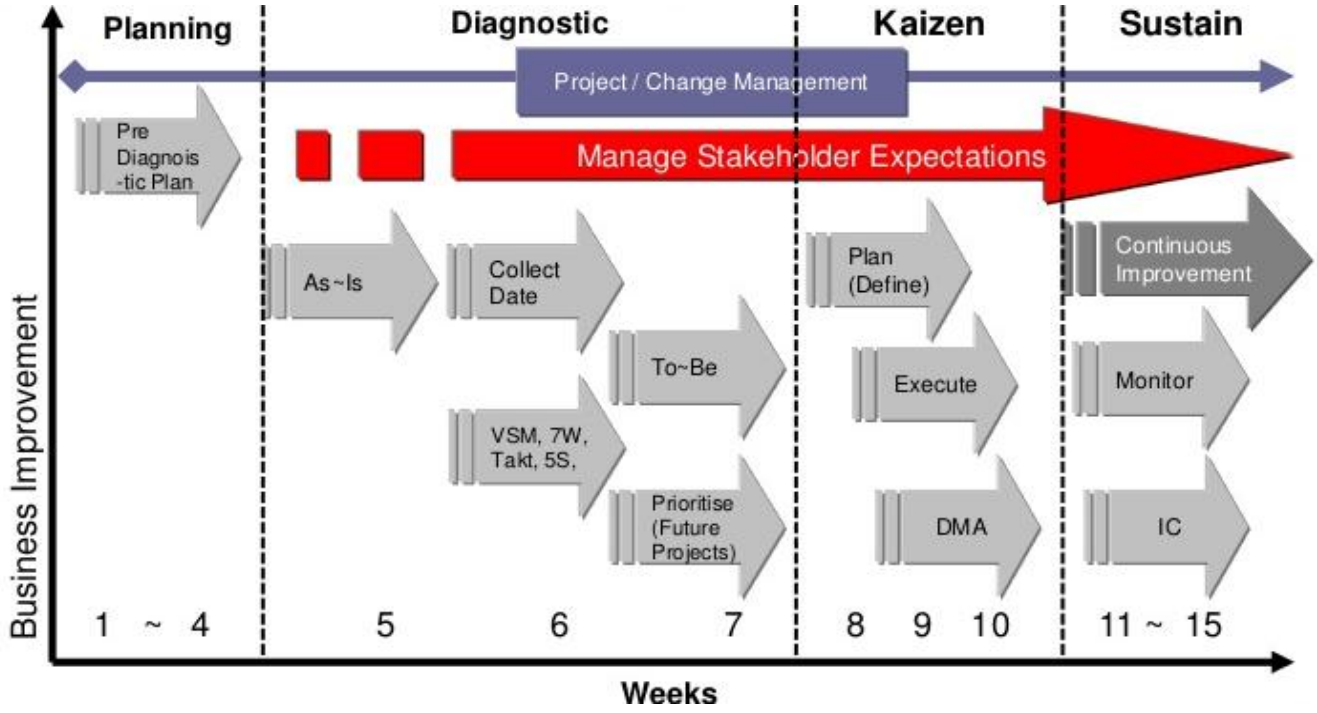
Effective teamwork, Direction and control and Leader ship development. The three pillars have four sub tasks under each. This model has bigger scope than the above mentioned two models.

The Fourth Kaizen road map model Considered in this study is **the kaizen Event- Blitze (kaikaku**) Developed by ANAND SUBRAMANIAN, on February 26, 2010. This road map model considered the following elements [33]

- Standard operation.
- 5S.
- Kaizen methodology.
- Discover problem.
- Measure and analyze the current work process
- Brain storming solutions and formulate process improvements.
- Create and map new process.
- Apply rapid implemntation.
- Establish new standard process.
- Operate using the new standard process.
- Monitor and control.

- Present result and celebrate.

Figure 2:- Kaizen Roadmap diagram developed by the kaizen event.



http://www.slideshare.net/anadsubramaniam/kaizen-events-blitz-kaikaku-lean-projects

As clearly seen in the above road map time for implementation has given considerable value. An overall master plan should be developed to include the time frame estimated to change the entire factory to the full incorporation of Lean throughout. Without such planning there is absolutely nothing to ensure a solid management commitment regarding the extent and cost of such a venture. Conversely there is nothing for management to use to track the stated mission. [20]

This roadmap model is selected better model than others because most kaizen implemented companies follow almost the same kind of road map in Ethiopia.

2.7 Kaizen Transferability

On transferability of *kaizen* across cultures, there are views that question the general applicability of *kaizen* to developing countries. They argue that most developing countries face the problem of weak human resources. Continuous improvement requires a seamless extension of training and skills development to the entire workforce… Short-feminism, the lack of upward mobility, and inattention to details of the workers in general may also add to difficulties in implementation of *kaizen*. Furthermore, in societies where the hierarchical structure is deeply rooted, it may not be easy to introduce a participatory mechanism in which all workers are encouraged to contribute actively to process and product improvements. [24]

Different scholars studied the contributing factors that help the transformation of kaizen to companies.

Hofestede was one of the scholars who studied the transformation of kaizen including ETHIOPIA. This was the reason preferably selected in this study.

According Hofestede's study there are six factors that affects transformation of kaizen;

- The factor of *Power Distance*: Power distance influences the hierarchy level, centralization degree and employees' participation in decision making. High power centralization is considered to be one main barrier for Kaizen transfer.
- The factor of *Organization Structure:* the structure of organization can also influence the effectiveness of team-work, cross-function communication and cooperation which are regarded as positive elements for Kaizen success.
- The factor of *Employment System*: a few findings proved that long-term or lifetime employment instead of short term and temporary contracts ensures employees' commitment to the company.
- The factor of *Pay & Performance Management*: a well-structured pay and performance management system is necessary to encourage employees to participate in Kaizen continuously and their contribution to Kaizen could be linked with the compensation and personnel performance review (Brunet and New, 2003).

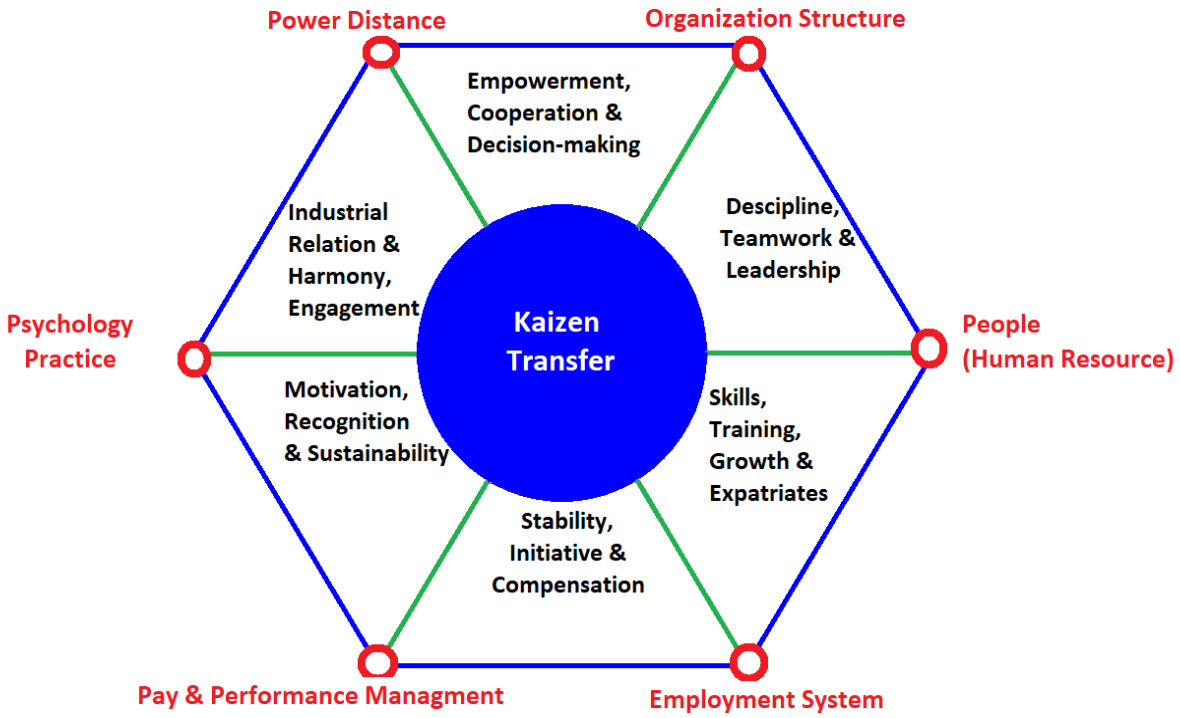
Performance review significantly impacts on workers' attitude and commitment towards Kaizen events (Glover 2010).

- The factor of *Psychology Practice*: it is about applying organizational psychology to manage employee relations and catalyze the process of Kaizen transfer and implementation in a different culture.

Based on literature findings and personal observations from Kaizen practices in 6 factories in Asia, Hofstede developed conceptual framework of Kaizen Transfer Model.

The six interactive factors in the model, namely the Power Distance, Organization Structure, People (Human Resources), Employment System, Pay & Performance Management, and Psychology Practice are also some cross subsets between each two neighboring factors. For example, the joint influence of Power Distance and Organization Structure will impact companies on employees' empowerment, team cooperation and complexity of decision-making. In a same way, the Employment System and Pay and Performance Management will together influence company compensation structure, employees' self-initiatives and stability.

Figur 3:- Hofsteds'kaizen transferebility model.



source;- *http://www.researchgate.net/ publication/304381511, conference paper; May 2016*

2.8 Resource planning

In kaizen implementation allocation of resource is one of the necessary requirements. Hence top management needs to allocate budget for the execution of kaizen program. A budget for Kaizen should not be thrown into an overall training account or hidden within the confines of a standard budgeted line item. It should stand entirely on its own merits and be reviewed accordingly. The major reason is to keep the attention level high and to ensure Kaizen doesn't fall short of its intended quest. Otherwise there is absolutely no way of knowing for certain if it is being actively and aggressively pursued as intended. The budget for Kaizen should represent the intent of a "Master Kaizen Plan" prepared by the Lean coordinator and approved by management... [20]

2.9 Training

Any manufacturing operation that is truly serious about kaizen should insist that every employee be exposed to Kaizen training which helps the entire workforce understand the importance of waste reduction activity and how the mechanics behind the process of Kaizen can apply to any job, whether it is on the shop floor or in the office. The scope of

Kaizen training should involve all employees. Ideally, each and every member of the workforce would be required to attend and participate in at least one Kaizen event. The idea, of course, is to provide everyone with firsthand knowledge and experience in the process. [20]

2.10 5s Implemntation

Kaizen philosophy sits on three pillars for successful implementation; these are housekeeping, waste elimination and standardization (Thessaloniki, 2006).

On the other side the word “five pillars” are used to overview the five S’s, by Hiroyuki Hirano, as a metaphor to mean one of a group of structural element which together support a structural system. The five pillars are defined as Sort, Set in order, Shine, Standardize, and sustain. Because these words are beginning with S they also referred to as 5S. The two most important elements are Sort and Set in order. The success of improvement activities depends upon them. The five pillars are the foundation for improvement activities. Sort and set in order are in fact the foundation for achieving zero defects, cost reductions, safety improvements, and zero accidents. [6]

The five steps of housekeeping, with their Japanese names, are as follows:- Seiri: Distinguishing between necessary and unnecessary items in the gemba, and discard the latter; Seiton: Arrange all items remaining after seiri in an orderly manner; Seiso: keep machines and working environment clean; Seiketsu: Extend the concept of cleanliness to oneself, and continuously practice the preceding three steps; Shitsuke: build self – discipline and make a habit of engaging in 5s by establishing standards. Sort means removing from the work place all items that are not needed for current production operation. Set in order means arranging needed items so that they are easy to use and labeling them so that they are easy to find and put away. Shine means sweeping floors, wiping off machinery, and generally making sure that everything in the factory stays clean. Standardize is the method for maintaining the first three pillars. Sustain means making a habit of properly maintaining correct procedures. [6]

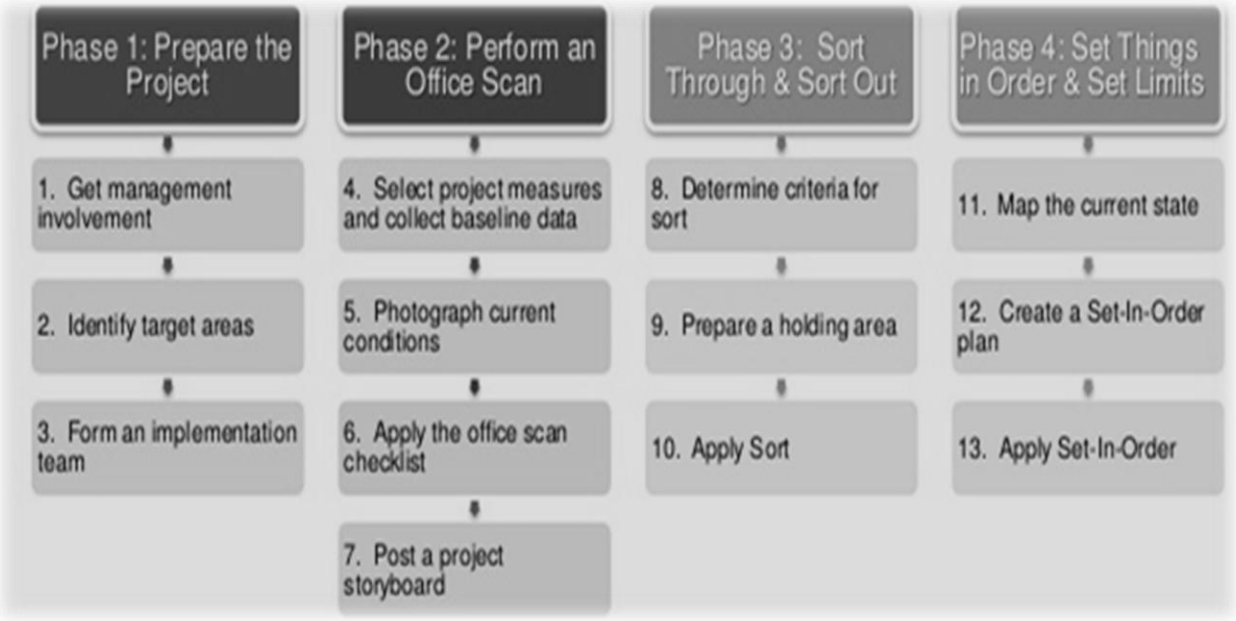
The description in the above statement can be summarized in the following diagram.

Table 2:- 5S summary table

5S	Japanese word	English Term	Action	Effect
1S	SEIRI	Sort	Identify and Eliminate all unnecessary items	Action
2S	SEITON	Set in order	Arrange necessary items in good order and easy access	
3S	SEISO	Shine	Clean your work place thoroughly	
4S	SEIKETSU	Standardize	Maintain high standards of housekeeping and workplace organization at all items	Culture
5S	SHITSUKE	Sustain/ Self discipline	Create a culture wherein all members practice the above 4S as a way of life	Habit

Source: - Mugher cement kaizen training material.

Figure 4:- 5S Implementation Roadmap



http://www.slideshare.net/oeconsulting/office-kaizen-by-oprational-excellence-consulting.

This diagram is selected among others for the reason that 5s implementation process was done using the same steps in our country.

Weather it is kaizen or any other change management, before implementation began the company understand where it is at the moment (by assessing situations) and has to aspire where it need to be within specific time period.

2.11 Management tasks to get kaizen project effective.

1. Convince everyone that Kaizen is a culture and not some kind of process, tool, or framework.
2. Start to communicate the message that management team are all on board in the Kaizen process, and will stop any finger-pointing or blame games when talking about problems.
3. Design and maintain a constant change management project. In order to do that, learning about change and constantly review the change management frameworks, updating and adapting them to the current reality of the company culture. Encourage people to get out of their comfort zones and celebrate learning.
4. Constantly inject energy into the Kaizen process. Create atmosphere that everybody observes the Kaizen events and that there is enough structured and protected time for learning, research, innovation, and personal development. Provide people with training, support, literature, and mentorship. Celebrate all improvements.
5. Make sure that everyone is included in the Kaizen plan.
6. Create ground for Long-term vision for Kaizen initiative.
7. Coach teams in identifying problems and impediments and teach them how to divide those problems into smaller ones and to prioritize them according to their impact on the team and the ability to cope with them.
8. See to the root causes by introducing techniques and tools and constantly communicate the need to get rid of defect sources forever instead of just fixing defects.
9. Update the Kaizen plan regularly and make sure that improvement goals and Desired States are properly defined, and that key metrics are updated and communicated.
10. Make sure that the resources needed for improvement are made available to the teams, both in terms of time, skills, tools, budget, and material resources. **[1]**

2.12 Contributing factors for Kaizen Implementation

1. Top management commitment in having a clear corporate strategy, policies and goals (Road map) that can stimulate Kaizen culture in the organization.
2. The presence of a caliber Kaizen champion in an organization, the existence of proper organization structure.
3. Ad-hoc relationship and collective membership with a high degree of autonomy, self-discipline and openness tends to be successful as compared to a bureaucratic organization.
4. Active workers involvement, availability of resources, existence of cross-functional teams, and clear organization structure.
5. The existence of problem solving teams such as quality circles and cross functional group working together to implement Kaizen.[3]:-

2.13 Contributing Factors for kaizen implementation Failure.

1. Absence of a real culture. Existing and prevalent culture and processes can prevent Kaizen, especially if there is a culture of 'you cannot touch that', 'this is the way we've always done it', or 'this is not my/your duty'.
2. Blame games. This is a specific case of cultural conflict: managers are more concerned about 'hiding the garbage' and who is to be blamed for any problem or defect than actually engaging in a constructive debate on how to improve. There is no real management buy-in. Sometimes it even takes the form of passive-aggressive behaviors—managers will swear they are into the Kaizen transformation, but then will undermine it. There is usually no transparency and there is a fear of communicating and making information available to everyone.
3. Resistance to change. People just refuse to change because any change, especially a big one, as in a Kaizen initiative implies moving out of their comfort zone. By default, unless there is a strong reason people won't understand the need to run the extra mile or engage in the improvement process.
4. Lack of momentum. There is one big-bang improvement event, training course, or communication campaign, but then there is no follow-up. People are told to improve,

but then there is not enough communication, no visibility, no champions, no quick wins, no training, and no support.

5. No sense of ownership/no empowerment. Not everyone is involved in the Kaizen initiative - maybe just some managers or some management-appointed Kaizen roles, which will be seen as the 'folks responsible for Kaizen'. People will feel that Kaizen is just another burden thrown at them.
6. Short-term vision. Kaizen is seen as a short-term project with an end date.
7. Failure to identify problems. Sometimes, a people fail to prioritize their problem, and sometimes they try for very important-but difficult to solve-problems instead of going for the 'low hanging fruit' and creating quick-wins to encourage the improvement initiative.
8. Failure to see root causes. We just apply shortcuts and workarounds, but the real problem causes are hidden and are never solved. Problems are repetitive-the focus is on short-term solutions instead of investing enough time to understand all the causal relations and all the implied factors.
9. Failure to plan and execute. There is no PDCA system in place.
10. Lack of resources. Not necessarily in the sense of physical resources: sometimes there is just not enough time nor skills to approach Kaizen in a productive way.
11. Weak planning: the team will prepare some action plan, but the plan will be weak. Usually they will use statements as 'we are going to solve this', 'we are going to work smarter' or 'we will put some effort on it', but then there will be no clue on who, what, when, or how.
12. Leader talks: the coach or -even worse- some manager will make all the iteration analysis, problem diagnosis, impediment identification, and solution proposal. The team will not feel empowered, nor will they feel any ownership in the improvement process.
13. Few people talk: a variation of the previous type of failure. In this case a few people participate, but some will always lag behind or just be idle.
14. Artificial harmony: the team's fear of conflict makes them hide real problems.
15. Bad feeling: Retrospectives are seen as uncomfortable events because all the talk is about failures, defects, problems, and things we did wrong. **[1]**

2.14 Change management evaluation

Kaizen implementation project is one of change management project. As any new process a period of disruption created during the implementation of a new process or procedure is a delicate time for any business. Employees need time to adjust to the new way of doing things, and holdovers from the old methods bleed over into the new. Change management systems mitigate the negative effects that arise during the disruption period, and allow companies to accomplish changes more efficiently. (38)

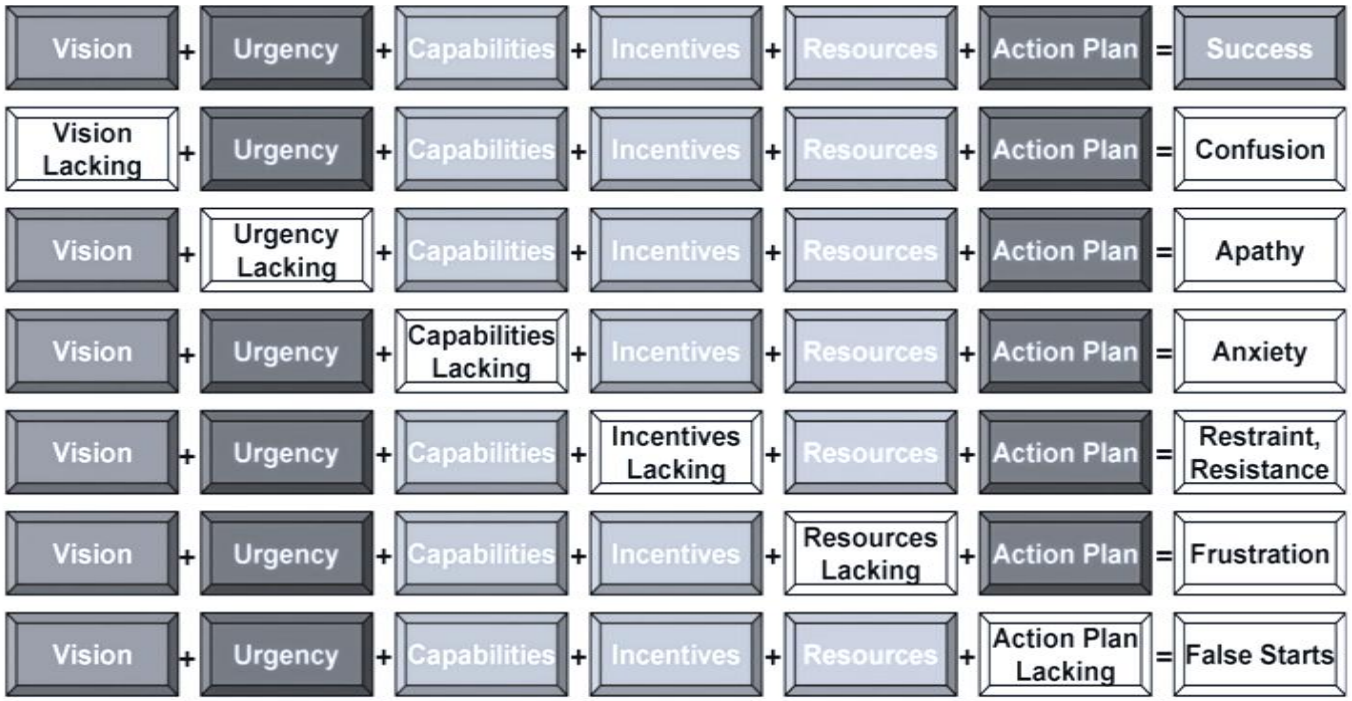
Different models can be used to implement change management system to smooth the transition with a structured approach that encourages employees to buy in to the changes. The same models can be used to measure the extent of the success of the change management.

From well known models the following can be mentioned:-

- Lewin Model:-Designed by Kurt Lewin in the 1950s, the Lewin model remains incredibly popular because of its simplicity. The Lewin model is a three-step process that he labeled the Unfreeze, Change, and Refreeze phases. [12]
- Kotter's Model: - The leading challenger to the Lewin model was developed by John P. Kotter, Harvard professor and change management theorist. He developed an eight-stage model. [13]
- McKinsey 7-S Framework: - In the 1980s, McKinsey & Company reinvigorated change management models with the creation of the 7-S Framework. This describes the seven stages through which a company must progress when implementing a set of changes. [14]
- ADKAR Model:-ADKAR model recognizes the need for small, incremental changes over time. Managers measure success in the ADKAR model by the impact of cumulative goals and the sequence of progression for the duration of the model. Changes are orderly and moderate, so employees have a chance to adapt before the next wave of changes strikes.[15]

On top of the above mentioned models other model can also be looked in. For the sack of this study the balanced score card institute model developed in 2006 found more convenient for its simplicity and incorporating many qualitative factors that can relate directly to kaizen implementation.

Figure 5:- kaizen project success evaluation diagram.



Source:-Balanced score card work book tenth edition 2009; the balanced score card institute; strategy management group. Cary; north Carolina & Washington, DC USA

2.15 Proposed hypothetical model for kaizen Implementation

As a change management kaizen implementation requires strong management commitment. Commitment can be expressed through a number of ways; proper planning, resource allocation, follow up, analyzing and evaluation of reports, taking corrective actions.

Change management needs owner, sometimes referred as internal consultant, that follows the day to day activates of the imlementation process. It also acts as facilitator and trainer to smooth up the transition of the implementation.

The following proposed diagram is established as ideal diagram that can help in implementation of kaizen comprising most necessary tasks in respect of management structure.

When we think, initially, to introduce kaizen to our company we have to conceder a number of affecting elements. One of these elements could be its transferability. As any change management kaizen transferability to a company is affected by such factors as power distance between management and workers, kind of structure the company adopted, the level integration of pay system with performance achieved, psychology and work culture existed are factors that needs consideration.

Values, techniques, principles and significance of kaizen implementation need to communicate well throughout the company. Steps of implementation starting from planning to evaluation needs to train in depth at all level. PDCA principles should be in place to know and follow the progress of the project. The role and responsibilities of every layer of the structure of the company should be well defined. Hindering and supportive factors of the project should be understood clearly from start.

The role and responsibilities of every layer of management defined clearly; stressing on such areas as working strongly on capacity building for the implementation, resource allocation, assigning internal work unit that can work deductively on kaizen implementation, conducting regular communication, motivating best achievements are some of the critical tasks of the management.

Comprising all this factors with in single model the following diagram is proposed as hypothetical model for the implementation of kaizen project.

Table 3:- Kaizen implementation model

	Key responsibility in Kaizen Implementation				
Plant Manager	Initiate new changes Make Annual Kaizen Strategy plan ,	Provide Resources to Implement	Lead Weekly Kaizen Steering Committee for follow up.	Performance Control Based on the plan. Initiate reward and recognition system	Report major activities and achievements to Board of directors
Department Manager / **Section Manager**	Deploy Annual Kaizen Strategy	Organize Resources to Implement plan	Participate on weekly Kaizen steering Committee meeting. Implement recognition and reward events	Performance control Based on plan; Participate on improvement Kaizen Projects	Report sub detail activities to plant manager
Supervisors/ shift leaders	Lead Kaizen workshop	Lead Daily Kaizen Meeting.	Coordinate and Implement Action plan. Initiate recognition events	Performance Control Based on key performance indicators	Report detail activities to department managers
Operators and shop floor workers	Participate Kaizen workshop or events	Participate Daily Kaizen Meeting	Follow Standards and perform kaizen tasks. Set and act for high target.	Participate on suggestion system, using kaizen board.	Report detail activities to supervisor
Kaizen support Manager /internal consultant/	Make a promotion and support master plan Support managers in process	Coordinate external consultants support Provide and train internal consultants	Implement the kaizen promotion strategy (policy news paper, meeting, Kaizen room)	Organized audit, organize training principles& values, techniques Reward performance	Report detail activities, progresses and problems to the plant manager
Kaizen support Staff.	Support managers in kaizen workshop and event	Design and coordinate special projects (like suggestion system)	Develop seminars, case study, and workshop, visits.	Make audit. Develop training program including on principle & values, techniques of kaizen	Report detail activities to kaizen support manager

CHAPTER THREE

Research Methodology

3.1 Introduction

Within this chapter the study describes the steps and approaches that were used and employed in executing the research. It incorporates the research design, primary and secondary data collection, population under study, instruments and the data analysis methods were fairly highlighted.

3.2 Research design

According to Yin (2002), research design is described as action plan where the initial sets of questions to be answered are addressed in a way of arriving at conclusions on these questions. The five components that are considered important for a research design are: a study's questions; its proposition, its analysis; the logic linking of the data to the propositions; and the criteria for interpreting the findings.

Descriptive research has used for the study. In order to assess the present situation of the case company Questioner was administered, discussion with selected the management team members was held; extensive observation work areas was done, watching behavior of the respondent was conducted, mainly to determine factors that contributed for the success of kaizen implementation and the challenges encountered.

Qualitative and quantitative factors were brought in to view and compared with KPI of the company. Visit of website, research done on related title, especially research papers worked after 2010, has fairly assessed. Magazines, books written on kaizen, and some of material Ethiopian kaizen Institute were also revised.

Since the research started from general and ends with specific case of case company; deductive research design has employed.

3.3 Controlling Research Design Quality

The quality of any research design can be accounted for according to certain parameters. According to Arbnor and Bjerke (1997), Mitchell and Jolley (2001), Patton (2002) and Yin (2002), the following are the important aspects to consider.

The first one is: Validity, which is defined as the extent to which the results are true or correct and are representatives of reality. There are three different types of validity (ibid):

- Construct validity: This takes care of establishing correct operational measures for the concepts being studied, for example, accuracy of names of measures applied and the standardized manner of measuring according to prescribed procedures.
- Internal validity: This one attempts to ensure that there is logical relationship (relevance) between a study and the existing theory in the area.
- External validity: This type of validity ensures the possibility of generalizing the results beyond the actual case being studied.
- Face validity: is the assessment of the degree of acceptance of the results by the public at large.

The other aspect, reliability, targets to minimize the errors and biases in the study by assessing the process of data collection procedures so as to ensure that the same findings and conclusions can be arrived at if the research is repeated (Yin, 2002).

The systematic way of ensuring that the above two aspects of research are addressed in a research can be accounted for by the following strategies (Patton (2002), Arbnor and Bjerke (1997) and Yin (2002)).

- Rigorous techniques and methods for gathering high-quality data,
- Careful analysis of data with attention to issues of validity, reliability and triangulation.
- The credibility of the researcher with respect to training, experience, methodological skill, competence, sensitivity, and the resilience of the person conducting the research.

This research attempts to ensure for the validity and reliability of the study by making sure that the following general aspects are given due attention:-

- Appropriate methodology has been employed.
- Suitable sample method, which can well represent the population, has used.
- Respondents left free to give their opinion without any pressure.
- Enough time has given to respondents on answering the questioner and on team discussion.
- Time has taken to collect current data that can show the real situation of the case company, with appropriate unit of measurement.

3.4 Population and Sampling

The scope of this research is limited to the mother plant of Mugher cement factory. Therefore the analysis has targeted to departments found there. Namely Raw material preparation and supply Department, Clinker production Department, Cement production Department, Engineering Department, Quality control and product development service, Human Resource Department, Finance unit and Marketing Unit.

Based on the width of work area and nature time of work (i.e. Normal working hours work, two shift work and three shift work) the kaizen Team was organized with in every department. The Kaizen members within each kaizen team ranges from 3 to 10.

The sampling of size framed based on the number of the kaizen team. Judgment and convenient sampling method was employed for this study. With this method one team member from each kaizen team has been contacted and target to cover 70% of the kaizen team.

Table 4:- kaizen team number

Kaizen Team Number in each Departments in year 2017/18		
SN	**Department**	**Number of kaizen Team within the Department**
1	Raw material preparation and supply	**13**
2	Clinker production	**19**
3	Cement production	14
4	Engineering	31
5	Quality control & product development	7
6	Human Resource	6
7	IT & system Development	2
8	Health service	2
9	Marketing	5
10	Finance	1
Total		**100**

Source: - Mugher Cement Factory kaizen implemntation 9th month report; 2017/2018.

It is believed that such amount of sample can well represent the population.

3.5 Data collection methods and instrumentation

Questionnaires was developed and distributed to the selected team members of the factory, mainly which assumed to understand the question. From data collected from the respondents it has been found that the respondents' service year range from one to thirty two years, their education back ground ranges from high school to second degree. Professionally from clerical to managerial level.

Within questionnaire administered; Demographic questions, Dichotomous questions with 'Yes' and 'No' ; four-point Likert rating scale and open – ended questions ware included.

The date collection targeted also operations managers and of different level and their equivalents, which had considerable responsibility with Kaizen implementation and in operations of Mugher cement factory. On top of administered questioners considerable qualitative data has collected from discussion held with selected management team members.

Descriptive statistics was used for data analysis with Statistical Product and (SPSS) being used to aid the analysis. Pareto diagram, pie chat, bar charts, tables mean comparison are some the statistical tools that has employed.

CHAPTER FOUR

Data analysis, Results and Discussion

4.1 Introduction

This chapter presents data gathered and results of data analysis. As indicated earlier data are presented in tables, graphs, and discussion on the findings of the study.

The questioner administered has contained total of 67 questions under 7 units. From the 80 questionnaires distributed, 62 or 77.5% were answered by the respondents and were used for the analysis.

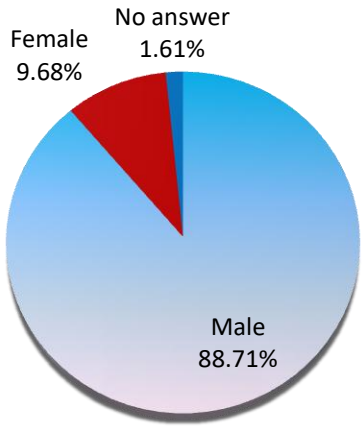
4.2 Presentation of Data

1. **Workers and managements participated in answering the questioner.**

Table5:- respondent Gender

S.N	Gender	Number of Respondent	IN %
1	Male	55	*88.71*
2	Female	6	*9.68*
3	No answer	1	*1.61*

Figure 6:- Respondent Gender in pie chart:



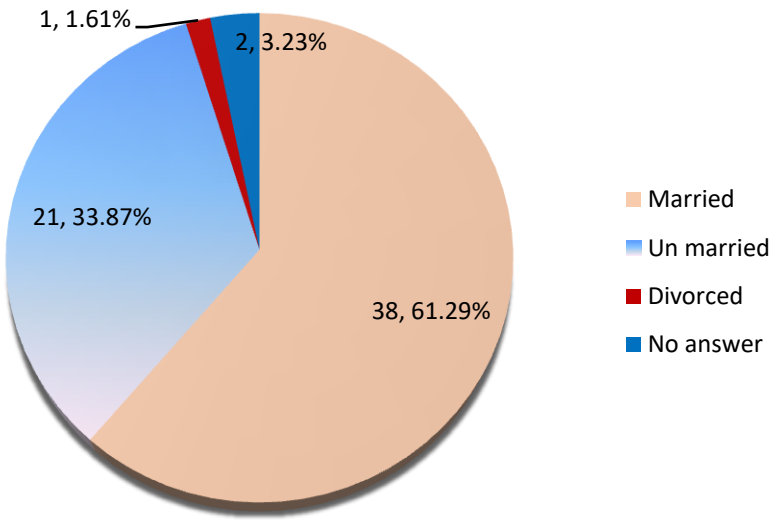
The total number of respondents are 62.Out of this 55or 88.71%are male; 6 or 9.68% are female. One respondent which is 1.61% didn't answer at all.

2. Respondents marital status;

Table 6:- Respondents marital status.

Marital status	Number of Respondent employee	In %
Married	38	*61.29*
Un married	21	*33.87*
Divorced	1	*1.61*
No answer	2	*3.23*

Figure 7:- Respondents marital status pie chart



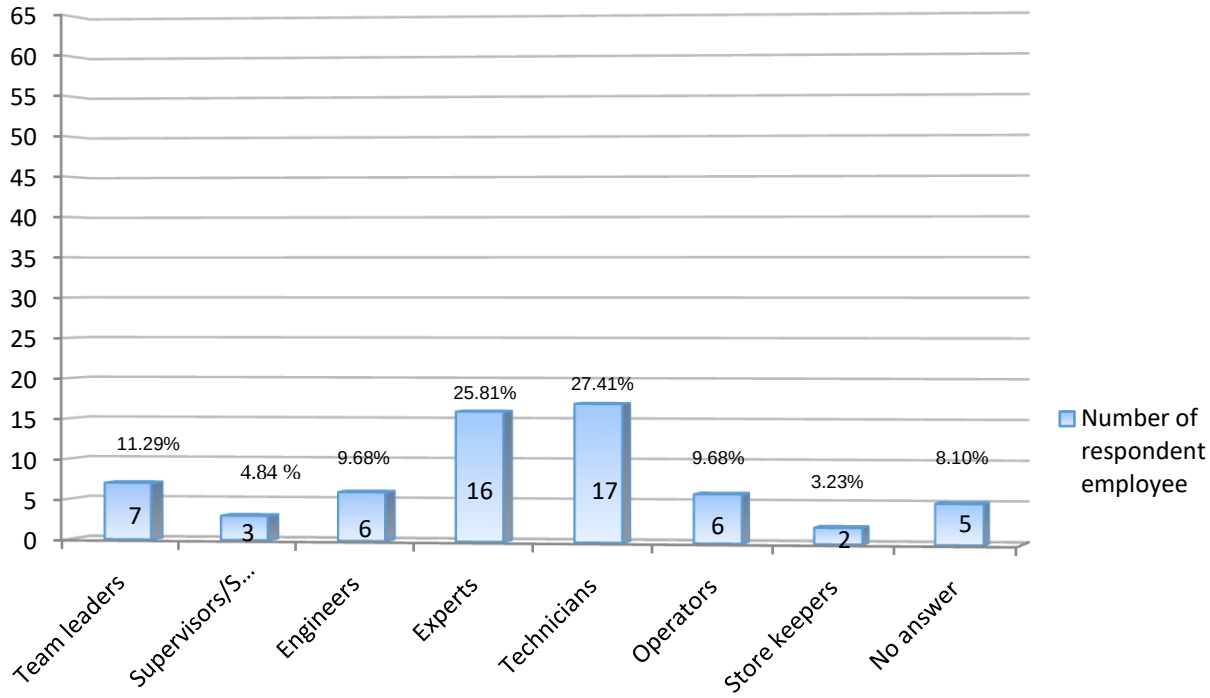
From the total of 62 respondents 38 (61.29%) were married; 21 (33.87%) unmarried; 1 (1.61%) didn't answer at all.

3. The respondents' current position in the company.

Table 7:- Profession of the respondents.

SN	Position /occupation in the company	Number of employee	In %
1	Team leaders	7	*11.29 %*
2	Supervisors/Shift Leaders	3	*4.84 %*
3	Engineers	6	*9.68 %*
4	Experts	16	*25.81 %*
5	Technicians	17	*27.41 %*
6	Operators	6	*9.68 %*
7	Store keepers	2	*3.23 %*
8	No answer	5	*8.10 %*
9	Total	62	*100 %*

Figure 8:- Respondents current position in company



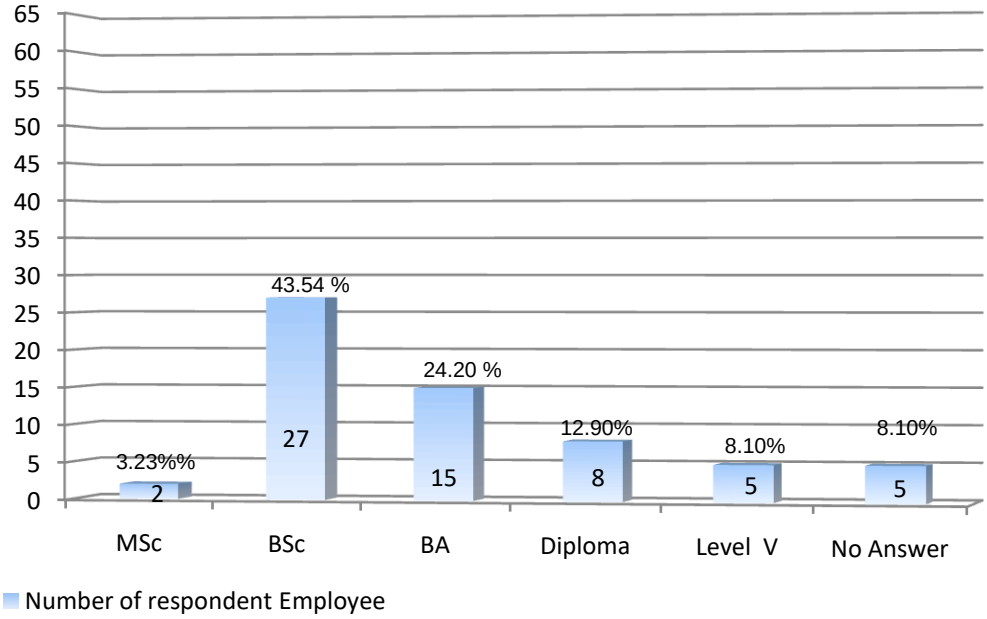
From total number of respondents experts and technicians accounted for 53.22%. These are more of front line workers or direct implementers. Team leaders 11.29%, engineers and operators 9.68% each; supervisors and sore keeper accounts for 4.84% and 3.23% respectively.8.10% didn't respond.

4. **Educational level/ profession of the respondent**.

Table 8:- Education level of the respondents

SN	Education Level	Number of Employee	In %
1.	MSc	2	*3.23 %*
2.	BSc	27	*43.54 %*
3.	BA	15	*24.20 %*
4.	Diploma	8	*12.90 %*
5.	Level V	5	*8.10 %*
6.	No Answer	5	*8.10 %*
7.	Total	62	*100 %*

Figure 9:- profession of the respondents



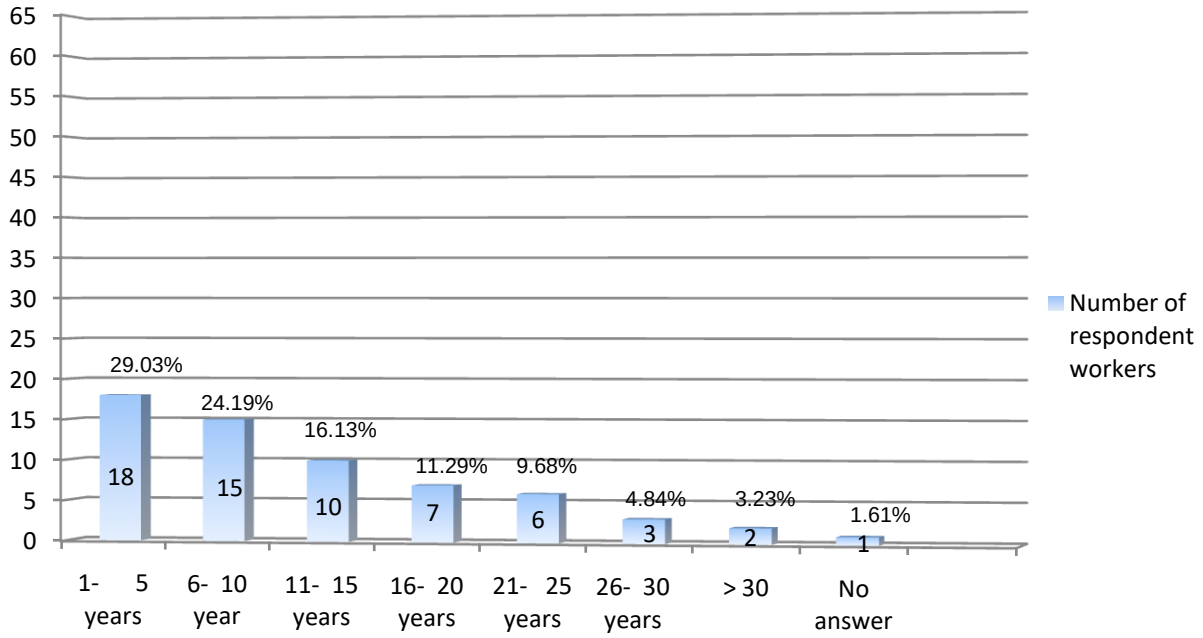
The diagram portrays that significant number of well educated expertise were participated in answering the questionnaire. BSc, BA, and MSc holders accounted for 70.97%. Workers of middle education level shares 21%. Out of total 8.10% didn't respond at all.

5. **Respondents' service year in the Mugher cement factory.**

Table 9:- Service year of the respondent

S.N	Service year interval	Number of workers	In%
1	1- 5 years	18	*29.03*
2	6- 10 year	15	*24.19*
3	11- 15 years	10	*16.13*
4	16- 20 years	7	*11.29*
5	21- 25 years	6	*9.68*
6	26- 30 years	3	*4.84*
7	> 30	2	*3.23*
8	No answer	1	*1.61*
	Total	62	*100*

Figure 10:- respondents service year



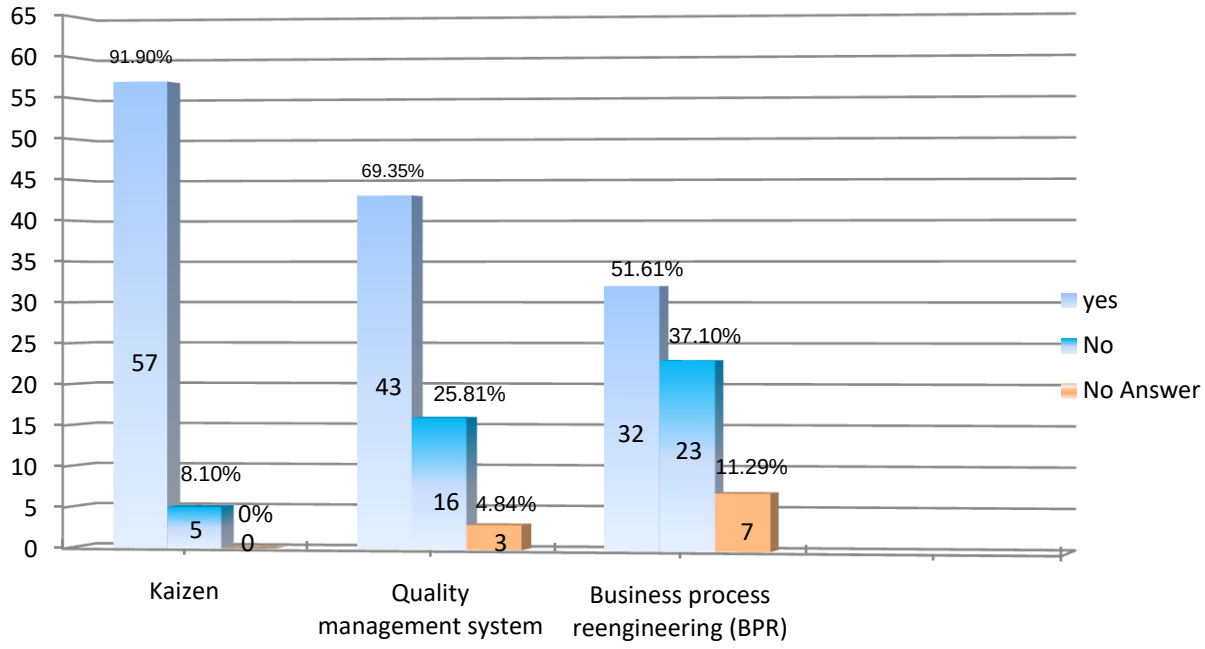
The above diagram displays the respondents service year by five years interval. Most of the respondents, 53.22%, have less than ten years service time within the factory. In respect to data presented on the next two diagrams, the probability of acquiring kaizen knowledge was seems less on late comers, 1-5 year experienced workers. As service year increases the workers participation on kaizen training and implementation found better.

6. Kaizen knowledge the respondents have in relation other management tools/ systems the factory implemented within the last ten years.

Table 10:- Respondents kaizen knowledge

SN		Yes		No		No Answer		Total
		In NO	In %	In No	In %	In No	In %	
1	Kaizen	57	*91.90*	5	*8.10*	0	-	62
2	Quality management system	43	*69.35*	16	*25.81*	3	*4.84*	62
3	Business process reengineering (BPR)	32	*51.61*	23	*37.10*	7	*11.29*	62

Figure 11:- kaizen knowledge of the respondents.



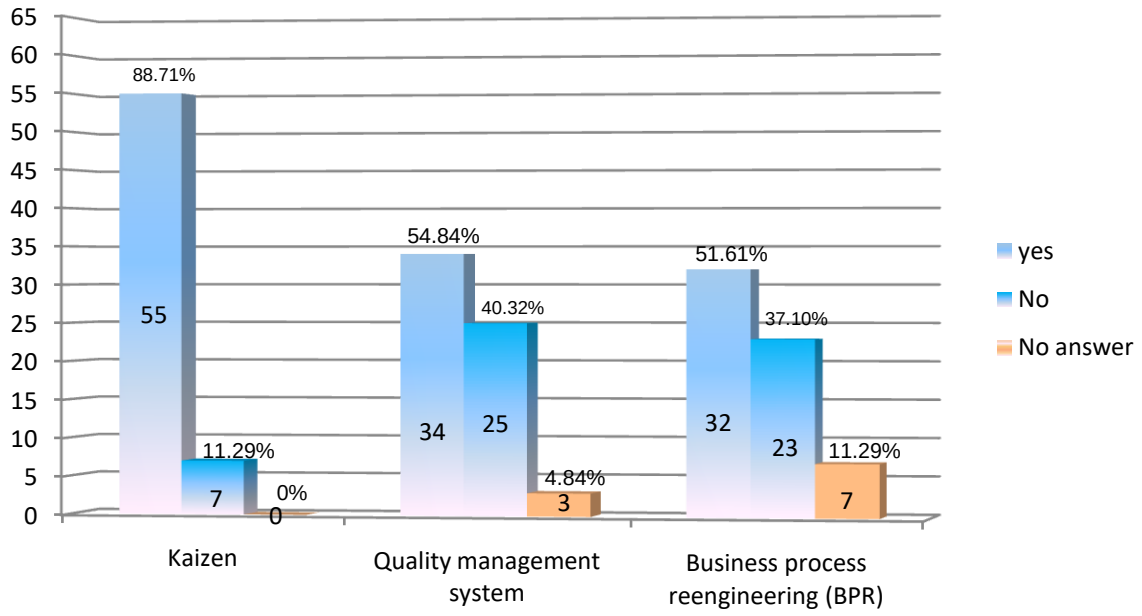
The diagram displays the extent of implementation of kaizen in relation to other management tools implemented within the company in last ten years. Accordingly for kaizen implementation respondents answered "yes" accounted 91.9%; "No" 8.10%; In respect of Quality management implementation respondents answered "yes" accounted 69.35%, "No" 25.81%, and no answer 4.84%. In respect of BPR respondents answered "yes" accounted 51.61%, "No" 37.10%, and no answer 11.29%.This indicate that kaizen has well implemented In MCF than other tools.

7. The extent of participation in Kaizen within the last 3-5 years with respect to other management tools/ systems the factory used to implement.

Table 11:- Extent of kaizen implementation within past 3-5 years.

SN		**yes**		**No**		**No answer**		**Total**
		In No.	In %	In No.	In %	In No.	In %	
1	Kaizen	55	*88.71*	7	*11.29*	0	-	62
2	Quality management system	34	*54.84*	25	*40.32*	3	*4.84*	62
3	Business process reengineering (BPR)	32	*51.61*	23	*37.1*	7	*11.29*	62

Figure 12:- Extent of kaizen implementation within past 3-5 years.



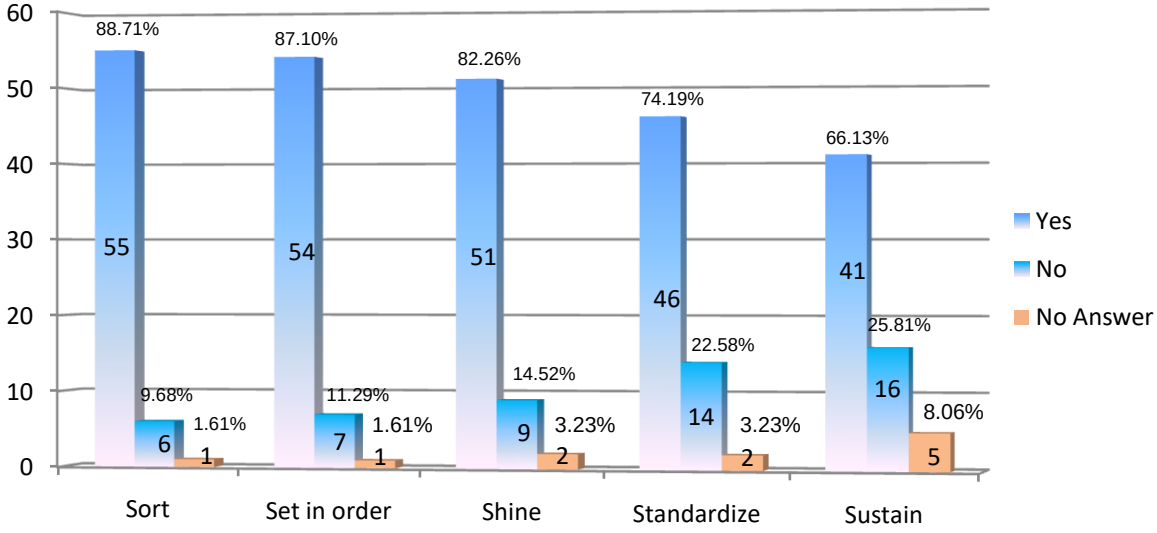
The diagram displays the extent of workers participation to kaizen in relation to other management tools implemented within the company in last 3-5 years. Accordingly in respect of participation to kaizen respondents answered “yes” accounted 88.71%; “No” 7%; In respect of Quality management implementation respondents answered “yes” accounted 54.84%, “No” 40.32%, and no answer 4.84%. In respect of BPR respondents answered “yes” accounted 51.61%, “No” 37.10%, and no answer 11.29%.This indicate that kaizen has well participation rate In MCF than other tools.

8. The level of awareness creation and the extent of 5s since the implementation of kaizen.

Table 12:- 5 s Implemntation.

SN	5S	Yes		No		No Answer		Total
		In No.	In %	In No.	In %	In No	In %	
1	Sort	55	*88.71*	6	*9.68*	1	*1.61*	62
2	Set in order	54	*87.10*	7	*11.29*	1	*1.61*	62
3	Shine	51	*82.26*	9	*14.52*	2	*3.23*	62
4	Standardize	46	*74.19*	14	*22.58*	2	*3.23*	62
5	Sustain	41	*66.13*	16	*25.81*	5	*8.06*	62

Figure 13:- 5S implementation.



The diagram displays the extent of implementation of 5S with in the case company. Sort, set in order and shine were practiced better than the remaining two. Sorting and set in order which accounted for 88.71%, 87.10% respectively practiced much better than others. Standardize and sustain accounted for 74.19% and 66.13% respectively. From literature it has observed that standardization and making sustain is more challenging than other three.

9. The extent implementation of the 7 waste (Muda) within the factory.

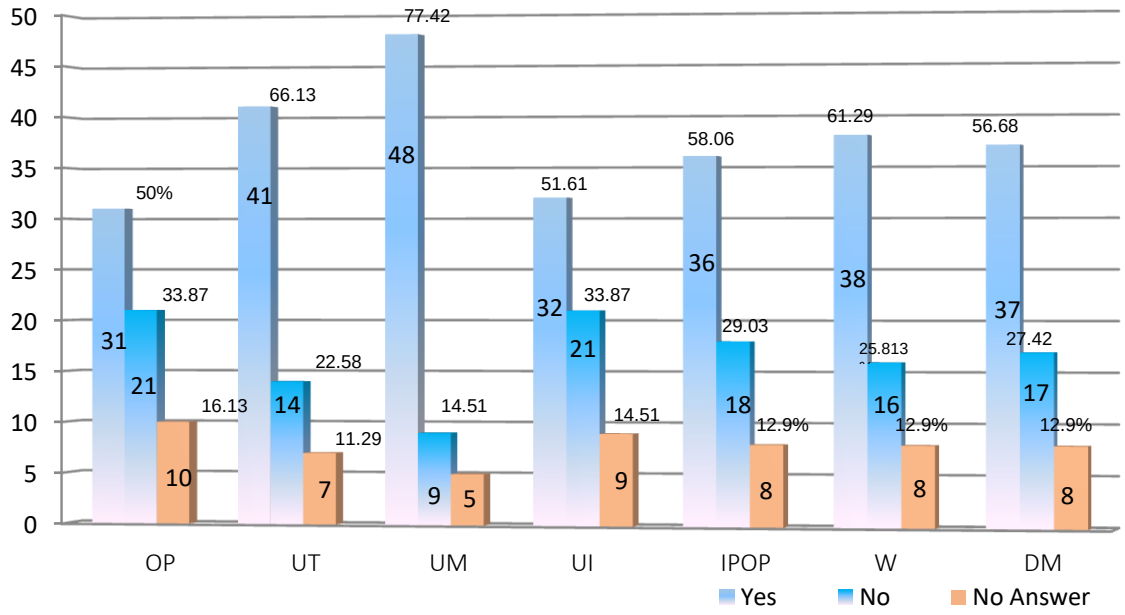
Table 13:- 7 west (Muda) elimination

SN	Types of the 7 wastes/Muda/	Yes		No		No Answer		Total
		In No	In %	In No	In%	In No	In%	
1	Over production	31	*50.00*	21	*33.87*	10	*16.13*	62
2	Unnecessary Transportation	41	*66.13*	14	*22.58*	7	*11.29*	62
3	Unnecessary motion	48	*77.42*	9	*14.51*	5	*8.06*	62
4	Unnecessary inventory	32	*51.61*	21	*33.87*	9	*14.51*	62
5	Inappropriate processing or over processing	36	*58.06*	18	*29.03*	8	*12.9*	62
6	Waiting	38	*61.29*	16	*25.81*	8	*12.9*	62
7	Defect making	37	*59.68*	17	*27.42*	8	*12.9*	62

Figure 7 west (Muda) elimination

Key

OP: Over production
UT: Unnecessary Transportation
UM: Unnecessary motion
UI: Unnecessary inventory
IPOP: Inappropriate processing or over processing
W: Waiting
DM: Defect making



The diagram shows that the extent of practice of elimination of the seven Mudas in MCF. Accordingly Respondents answered "yes" for Muda of unnecessary 77.42%, Muda of unnecessary transportation 66.13%, Muda of waiting 61.29%, Muda of defect making 56.68%, Muda of unnecessary inventory 51.61%, Muda of Over production50%. As the percentage set in order indicate the big figure shows good performance west elimination.

10. the extent of practice of Kaizen 14 principles (Toyota kaizen principles)

Table 14:- practice of 14 kaizen principles

SN		Yes		No		No Answer		Total
		In number	In %	In number	In %	In number	In %	
1	Making operational decision based on long term philosophy, even at expense of short term financial goals.	33	*53.23*	19	*30.65*	10	*16.13*	62
2	Developing experience of making production process work continous process flow / cutting back to zero the amount of time that workers are sitting idle.	33	*53.23*	19	*30.65*	10	*16.13*	62
3	Punting in place system for providing internal consumers, with the material what they went, when they went, and in the amount they went.	28	*45.16*	22	*35.48*	12	*19.35*	62
4	Workload leveling and Eliminate over burden to people, equipment and eliminate unevenness in the production schedule	29	*46.77*	23	*37.10*	10	*16.13*	62
5	Developing culture of stopping to fix problems soon as it appears, to get quality right the first time.	35	*56.45*	18	*29.03*	9	*14.52*	62
6	Standardizing tasks at operation process.	36	*58.06*	16	*25.81*	10	*16.13*	62
7	Using visual control at operation process so as to make no problems is not hidden.	26	*41.94*	23	*37.10*	13	*20.97*	62
8	Developing experience of using only reliable thoroughly tested technology.	37	*59.68*	15	*24.19*	10	*16.13*	62
9	Developing culture of growing leaders who thoroughly understand the work, Live the philosophy of the company, and teach it to others.	32	*51.61*	20	*32.26*	10	*16.13*	62
10	Developing exceptional people and teams who follow your company's philosophy.	29	*46.77*	20	*32.26*	13	*20.97*	62
11	Developing culture to respect extended network of partners and suppliers and helping them to improve their performance.	34	*54.84*	17	*27.42*	11	*17.74*	62
12	Existence of experience of visually seeing by oneself to thoroughly understand the situation.	37	*59.67*	14	*22.58*	11	*17.74*	62

13	Existence of system of making decision by consensus, thoroughly considering all option and implement rapidly.	32	*51.61*	19	*30.65*	11	*17.74*	62
14	Experience of making the company become a learning organization.	36	*58.06*	16	*25.81*	10	*16.13*	62

The above table shows the status of practice of Toyota fourteen principles within Mugher cement factory. As the company is on its early age since started implementing the tool; its practice was found to be fair on some tasks such as, experience of visually seeing by oneself to thoroughly understand the situation, making the company become a learning organization, Developing culture of growing leaders who thoroughly understand the work, Live the philosophy of the company, Developing experience of using only reliable thoroughly tested technology, Developing culture of stopping to fix problems soon as it appears, to get quality, Standardizing tasks at operation process.

11. Answer for the question whether the factory gains some advantage for the implementation of kaizen or not.

Table 15:- Advantage of kaizen implementation

		Yes		No		No Answer		Total
		In number	In %	In number	In %	In number	In %	
	Do you get advantage in Implementing Kaizen	48	77.42	7	11.29	7	11.29	62

12. **The extent of which benefit /additional facilities/ the factory gains from the implementation of kaizen**.

Table 16:- kaizen benefit

SN	Some of the benefit that can be gained in implementation of kaizen	Very good benefit /facility		good benefit /facility		satisfactory benefit /facility		no benefit /facility		No answer		Total
		In No.	In %	In No	In %	In No	In %	In No	In %	In No	In %	
1	Clean and attractive work place	29	*46.77*	21	*33.87*	3	*4.84*	3	*4.84*	6	*9.68*	62
2	Time saving for searching file, tool, spare part….	25	*40.32*	17	*27.42*	9	*14.52*	5	*8.06*	6	*9.68*	62
3	Cost saving	23	*37.10*	22	*35.48*	8	*12.90*	4	*6.45*	5	*8.06*	62
4	Increase efficiency	23	*37.10*	20	*32.26*	9	*14.52*	4	*6.45*	6	*9.68*	62
5	Work place accident and disease reduction	19	*30.65*	21	*33.87*	12	*19.35*	4	*6.45*	6	*9.68*	62
6	Data recoding improvement	20	*32.26*	18	*29.03*	11	*17.74*	6	*9.68*	7	*11.29*	62
7	Idea sharing among team members	24	*38.71*	21	*33.88*	8	*12.90*	4	*6.45*	5	*8.06*	62
8	Work with plan	25	*40.32*	16	*25.81*	10	*16.13*	5	*8.06*	6	*9.68*	62
9	Evaluation of performance with schedule	16	*25.81*	19	*30.65*	16	*25.81*	4	*6.45*	7	*11.29*	62
10	Achievement recognition	10	*16.13*	20	*32.26*	15	*24.19*	10	*16.13*	7	*11.29*	62
11	Overtime work reduction	13	*20.97*	20	*32.26*	14	*22.58*	8	*12.90*	7	*11.29*	62
12	Improve work scope (Doing more on new things)	15	*24.19*	22	*35.48*	13	*20.97*	6	*9.68*	6	*9.68*	62
13	Improve work culture	17	*27.42*	27	*43.55*	9	*14.52*	5	*8.06*	4	*6.45*	62
14	Helps for HR succession plan	14	*22.58*	19	*30.64*	13	*20.97*	7	*11.29*	9	*14.51*	62
15	Use of kaizen board / suggestion box/	22	*35.48*	19	*30.65*	8	*12.90*	7	*11.29*	6	*9.68*	62

In the above kaizen implementation benefit determination likert question answers, some performances has achieved better than others. To justify some: - In getting clean and attractive work place respondents answered “very good” and “good” accounted for 80.64%; On

cost saving respondents answered “very good” and “good” accounted for 69.36%; on work with plan respondents answered “very good” and “good” accounted for 66.13%; using kaizen board respondents answered “very good” and “good” accounted for 66.13%; the performance rate of others less much less than the indicated once.

13. The respondents answer for the common kaizen implementation challenge factors.

Table 17:- kaizen implementation challenges.

SN	Kaizen implementation challenge areas	yes		No		No answer		Total
		In No.	In %	In No.	In %	In No.	In %	
1	Lack of top management commitment	39	*62.90*	16	*25.81*	7	*11.29*	62
2	Lack of middle and lower level management	32	*51.61*	21	*33.87*	9	*14.52*	62
3	Misunderstanding of the concept or the tools	25	*40.32*	28	*45.16*	9	*14.52*	62
4	Lack of training	18	*29.03*	37	*59.68*	7	*11.29*	62
5	Absence of incentive	42	*67.74*	14	*22.58*	6	*9.68*	62
6	Lack of confidence on the kaizen tools for its continuity.	28	*45.16*	27	*43.55*	7	*11.29*	62
7	Taking long time on every single steps	25	*40.32*	28	*45.16*	9	*14.52*	62
8	Lack of resources	34	*54.84*	18	*29.03*	10	*16.13*	62
9	Absence of satisfactory result in implementation	30	*48.39*	24	*38.71*	8	*12.90*	62
10	Absence of recognition for excellent performance	45	*72.58*	10	*16.13*	7	*11.29*	62
11	Difficulty of valuing in to monetary term what has achieved	30	*48.39*	20	*32.26*	12	*19.35*	62
12	Irregularity of implementation between departments and within department units.	39	*62.90*	15	*24.19*	8	*12.90*	62
13	Problem in record keeping	36	*58.06*	17	*27.42*	9	*14.52*	62
14	Inconvenience of the work place to implement the system	29	*46.77*	23	*37.10*	10	*16.13*	62

The above table illustrates some of the challenge areas and its extent in kaizen implementation in Mugher cement factory. According to the magnitude of the figures Absence of incentive which is 76.74%; Absence of recognition for excellent performance which is 72.58%; lack of management commitment and irregularity of implementation which is 62.90% each; problem in record keeping which is 58.06% answered “yes”. This means that the indicated factors are among the major challenges that hindered the implementation of kaizen at MCF.

Kiln stoppage days (Total of the three kilns) per year

Table 18:- kiln stoppage time.

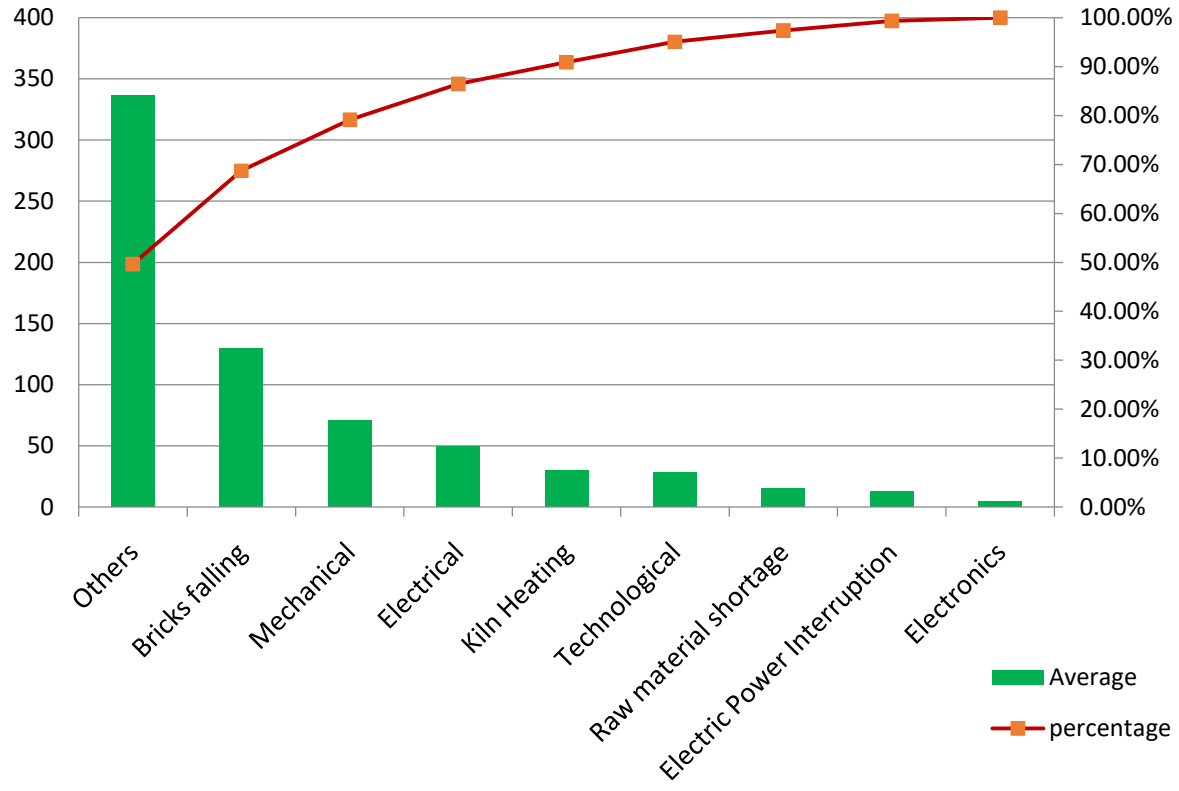
Reason for stoppage											
SN	Year	Others	Bricks falling	Mechanical	Electrical	Kiln Heating	Techno logical	Raw material shortage	Electric Power Interruption	Electronics	Total
1	2014/15	103.73	155.61	91.11	144.78	43.44	35.08	20.35	21.27	8.02	623.41
2	2015/16	404.71	188	99.47	13.58	30.18	15.31	17.3	15.52	2.02	786.06
3	2016/17	546.62	84.85	50.9	34.66	27.1	34.05	14.08	6.46	6.70	805.42
4	2017/18 *	291.50	89.25	40.14	5.19	20.40	29.28	9.46	9.47	0.63	495.33
5	Total	1346.56	517.71	281.62	198.21	121.12	113.72	61.19	52.72	17.37	2710.22
6	Average	336.64	129.43	70.40	49.55	30.28	28.43	15.3	13.18	4.34	677.6
7	%	49.68%	19.10%	10.39%	7.31%	4.47%	4.20%	2.26%	1.95%	0.64%	100%

The table shows the number of days the production line kilns has stopped due to the stated reasons.

It is four years data and the share of various factors for the stoppage of the production line has presented accordingly in mean and average terms.

*The fourth rear data is incorporate only 9 months of the fiscal year.

Figure 15:- Pareto diagram



Other problems Include: - Supply of spare prates, from foreign provider, suddenly damaged due to sudden power on off, Coal/ heavy fuel supply shortage, Security issues, Service water shortage, cooler cleaning, Knowledge gap of operators.

The above presented Pareto diagram describes about Mugher cement factory clinker production department. This department is selected for the following reasons:

- In cement industry the capacity and performance of a plant is measured by the amount of clinker it has produced.
- From the nature of cement factory 60% of the total production cost incurred at this unit.
- The availability machinery /operational time are critical for the company.
- Small improvement at this production unit amounts much in competitiveness or financial gain.

Organizational and kaizen structure alignment

In order to have a good view on how the kaizen teams are integrated and functioning in relation to the structure of the organization the following diagram has presented.

4.3 Discussion of Analysis and Findings

1 Inducing Values Principles and Techniques of Kaizen to Mugher Cement Factory.

- Mugher cement factory introduces kaizen since 2014/15 with close support of Ethiopian kaizen institute. Since kaizen is every day improvement which needs to involve top management, middle management and front line employee, the first task of Mugher was to conduct in company training. Under this program 52 Management staff, 1250 permanent and contract employee, 300 Outsourced work contractors/ piece rate workers were given kaizen training which lasts from 3-5 days in the first round. 102 management and workers Mugher cement factory has visited Wonji Showa, Mata Hara factories who had already implemented kaizen in 2014/15 (source 2014/15 annual company report)

- Within the training given the following topics has incorporated: - The purpose of kaizen, Kaizen guiding principles, Feature of kaizen, Goals of kaizen, Benefits of kaizen, PDCA cycle, Kaizen precondition, Kaizen strategy, Kaizen system, Kaizen methods, Tools of kaizen, Seven steps for kaizen, The seven west, Kaizen board (suggestion system), 5S principles and its implementation, how to find problem in operation, how to form kaizen team were areas of the training induced to the trainees. (Mugher cement kaizen training material, by Wendwossen Gizaw, March 2013)

- On the response given on questioner of this research On Table 4.4 /Figure 4.6 and Table 4.5/Figure 4.7, workers that have knowledge of kaizen and which participate on implementation was found 57 out of 62 which is 91.9 %, the other 5 out of 62 or 8.1% doesn't know about kaizen and has no involvement in its implantation.

2 Kaizen transferability to Mugher cement Factory

- As discussion held with the management team, Transferability of kaizen to Mugher cement was highly impacted by the failures of previously implemented and had ended with negative impact management tools. Especially the lesson of Business process reengineering was extremely negative among most of the management and workers. Secondly ISO 9001-2008 system was failed due to absence of commitment from the newly joined management group at the time.

- Employees who were hired for limited period of time were not motivated to participate on training of any management system improvement tools. They are worried about the termination of their employment than continuing with the company.
- As discussion held management team there is no pay performance management system that was linked with contribution to kaizen performance. In the collective agreement of Mugher cement incentive payment is related only to general performance of the company in respect to profitability and amount of sales achieved. Therefore this payment system has no direct linkage with kaizen performance.
- In the table 4.11 above Likert questioner , Mugher cement Achievement Recognition result show that 10/62 or 16.13% very good benefit; 20/62 or 32.26% good befit; 15/62or 24.19% satisfactory; 10/62 0r 16.13% not satisfactory; and 7/62 or 11.29% did not answer at all. The results signify that there is no as such good benefit for best achievements or contribution to kaizen.
- Secondly in Table 4.11 under the title of challenge of implementation of kaizen; on number 4 which inquire about the absence of incentive; 42/62 or 67.74% answers 'yes'. And 14/62 or 22.58% answer 'no'; 6/62 or 9.68% doesn't give any answer. In the same table on number 10 for the statement ''Absence of recognition for excellent performance'' 45/62 or 72.58% answers 'yes'; 10/62 or16.13% answers 'no'; 7/62or 11.29% doesn't give any answer. Respondents which answers 'Yes' clearly indicate that absence of incentive and payment system that links to good performance impact the of good result kaizen implementation.
- On management team discussion it has assured that there was no pay system in place that motivates kaizen best performers.
- Organizational structure of the company also has significant impact on the transferability of kaizen. Flat structure, which has not more than three layers, considered as more convenient than hierarchical structure in kaizen project implementation. Mugher cement organizational structure has four layers, as indicated on diagram in the appendix sis, has taken as moderate structure.

3 Kaizen significance

- The benefits Mugher cement factory gained from implementing kaizen is clearly indicated on the summary of the questioner administered. As indicated on table 4.9, by 77.42 %, likewise in table 4.7, in the field observation muda elimination has worked by significant amount. In table 4.7, however, respondents answers 'yes' was 50%. This is because of nature of Production Company. Cement manufacturing is continous and has no as such over production of products. There is an intermediate product that has stored for operational safe continuity. In table 4.10 in Likert questioner respondents answered very good and good for: - Clean and attractive work place 80.64%, Time saving 67.74%, Cost saving 72.58%, Increase efficiency 69%, Accident reduction 64.52%, Improve work culture 70.97%; in table in appendixes Mugher cement factory saved, yearly on average, Birr 55,989,137.5 within four year time since started implementing kaizen. Kaizen implementation contribute in developing human capability too; as indicated on table 4.8, kaizen helps in developing leaders, peoples and team who follow the company's philosophy, making the company learning organization 51.67% ,46% and58.06%, respectively.

4 Kaizen roadmap

- Beside the questioner administered, the company's strategic pan (2015-2020) and roadmap (2015-2025) studied by Adama science and technology university and yearly operational plan of 2015,2016,2017,2018 the company has looked in. Within this documents and discussion held by the management team there were no roadmap or corporate plan developed/ set for kaizen implementation. Kaizen training programs listed simply as any ordinary training schedules with other tasks within yearly training plan. No special attention has given for it.

The progress gained so far has achieved due to the PDCA exercised, to certain extent, by kaizen team at shop floor. 50-60% of front line kaizen teams tried to work by documented plan performance evaluation records.

"Kaizen without a target would resemble a trip without a destination. Kaizen is most effective when everybody works to achieve a target, and management should set the target" Gemba kaizen 2nd edition p 9

There was no proper plan for cost saving as well and there was no resource planning identically set for the implementation of kaizen.

Due to lack of proper planning Mugher doesn't identify at which area should start kaizen and allocate proper resources to gain better advantage from the project. This study has tried to indicate on figure 4.10 Pareto diagram the points of kaizen implementation that would have been targeted.

5 **Training**

- To implement kaizen with good knowledge one has to pass optimally 40 days of training. At any case it should not be less than 20 days. The training method should also prepared on case method. On top of that in training plan; logistics of training, selection of trainees, execution and review of the training has to be given due attention. (EKI kaizen manual, 2014). In case of Mugher cement factory, however, most of the management groups had attend three days of training, most front line workers has attend 5 days. And no as such updating training programs. Beside this there were a number of newly employed workers who didn't get any training. Even though their role is significant in production process 90% of out sourced work employees don't have any idea about kaizen.

6. 5S implemntation

- As indicated on table 4.5 5S was fairly implemented in Mugher cement factory; 88.71 % respondent answered "yes" for their participation to the program. And on table 5.3; 88.71% for sorting, 87.10% for set in order; 82.26% for shine; 74.19% for standardize; and 66.13% of sustain answered "yes". This all signifies 5S program has progressed well.

- "A luck of 5S in the Gemba should be considered a visual indicator of inefficiency, muda of insufficient self discipline, law moral, poor quality, high cost and an inability

to meet delivery time…these five points of housekeeping represent a starting point for any company that seeks to be recognized as a responsible manufacturer eligible for world-class status." Gemba kaizen 2nd Edition p 21

- The problem observed here was, the program of 5S especially sorting, set in order, shine didn't bind by time frame plan.

7 Change management evaluation;

- From the literature Mugher cement factory, reports and yearly magazines of Ethiopian kaizen institute it has been observed that deep kaizen implementation evaluation on Mugher cement factory kaizen program was made in year 2014/2015and 2015/2016 for national award contest. (source yearly company report) As a beginner of the project Mugher awarded trophy for its ranking 3rd in its field. The management of the company made light evaluation in combination with other performance just to know the activities of every department in respect to kaizen. There was no strong evaluation experience bases PDCA principle.

8 Management commitments

- In change management project management commitment can be expressed by setting clear vision for the project, preparing plan with detail break down, allocation of necessary resources, preparing motivational events, awarding good performance, assigning dedicated office or personnel who serve as internal consultant and follow up the project, communicating about the benefit of the project, protecting the project from any obstacle, conducting regular evaluation of the progress are some of the activities the management has to care about.

- From discussion held by management team and learned from plan documents of the company there is a gap for involving everyone in the Kaizen in equal footing, table 4.11 on No 12 Irregularity of implementation between departments answered "yes" 62.9%, few people talk signals are there, there is gap on coach kaizen teams, resistance to change didn't cleared out in full, Lack of momentum, there is one big-bang improvement event, training course, or communication campaign. At some points no

sense of ownership can be seen clearly. In some work units Kaizen is not a real priority, Lack of resources has also considered as significant problem.

On the other hand good experience has there regarding working using process standards ,table 4.8 question No 6 answered “yes” 58.06%; for using reliable and tested technology answered “yes” 59.68%; for visually seeing the situation in process answered “yes” 59.67%. These are good sides for the company.

CHAPTER FIVE

Summary, Conclusion and Recommendation

6.1 Summary

Mugher cement factory planned to introduce kaizen system to improve its operational efficiency and enhance its competitiveness. From data collected and study conducted kaizen implementation, in general, has positive impact in such aspects as cost reduction, quality improvement and in reducing of the seven Muda. The study reveals also that there was high participative approach and commitment, mainly from workers side, in practicing 5S program. The project influences, to significant level, the human resource to understand the need of continous change.

As any change management the level of success kaizen implemntation greatly depends on the management commitment. It has been found that, in the case company, the management commitment was moderate. Some departments has excel whereas some don't. However the opportunity for kaizen to improve capabilities is significant, but management must be able to provide the direction and encourage the employees participative culture.

To highlight some weak points of the project using KPI of the Model indicated on Figure 2.5 on chapter two; i.e. Setting of clear vision, Urgency, implementation Capabilities, Incentive provision, resource allocation and working using action plan; some gaps has clearly observed on its implementation. For these reason the factory paying such pries as confusion on implementation in some areas, anxiety, restraint and resistant to certain extent, frustration due to lack of resource and false start are also observed in some work areas. In other word it can be said that the kaizen implementation of the factory didn't stand on equal footings among departments and work units.

6.2 Conclusion

To assess the successes and failure of implementation of kaizen in the case company, Mugher cement factory, date was collected using questioners, discussion with selected management team, review of records and documents has made. Descriptive statistics was used to evaluate the extent of implementation of kaizen system success, and to determine the challenges the company encountered in kaizen implementation.

The study shows that the company performed well, to certain extent, in introducing kaizen system to its work process, organizing kaizen team in shop floors, practicing 5S and the 7 muda elimination, improving efficiency in work process.

By implementing the kaizen system the company gains much advantage; i.e. financial benefits by cost reduction, increases workers participation, increases job satisfaction, gaining additional work space, work place accident reduction, performing by using work standards. Above all kaizen system perceived as better and acceptable than previously implemented management systems.

The study identified some of the challenges in implementation of kaizen; Impact of the previously implemented management systems significantly shades the success of kaizen. Management commitment and practical support, absence of kaizen implementation plan at corporate level, lack of understanding of kaizen concept and considering it as specific group task, misconception as kaizen additional work and one time work, absence of incentive for good contribution of kaizen implementation, gap in setting up department dedicated to promote kaizen, irregularity of implementation between departments and within the department, gap in identifying and prioritizing work areas that can gain more benefit than others, lack of resource, absence of comprehensive evaluation system and continous training are seen as the major challenges in kaizen system implementation.

6.3 Recommendation

This study proposes some recommendation for further improvement of kaizen implementation of manufacturing sector. Kaizen system is found advantageous for the purpose of improving operation performance, enhancing quality of product and understanding of value from customers' perspective. This in turn gives companies competitive advantage both in local and foreign markets.

Kaizen can give vital advantage if it is planned comprehensively and integrated to the main strategy of the company. The corporate level plan should be cascaded down to shop floor level with clear time framed goal and clear responsibility.

In order to enhance kaizen project, beside the support provided by the Ethiopian kaizen institute, company needs to establish its own strong kaizen setup (department) that can promote kaizen and serve as internal consultant.

Deep start up training, periodic refreshment training and continous coaching of the implemntation process needs strong attention.

Identifying strategic work unit that can gain high benefit from kaizen implementation and prioritizing in allocation of resource and efforts is among the key points to be considered by the management.

In order to improve process, current process has to be defined through a set of standards. Those standards should be changed or improved on regular bases, otherwise no change over those standard means there is no kaizen.

In kaizen implementation kaizen team plays a crucial role, because kaizen performance starts from defining and solving problems, most improvement ideas and suggestions are generated by kaizen teams; in general kaizen teams are the building blocks agile company. Therefore management gives due attention in organizing collaborated, purposeful and goal oriented teams and facilitate its performance. Preparing kaizen event and recognition of best performance encourage the upcoming performance.

Mugher Cement Factory currently uses not only kaizen, but there are also others; such as balanced score card management system. I recommend that the integration of these systems need further study to be used in more advantageous way for the company.

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Annex

ST. MARY UNIVERSITY
SCHOOL OF GRADUATE STUDIES
INSTITUTE OF QUALITY AND PRODUCTIVITY MANAGEMENT
DEPARTMENT OF QUALITY AND PRODUCTIVITY MANAGEMENT

Dear Respondents:

This questionnaire is designed for partial fulfillment of MSc program, Saint Marry University, School of Graduate Studies in Quality and Productivity Management, for academic year 2017/18.

The information gathered and the finding of the research paper is dedicated only for academic purpose and will not pass to the third party without the clear permission of the company.

Your cooperation is highly appreciated for answering the questionnaire dedicating your valuable time and sharing your knowledge to me.

Contact Address: Fikadu Deme Tel: - 0911207517
E-mail; - fikadu.deme@yhaoo.com

Thank you for your cooperation**.**

2 2. Demography (please mark " ✓'' at space provided)

2.1 Your Name (optional)

2.2 Sex male ☐ Female ☐

2.3 Your marital status; unmarred ☐ married ☐ divorced ☐

2.4 Your current Position in the company _____

_____

2.5 Your profession (Education) type and level _____

_____

2.6 Your total service year _____

3 Do you know about the following management tool/system? (please mark " ✓'' at space provided)

		Yes	No
1	Kaizen		
2	Quality management system		
3	Business process reengineering (BPR)		

4 Did you get any training on how to implement/use the above mentioned management tools/systems at your company/work place within last 3-5 years?
(Please mark " ✓ " at space provided)

		yes	No
1	Kaizen		
2	Quality management system		
3	Business process reengineering (BPR)		

5 If you know kaizen /received training/; did you implemented the following at your company/ work place? (please mark " ✓ " at space provided)

5.1 **5 S**

		Yes	No
1	Sort		
2	Set in order		
3	Shine		
4	Standardize		
5	Sustain		

5.2 **The 7 waste (muda)** /

Which of the following waste you already avoided or striving to avoid at your work place? / (please mark " ✓ " at space provided)

		Yes	No
1	Over production (production more than needed)		
2	Unnecessary Transportation (Transporting parts, consumables, finished goods in to or out of storage or between processes by unplanned way)		
3	unnecessary motion (any wasted motion to pick up parts, tools, or wasted walking with in work areas)		
4	unnecessary inventory (Maintaining excess inventory of parts in process, finished goods or consumables)		
5	Inappropriate processing or over processing (doing more work that is unnecessary)		
6	Waiting (any non-work time waiting for tools, spare parts, supplies etc…)		
7	Defect making (repair or rework of material & labor west)		

5.3 Do you practice the Kaizen 14 principles (Toyota kaizen principles)?

(Please mark " ✓ " at space provided)

		yes	No
1	Does your operational decision base long term philosophy, even at expense of short term financial goals?		
2	Does your production process work as continous process flow to bring problems to surface? (Strive to cut back to zero the amount of time that worker is sitting idle or waiting for someone to work on it)		
3	Is there any system for providing your internal consumers, in the production process, with the material what they want, when they went, and in the amount they want?		
4	Does your work process Level out the workload? (Eliminate over burden to people and equipment and eliminate unevenness in the production schedule)		
5	Is there a culture of stopping to fix problems soon as it appears, to get quality right the first time? (build in to your organization support system to quickly solve problems)		
6	Do you Standardized tasks at operation process? (This is the foundation for continous improvement and employee empowerment.)		
7	Are you using visual control at your operation process so as to make no problems are hidden? (Avoid using a simple computer screen, design visual system at the place where the work is done, and Reduce your reports to one piece of paper wherever possible, even for your most important decisions.)		
8	Did you develop any experience in using only reliable, thoroughly tested technology that serves your people and process?		
9	Do you growing leaders who thoroughly understand the work, Live the philosophy of the company, and teach it to others?		
10	Are you developing exceptional people and teams who follow your company's philosophy?		
11	Do you developed culture to respect your extended network of partners and suppliers and helping them improves their performance? (Have respect for your partners and suppliers and treat them as an extension of your business)		
12	Do you have such experience as visually seeing for yourself to thoroughly understand the situation? (Solve problems and improve processes by going to the source and personally observing and verifying data rather than theorizing on the basis of other people or computer screen tell you)		
13	Do you developed such experience as making decision by		

	consensus, thoroughly considering all option and implement rapidly?		
14	Is there a system that makes your company become a learning organization?		

6 Did you get any advantage in implementing kaizen at your company/ work place?

Yes ☐ No ☐

6.1 If your answer for No 6 is yes; which benefit / additional facilities/ of the following you get?

Please mark: - For Very good benefit /facility/ under 4
For good benefit /facility/ under 3
For satisfactory benefit /facility/ under 2
For no benefit /facility/ under 1
(Please mark " ✓ " at space provided)

		4	3	2	1
1	Clean and attractive work place				
2	Time saving for searching file, tool, spare part….				
3	Cost saving				
4	Increase efficiency				
5	Work place accident and disease reduction				
6	Data recoding improvement				
7	Idea sharing among team members				
8	Work with plan				
9	Evaluation of performance with schedule				
10	Achievement recognition				
11	Overtime work reduction				
12	Improve work scope (Doing more on new things)				
13	Improve work culture				
14	Helps for Human resource succession plan				
15	Use of kaizen board / suggestion box/				

7 What were the major challenges in kaizen implementation?
(Please mark " ✓ " at space provided)

		yes	No
1	Lack of top management commitment		
2	Lack of middle and lower level management commitment		
3	Misunderstanding of the concept or the tools		
4	Lack of training		
5	Absence of incentive		
6	Lack of confidence on the kaizen tools for its continuity.		
7	Taking longer time on every single steps		
8	Lack of resources		
9	Absence of satisfactory result in implementation		
10	Absence of recognition for excellent performance		
11	Difficulty of valuing in to monetary term what has achieved		
12	Irregularity of implementation between departments and within department units.		
13	Problem in record keeping.		
14	Inconvenience of the work place to implement the system.		

Thank you for your cooperation!

ST. MARY UNIVERSITY
SCHOOL OF GRADUATE STUDIES
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DEPARTMENT OF QUALITY AND PRODUCTIVITY MANAGEMENT

Interview Questionnaire with Management Team

This questionnaire is designed for partial fulfillment of MSc program, Saint Marry University, School of Graduate Studies in Quality and Productivity Management, for academic year 2017/18.

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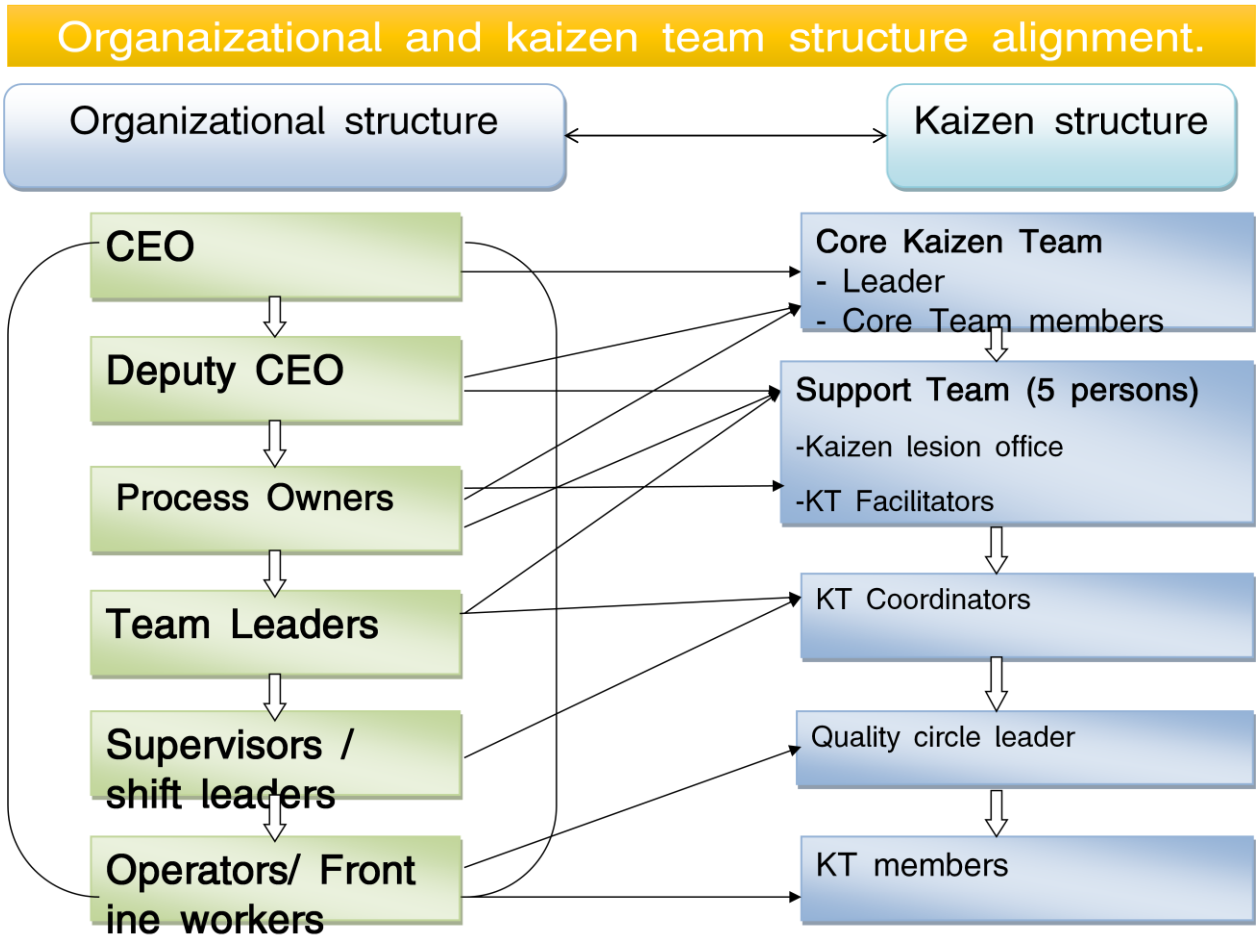
Contact Address: Fikadu Deme Tel: - 0911207517
E-mail; - fikadu.deme@yhaoo.com

Thank you for your cooperation**.**

1. When and why Mugher Cement Factory Introduce Kaizen management system? From where the initiation was come?
2. What procedures did you follow to introduce and implement? What was the workers perception?
3. How was incorporation of kaizen implementation plan to corporate strategic plan? Allocation special resources? Provision of training? Evaluation of performance periodically?
4. How do you see the impact of previously implemented management systems on kaizen implementation?
5. Were there any challenges on implementation of kaizen? If yes; please explain some with their reason.
6. Do you think that the company gains from implementation of kaizen?
7. Do you think that kaizen implementation help to capacity utilization improvement?

Cost Saving Achievement by Mugher Cement Factory Kaizen Team from Year 2007-2010 (9th month)

S/N	Departments	2007	2008	2009	2010 (9th month)
1	Raw material preparation and supply Department	8,854,487	5,869,824	4,388,480	7,436,933
2	Clinker Production Department	(47,414,939)	(13,113,115)	30,168,476	46,306,039
3	Cement Production Department	19,883,514	18,031,066	29,146,155	1,374,295
4	Engineering Department	28,217,000	33,031,000	14,650,101	10,340,000
5	Quality Control & Product Development service	10,566,164	3,687,271	(4,706,641)	(3,817,721)
6	HR Department	5,246,273	5,684,910	2,770,206	2,866,085
7	Marketing Department	-	377,136	491,034	-
8	Finance Department	427,909	521,574	1,076,444	180,355
9	IT and System Development Department	185,026	233,547	306,747	220,414
10	Health Service		227,000	172,000	72,000
	Total	**25,965,434**	**54,549,714**	**78,463,002**	**64,978,400**



Source: - Mugher cement factory kaizen implementation plan document; 2015.