Quality Circle in Sugar Industry: Benefits and Shortcomings

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Abstract—*Quality circle plays an important tool to improve the productivity and quality of the product in any industry. This paper provides a considerable support in theoretical and practical aspects of Quality circle. Quality Circle is the management concept designed to bring together all workforce in an organization for setting standards of excellence and achieving the desire goals. This paper reflects the benefits of Quality circle in Indian sugar industry and problems faced by Indian sugar industry like low productivity and Quality. The main perspective of the study is to find the causes or factors which affect the productivity and quality of the product.*

Keywords: - Quality circle, Productivity, Quality, Quality circle Strategy, Literature Review, Sugar Industry

I. Introduction

The Indian sugar industry is the second largest sugar industry in the world after Brazil. The total production of sugar industry per year is near about 25 Metric Tonne. More than 50 million farmers and their families dependent on sugar industry in rural areas so it plays an important role in our economy.

The recovery rate in India is 9.9% whereas in Brazil the recovery rate is 14.5% this shows that there is some problems with the techniques and variety of the sugarcane,According to the definition of Quality Circle it is a group 6-8 worker, usually under the leadership of a team leader, who are trained to identify, analyze the work-related problems, to find the solutions of the problems and suggest the solutions to management in order to improve the performance of the organization, and motivate the workers. Quality circles are an alternative to the rigid concept of division of labour, where workers concentrate on solving the problems. The additional use of Quality circles is improving occupational safety and health, improving product design, and improvement in the workplace and manufacturing processes. The meetings of Quality circle arranged regularly on company time and are trained by specialized persons who may be specialists of personnel and industrial relations and also specialists of human factors and the basic skills of problem identification, information gathering and analysis, basic statistics, and solution generation. Quality circles are generally free to select any topic they wish (except salary issues and terms and conditions of work, as there are other channels through which these issues are usually considered This paper reflects the role of Quality Circle in Sugar Industries and other related ones to find out benefits, short comings and various methods to improve productivity as well as Quality.

II. Literature Survey

There is a vast amount of literature related to the Quality Circle. The objectives of review are:

- To study the various aspects of Quality Circle in sugar and related industries..
- To elaborate the benefits and shortcomings of Quality Circle.
- To identify the effect of Quality Circle on productivity and Quality.
- To find the technical problems in sugar industry which affect the productivity and Quality of sugar?

Literature has been reviewed through Indian and International journals, books, conference paper etc. and collected inform of is conceptual articles. Surveys, reviewed articles and case studies.

Indian Sugar Report (May 2013) shows that the recovery rate of Indian sugar industries is lower than the Brazil, Australia and other 4 countries. The demand in India is increasing every year but the production is not increasing accordance with the demand. Maharashtra is the highest sugar supplier state in India. To balance supply and demand the industry has to improve its productivity.

SHINDE U.R et. al. (2011) describes the comparison between Cooperative and private Sugar mills. In private sugar mill and Cooperative sugar mill the crushing rate, crushing season are almost same but in private sugar mill produce sugar with the recovery rate 12% whereas in Cooperative sugar mill is 11.38%. The study shows that the mill extraction is poor in Cooperative sugar mill. It indicate that in our country private sugar mill is producing more sugar with same input so this shows that the technique are to be made efficient in Cooperative sugar mills.

J.D. BLAIR et. al. (1983) describes some implications and caveats for the use of quality circles as a basis for improving quality and productivity. In this paper, quality circles have been found to be useful in some companies and have thus helps to improve the declining productivity in companies in the United States.

This widespread interest in quality circles comes as the primary objective to increase productivity and quality of the production/ manufacturing sector through direct employee participation. Author attempts to provide an objective analysis of the quality circle concept as a method for improving productivity and quality. It is found that QCs can improve the decision-making process within organizations through expanding the range of alternatives considered, improving the upward flow of information from the production floor, and generally expanding training and experience in the problem solving process. The authors have attempted to provide an objective analysis of the quality circle concept as a method for improving productivity and quality in U.S. manufacturing organizations.

E. TURBAN et. al. (1984)describes methodology for a cost-benefit analysis of quality circles. The aim of the study was to increase productivity, the quality of products, and the quality of work life. Initially, the Japanese QC concept was not based on any economic factors. The program was designed to bring about long term benefits of improved quality and communication. There was substantial evidence that productivity improvement and/or cost reduction was gaining momentum in the two countries. For

example, a 1980 report on QC activities in Japan indicates that 45 percent of all projects completed were cost reduction, 30 percent dealt with quality improvement, and 5 percent with tooling. Intangibles such as improved morale and communication scored only 3 percent each. Cost-benefit analysis of QC may appear to contradict the original philosophy and concepts of QC. However, there was increasing evidence that sooner or later it will be necessary to conduct such an analysis in order to justify the QC operation. A cost-benefit analysis should be conducted at three levels: the project level, the circle level, and the system level. While many companies are conducting some cost-benefit analysis at the project level, very few venture into the other levels. The methodology presented in this paper is intended to assist in building an appropriate cost-benefit analysis and the necessary accompanying information system. The methodology can be computerized, so that the cost of the analysis itself will be reasonable.

D. ELMURTI et. al. (1990)describe a study that compares changes in perceptions of productivity and job satisfaction for participants and nonparticipants in a computer aided quality circles program in a multinational firm in Saudi Arabia. The results of this study indicated that participation in computer aided quality circles program had a positive and significant impact on productivity and job satisfaction. This research was conducted in the spare parts vehicle division of a large sized diversified multinational company in Saudi Arabia. In response to these problems, the spare parts division management decided to computerize operations aided by a quality circles program. Participants in a computer aided quality circles program would report higher levels of productivity and job satisfaction than would non-participants. Second, the productivity measures clearly indicate positive impact of computer aided quality circle participation on employee efficiency and overall productivity claimed by QC proponents due to participation in the program. Absenteeism rate dropped consistently for the project participants, while the absenteeism rates prior to the implementation of the project for the participant and nonparticipant groups had been the same. Quality circles are a viable means and effective tools for improving the work environment and offer an alternative for dealing with the growing anxiety and frustration of today's employees.

T. R. ABO-ALHOL et. al. (2005)describe that whether QCs in service sector are performing as effective as manufacturing department do. 109 QCs members participated from five Malaysian companies in this survey. Results showed that Industrial QCs members were more enthusiastic than service QCs members in terms of involvement in QCs activities and showed higher job satisfaction and job commitment compared to members in service organizations. In a few words, the QC group has to function effectively as a multi-disciplinary team, focusing on improving selected work processes. Bank of America also noted that a drastic improvement in productivity and increased morale through QCs. After having been slightly modified, was mailed to a sample of five companies in Malaysia's of Dec 2003 Responses for the questionnaire was gathered from two groups. The first group consisted of members of QCs in manufacturing companies. The second group of respondents was members of QCs in service organizations. The questionnaires was related Employee Involvement Program. This indicates that QC members in service sector are not new to QCs and have more experiences in the success or failure of QCs than industrial QC members have. It can be seen that the respondents all agreed that their QC problem solving tools and techniques have fairly improved. The general feeling of the members towards QC is to some extent, positive. Unlike QCs in industrial organizations, QCs in service areas strongly agreed that their circles have made a worthwhile contribution to their organizations, which also profited financially from their circles' efforts. The results indicate that Industrial QC members are fairly satisfied with their job as they agree that the company is a good place to work. The industrial QC members also show strong willingness to expand their efforts to achieve organizational goals and job commitment. It can be concluded that industrial QCs members were more enthusiastic than service QCs members in terms of involvement in QCs activities.

R. N. RAI (2009)describe the performance of quality circles in five Indian companies as BHEL (Bharat Heavy Electricals Ltd.), SM Creative Electronics Limited (SMCEL), Bharat Electronic Limited (BEL), BSNL (Bharat Sanchar Nigam Limited) and Amul (Anand Milk Union Limited) have been considered for the study and data were collected through a questionnaire to employees in these and asked them to fill up the questionnaire accurately as possible. Companies like BHEL, HAL, Kirloskars, Allwyns, Shri Ram Fibers, TELCO, TISCO, BEL, Jai Engineering have already implemented quality circles. However they have also attempted the use of quality circles in other areas as cost reduction, safety, purchase of materials, design, general improvement etc. Over two decades, the number of Quality Circles in BHEL has grown to members account for 27.4 percent of the company's workforce. According to Public Relation Officer of Hardwar BHEL plant, Quality Circles have contributed a saving of Rs.20 millions to the organization. QCs decreased the number of absentees in the last five years and employee turnover rate is very good.

In SM Creative Electronics Limited (SMCEL), the number of Quality Circles has tripled in the last six years which indicates very good performance of this company.

In BEL, in last three years quality circles have increased from 15 to 25, which is a good indication quality movement. As in the case of BSNL the saving cost ratio was in between 5:1 to 10:1 which is high in spite of less number of proposals being accepted and also higher number of employees per circle. It can be testified that the suggestions that were accepted very effective and caused significant cost reduction.

In AMUL, the number Quality Circles has been decreasing by the years and in spite of good number of employees being involved in the program the QC has not been effective at all the entire blame has been put on the management, which lacked proper communication and middle management support. The response was cold and the management never bothered about the program.

The results of the experiment of Quality Circles in Indian industries are encouraging. As our organizations are improving the quality of our products, the foreign

competitors are also continuing to improve their product quality.

N.K.K.PRASANNA et. al. (2011)describes the various aspects of Quality Circle and how improvements can be made by adopting practices of Quality Circle in petrochemical industries. The paper describes a case study of QC concept in a petrochemical industry which illustrates the effectiveness of QC approach. The Objective of the study was Optimization of grease consumption in centrifuges. The Deming Wheel was technique used by the author. Brain Storming session was conducted and following causes identified were like Improper method of greasing, Failure of mechanical seal, Unavailability of m/c for regular greasing, No proper planning for greasing. Over greasing, Lack of knowledge, Improper grease gun, Amount of grease not known, Poor grease quality, Grease passed away to non utilized cavity, Grease leaked out from connector tubing.

The Fishbone Diagram was drawn to find out the causes of the events. Each cause or reason for imperfection was a cause of variation. Causes were usually grouped into major categories to identify these sources of variation. The categories typically include: Man, Material, Method and Machine. After implementing the Quality Circle the results are Greasing time is reduced, down time is decreased and Quality of grease has been improved in removed centrifuge. Total Saving after implementing was Rs. 936000. Optimization of grease consumption in the centrifuges led to reduction in maintenance costs, enhancement in reliability and availability of the equipment, enhancement in morale and development of a sense of team dynamics among the employees, which proved to be beneficial to the employees and the organization as a whole.

KANNAN S et. al. (2011)describe whether QCs in public sector are functioning more effectively than the private sector in India, in periods of length of participation, training, participants' feelings about QCs, and organisational support to QCs. The study was conducted in six organisations (three public sectors and three private sectors) of a large scale manufacturing. The results of the study show that participants from both sectors experienced their improvement in work life after joining in the QC programme with job satisfaction. The private sectors aiming on profit maximization and the public sector aiming at service delivery have inherited and internalized the QC process differently. A number of studies indicate that private performance is more efficient than public performance. This result points out that more involvement by QC members was found in public sector than private counterparts. The results indicate that participants realised that there is an improvement in their personal life. The results reveal that Quality Circle participants in both sectors agree that their problems solving skills have improved since joining the program. However, it was quite less among the participants in Private sector organisations. The data shows that the organisational support to QCs in private sector organisations is less when compared with public sector organisations. It can be concluded that public sectors provides full-fledged support to QCs compared to private sectors in terms of longevity and employees perception and hence higher positive results were found in public sector organisations.

III. Finding From The Literature Survey

Quality Circle aspect: It is clear from the literature survey that Quality Circle examples an important role in sugar industry. As sugar making is a process with involvement of machines and procedures so it is there are chances to improve in both the fields.

Sugar is a carbohydrate that occurs naturally in every fruit and vegetable. Sugar occurs in greatest quantities in sugar cane and sugar beets from which it is separated for commercial purpose. The natural sugar stored in cane stalk and beet root is separated from rest of plant material through a process known as refining which is carried out in following steps:

- Processes of sugarcane to extract juice.
- Boiling the juice until it begins to thicken and sugar begins to crystallize.
- Spinning the crystal in a centrifuge to remove the syrup, producing raw sugar.
- After this it is washed and filtered to remove remaining non-sugar ingredients and colour.
- Crystallizing, drying and packaging the refined sugar.

It is clear from above discussions that Sugar industry facing a threat on its productivity and Quality due to one of more technical errors in processing. Quality Circle is the technique which can help to overcome all the problems.

From the literature it is clear that the productivity in sugar industry may be less due to following reasons:

1. Lack of motivation
2. Lack of knowledge
3. Inadequate training
4. Worker carelessness
5. Unskilled worker
6. Poor workmanship
7. Incomplete breaking of fibre of sugarcane
8. Poor juice extraction
9. Mix juice with water vapours
10. Improper mixture
11. Immature sugarcane
12. Improper cutting in fields of sugarcane
13. Poor quality sugarcane
14. Not proper maintenance

IV. Benefits Of Quality Circle In Sugar Industry

It has been observed from Literature survey that Indian Sugar industry facing some serious problems regarding its productivity and quality. From the above literature it is clearly notice that Quality Circle can be very useful tool for sugar industry. Quality Circle can:

- Improve quality and productivity of sugar industry.
- Reduce the cost of products or services by waste reduction, safety, effective utilization of resources, avoiding unnecessary errors and defects in Sugar industry.
- Identify and solve work-related problems of sugar industry.
- Improve communication between the high level and low level management in sugar industry.
- Improve employee's loyalty and commitment for sugar industry

V. CONCLUSION

Quality circle practices can play an important role in improving productivity and quality sugar industry. While reviewing the literature we have found some factors which critically influence the production and quality in sugar industry. The analysis done in this study demonstrates that there are three: Management, Technical and Other factors (like raw material) which cause declining the growth in the Indian sugar industries. If all these factors are balanced in a systematic way, the concept of Quality Circle will provide a competitive edge to the Indian sugar industries resulting in higher productivity and hence higher revenue and profit. It would also provide workers a higher satisfaction resulting in increase in revenue of sugar industry and also improve the working environment of the sugar industry.

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