Abstract
This paper examines the concept of TQM and investigates and identifies factors in all three phases (design, execution and operation) involved in the process of improving housing areas of the urban poor. In this paper it is argued that projects for improving housing areas of the urban poor are quite different from manufacturing processes, but it can be pointed out that as TQM becoming widely accepted in all manufacturing and construction industry its general principles and concepts are universally acceptable and can be applied for improving housing areas of the urban poor. The process can be conceptualized for higher quality and increased satisfaction of the stakeholders including dwellers.

1. INTRODUCTION
Urban poor, who work for the vast majority of city functions and keep the wheels of city economy moving, still live mostly under conditions of deprivation and stigma and lead their lives in misery. As such their housing areas need to be improved not only by offering them social justice but also protecting the city environment. Our national and state housing policies are also giving high priority for improving their housing areas. But despite tremendous efforts by way of giving them various concessions under social housing schemes, housing areas of the poor have made no significant improvement and that is why the issue of improving housing areas of the urban poor is still taken up space more often in the academic and political arena. One of the major reasons responsible for not yielding desired results is the lack of proper coordination and management among various housing agencies and institutions which are responsible for improving housing areas of the urban poor.

In recent years, the concept of Total Quality Management (TQM) is drawing attention of every field as many times meaningful yield is witnessed by successful implementation of TQM particularly in manufacturing and electronic industries. The basic philosophy of TQM focuses on the process improvement, supplier and user, teamwork and training to achieve desired end results and customer satisfaction. It further focuses on continuous improvement in processes rather than attempting to inspect the end product for desired quality.

Much of the TQM concepts are attributed to the teachings of Deming and Junar. They emphasized that majority of problems encountered in manufacturing are with the processes and that statistics can be used to control these processes. They also outlined the managerial approach to quality control and focused on achieving...
customer satisfaction through a project team approach with project by project improvements. Training at all levels from workers to top management is also emphasized. In all instances high weightage is given to continuous improvement.

This paper examines the concept of TQM and investigates and identifies factors in all three phases (design, execution and operation) involved in the process of improving housing areas of the urban poor.

2. PHASES AND FACTORS AFFECTING QUALITY OF PROCESSES

All the project proposals for improving housing areas of the urban poor begins at the project inception stage and include three distinct phases. First phase is the ‘design phase’ in which project proposal is conceptualized and detailed drawings and specifications are finalized. Second phase is the ‘execution phase’ in which the project is implemented through executing agency or contractor. Last phase is the ‘operations phase’ in which dwellers occupy the dwelling units and start living. This is the most important phase which mostly deals with the satisfaction level of dwellers and also refers to the successful or non successful implementation of the project. It is the phase through which sustainability of the project can be determined.

For improving housing areas of the urban poor, establishing project requirements begins at project inception. A careful balance is essential between dwellers’ requirements, cost and schedule, desired operation characteristics and planners’ need for adequate time and budget to meet these requirements during planning process. The planner strives to satisfy the dwellers’ need and obligated to protect environment and community from ill effects of housing areas of the urban poor. The implementing agency is responsible for methods, techniques, sequences and procedures of implementation in the execution phase. It is also responsible for maintaining quality according to the specifications supplied by the planner.

Achievement of high quality can be enhanced with long term support and top management and needs leadership of higher management to generate innovative activities that can lead to process improvement. Team structure and coordination system are necessary for desired results. The importance of training that must begin with higher management in achieving high quality is underlined by most TQM experts. Customer service and satisfaction are the terms that are gaining acceptance globally in all fields. They are used to define quality of service, reliability, responsiveness, assurance and empathy. Customer service is delivered in real time usually face to face with customers. Hence it requires special attention and therefore extensive training. The process improvement with measurement and analysis of data are very important in achieving high quality. Statistical methods are useful tools for collecting and analyzing data throughout the process along with feedback mechanisms. Another concept used in manufacturing and construction industry is the cost of quality. This concept includes the direct and indirect costs associated with the project. A study conducted by Chrest in 1993
indicates quality improvement teams, education, continuous improvement, communications, company performance feedbacks from client and employees and statistical process control are very important factors that affect quality. A study conducted by Graves underlines the importance of training in several small sessions rather than fewer larger ones.

Keeping this in background, literature survey was conducted to identify factors that affect the quality of process in all the three phases for improving housing areas of the urban poor. Identified factors are listed in Table 1.

**2.1 Management Commitment and Leadership**

Success of any TQM program mostly depends upon management practices. The first step of the management is to recognize that there is a problem. In TQM process poor management practices are one of the major causes for unsuccessful implementation and non-completion of the project. The process of quality improvement through management commitments is the most significant feature of TQM. Level of management leadership in promoting quality is one of the extremely important factors in design execution and operation phase. Administrators, planners,
executing agencies and even dwellers all agree on the importance of leadership in promoting continuous quality improvement.

2.2 Training

Training to administrators and planners is ranked very high in the design phase whereas in execution phase importance is given to training of staff to clarify the objectives of the project and ways to achieve high quality. Emphasis should be given on customized training plans for administrators, planners, technical and non technical staff. Administrative training for administrators is considered more important than technical training at design and execution level. International Standards Organization ISO 9001 also emphasizes the importance of training and underlines that activities demanding acquired skills should be identified and necessary training should be provided. In execution phase, training to dwellers regarding concepts of self help housing and other concepts may improve their public participation and process quality. Executing agency should figure out the need and work to be executed in which local dwellers can be involved and their training can be focused on these points. In operations phase, to enhance the satisfaction of dwellers, training for giving feedback is also required for dwellers.

Major quality concepts, especially training in communication skills and teamwork, may widen the perspective of planners and administrators. Training is a feature on which great deal of emphasis should be given. It is considered as an essential ingredient and not only requires a break with traditional but also involves a change in the culture of organization. Traditionally, training for quality has been concentrated in the quality department, but in reality it needs to be extended to entire management team involving all functions at all levels.

2.3 Teamwork

Cooperation and coordination of planners and administrators within the same organization is very important in design and execution phase. Communication and cooperation between planners are vital for sound design. Teamwork is an essential part of design and cooperation is their main structure for teamwork. Cooperation lies in the improved communication and enhanced organization. Lack of cooperation may result in inconsistent design, which then may cost extra time and money throughout the execution processes. Emphasis should be given on self managing design teams where results are assured not only by management command and control but by high performance teamwork at the design level.

To avoid conflicts in the execution phase, teamwork is important. Improving efficiency and coordination between teams is the management task. Teams may improve the quality of processes if they are allowed to express their opinions. Teams may improve executing techniques and productivity and therefore reduce the amount of rework and decrease the costs. On the other hand bad level of coordination between various agencies or executing bodies can be enhanced by
today’s information technology. Inadequate level of coordination may lead to major conflicts such as overlapping activities, insufficient resource allocation, etc. The ultimate goal of the team approach is to get everyone involved within the process of improving quality.

The focal point of quality team organization is the advisory committee responsible for establishing the team structure to develop policies and procedures for implementation processes and team formulation.

2.4 Statistical Methods
Statistical methods are very important in improving quality and provide an essential problem solving tool to the TQM process. It is important as in TQM process decisions should to be based on facts and hard data, and not on opinions and institutions. Importance of statistical techniques is also underlined by ISO 9001. Since the prototype solution for improving the housing areas of urban poor can not be developed due to regional, socio-cultural, economic and political factors, which have influence on basic design, generate variety and ultimate potential for any kind of statistical process control.

2.5 Feedback
As the lifecycle of the projects for improving housing areas of urban poor is much longer, there is a difficulty in taking feedback. Sometimes even the information coming from feedback will have little relevance with reference to that project, but with the help of which quality database can be prepared that can eliminate repetition of identified defects. After the project is completed and is in use, a formal meeting should be held by the representatives of the dwellers to obtain feedback regarding quality and performance. It is an important activity for evaluating quality of the completed projects and to access satisfaction of dwellers. True measure of success of the project can only be determined by how well the finished facility meets the expectations of dwellers.

2.6 Involvement and Cooperation among Planners, Executing Agencies and Dwellers
Ability to produce good quality design largely depends on the relationship between planners, executing agencies and dwellers. Quality of any stage in the process is contingent on the quality of previous stage. For example, quality of design is related directly to the clarity, explicitness and observations based on the existing socio-economic and physical condition of dwellers. Quality of execution is directly related to the clarity of design, details of specifications, etc. Quality in the operations phase is the function of the quality in the design and constructional phase. Quality of the entire project is the function of the quality of design, execution, operation, maintenance and management.

In the design phase, extent of cooperation between planners and dwellers is most important factor that affects quality of the project. For identification of solution
of the problems related to quality assurance for quality improvement in design phase needs the involvement of people who are intimately involved with the problems. Implication is that a quality program can not be implemented successfully in the design phase without efficient cooperation of dwellers.

In the construction phase, cooperation with executing agency is very important. When members of the project team and members of the executing agency are competent to work together, chances to achieving higher quality is greatly enhanced. Moreover, members of the implementing agency should work in harmony with the dwellers to avoid disagreements, minimize litigations and reduces tensions.

3. SPECIFIC FACTORS FOR IMPROVING HOUSING AREAS OF URBAN POOR

The above factors are generally accepted factors that are effective in achieving high quality. However, due to complex nature of the process for improving housing areas of urban poor specific factors may also contribute to the level of quality in each phase.

3.1 Specific Factors in Design Phase

Community participation is the most significant feature of the design phase. Communication with dwellers shall be handled carefully to know and understand their requirements and to make them feel that they are also part of the design team. It is the necessary step to make the project sustainable and viable. For this method of conducting surveys is extremely important. Rather than adopting conventional and formal methods of survey by filing various formats, informal approach should be adopted involving dwellers in survey teams. During the survey process information regarding personal problems and aspirations of dwellers should also be dealt with.

In the design phase project specifications are also considered important as they are documents that provide technical information on performance and quality requirements. They are some kind of translated form of dwellers requirements. Inadequate translation means loss of dwellers information and requirements. Therefore, definitions should be clear and consistent with requirements. Moreover, requirements and socio-political conditions may change during the process of design and execution due to longer lifecycle of housing projects, systematic communication with dwellers may save money, time and aggravation of dwellers.

Use of appropriate technology in design phase should also be given due weightage while designing and drafting specifications. Design and specifications should match with the socio-economic status of the dwellers. Technology should be reviewed with the compatibility with easy availability and familiarity with local materials and labor for easy construction and post construction maintenance. This will enhance public participation in the construction phase and will give sense of belonging to the dwellers in the operations phase.
For easy and fast execution of the project, legal procedures related to the project shall be compiled and well laid out. These are then approved by the competent authority. This will reduce litigations in the court of law and helps in fast and successful implementation of the project.

3.2 Specific Factors in Construction Phase
Due to government’s standard bidding process for execution of the project, selection of appropriate executing agency is very important in achieving high quality performance. The agency’s expertise, technical staff, financial situation, equipment ownership, work load and reputation will directly affect the quality of the project. Agency’s prequalification analysis can be used to determine its competence to meet the specific requirements of the project.

There are often inconsistencies between drawings and specifications of which executing agency normally takes the advantage. That is why it is critical that drawings and specifications should be clear, concise and uniform. It is necessary because final product of design work is a set of contract documents (drawings and specifications) to guide the physical execution of the project.

Periodic supervision by the planners is also considered important in the construction phase as the work is executed by various agencies and contractors and subcontractors. From the executing agency’s view point lack of information and minor decisions on site, which are common in any project, may result in reworks, high costs and poor quality performance. Effective coordination between planners and executing agencies may prevent much of this trouble. Improved communication and shared information by the planners will further increase the efficiency of the executing agencies.

3.3 Specific Factors in Operation Phase
Traditionally, the operations phase has been treated separately from the design and construction phases. But to achieve high quality in TQM process it should be considered as a part of the total process. This will increase the satisfaction of dwellers. In projects for improving housing areas of the urban poor, along with the generic factors maintenance manual and operations budget are extremely important. Maintenance manual should contain information about various specifications used in the project and periodic maintenance schedule. In larger run, appropriate maintenance can save money as timely maintenance can help in keeping the physical infrastructure in good shape. Operations budget originates from the availability of funds therefore at design stage, limits of the operation budget should be determined and budgetary provisions should be made.

4. CONCLUSIONS
In this paper it is argued that projects for improving housing areas of the urban poor are quite different from manufacturing processes, but it can be pointed out
that as TQM becoming widely accepted in all manufacturing and construction industry its general principles and concepts are universally acceptable and can be applied for improving housing areas of the urban poor. The process can be conceptualized for higher quality and increased satisfaction of the stakeholders including dwellers. There are several factors which may affect the quality of a project. Management commitment and leadership, training, teamwork, use of statistical methods, feedback and involvement of various parties are generally accepted factors that are effective in achieving high quality. However, projects for improving housing areas of the urban poor are more complex and hence specific factors may also contribute to the level of quality in each phase.

REFERENCES


