

Construction quality maintenance: Challenge for small scale construction around fast-growing Metro Cities Like Nagpur

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Abstract – Various international declarations, covenants and India's own legal explanations have emphasized the need of housing as a human right. However, far from its realization, the crisis of the housing sector in India, both in terms of shortages and availability of basic amenities, has deepened over the years. Still a lot of people manages to construct a house for them by all possible ways. After all these efforts if the quality of construction is not good enough then it adds to the maintenance cost of the house. Also, bad quality of construction may hamper the internal environment of the house leading to physical as well as mental illness of its users. In current scenario there is very less space available in crowded cities for construction and the available land is having a cost which is unbearable for most of common people, which gives rise to construction in the outskirts area of growing cities like Nagpur. Many of these micro constructions are executed by very small contractors who are not even registered with the authorities. Therefore quality is always at stake also, applying quality control is a very tedious job since construction of a house is a highly customized task.

Keywords- House, Construction, Outskirts of Cities, Construction Cost, Land Cost.

I- INTRODUCTION

Along with food and clothing, housing is one of the basic necessities of mankind. Adequate housing is an important component in the overall growth and development of an individual wherewith he can enjoy both mental and physical health and live in a state of security, peace and dignity. Housing is a fulcrum on which rests all the basic necessities required for a better living. Considering its vital importance and a basic prerequisite, it has been established through various international and national legal explanations and commitments that housing is a fundamental human right; as such, it enforces the government to ensure it through its policies and programmes. However, even after 74 years of independence of India, this right is an elusive dream.

Construction: - As per Britannica dictionary Construction, is the techniques and industry involved in the assembly

and erection of structures, primarily those used to provide shelter.

Quality:-Quality is defined as “The totality of characteristics of an entity that bears on its ability to satisfy stated and implied needs”

India is a very populated country with many people migrating from villages to cities many in search of jobs and few in search of luxury. Both of the kinds try to settle down in the cities and settlement in general means to own a house in the city. Most of these outsiders don't earn too much to build a lavish house in the boundary of city. So they try to buy a plot in the city outskirts area, as the cost of plots is very less compared to city limits. After this they build a house there, under their own supervision. Now a days there are many government schemes which are providing funding for construction of house for a common man, the basic idea behind this funding is to provide shelter to the needy in the country.

Achieving quality in construction industry in long run is a tough issue and has been a problem. Efficiently or no practice of quality management procedures will result in great loss of time, money and material resources. With the help of various studies done, it is found out that the quality of construction is not maintained properly in many cases, in the small houses constructions. This non maintenance of quality occurring in three phases of construction (design, construction, and operation) of a building project's life cycle affects adversely on the human habitat physically as well as mentally. This condition is uttered by most of the occupants saying that they don't feel fresh in the house which is mostly due to insufficient ventilation and absence of sunlight.

Therefore poor, quality maintenance is a very serious issue which is very common among the houses constructed on the outskirts of the cities and are poorly planned due to lack of awareness or financial issues.

II- LITERATURE REVIEW

According to Arowolo T.A, Kolawole O.A, Adewale A.K, Adeyemi O.M [1] Challenges exist of Poor construction quality requiring positive and prompt attention from stakeholders in the construction industry. Standards are not adhered to and clients are, many times, dissatisfied with projects executed. Also found out the most significant factors affecting construction quality are;

1. Greedy contractor (corruption).
2. Inadequate regulatory framework.
3. Quackery.
4. Lack of sanctions for offenders
5. Inadequate budgetary allocation

Solomon Oyebisi, Anthony Ede, Festus Olutoge, Ben Ngene, Olatokunbo Ofuyatan, And John Oluwafemi [2] evaluated the quality management and the quality grading practices in the construction project and recommended the quality management techniques in the execution of projects by construction engineers to build a safer society. Also, control and regulatory bodies in the construction environment should institute an award scheme for the best firm which strictly adheres to quality practices as a way of motivating them to use quality management techniques.

Bassam A. Tayeh, Wesam S. Alaloul and Waleed B. Muhaisen [3] identified the main internal and external challenges that small-sized construction firms are wrestling in the Gaza Strip. In addition to that, also reviewed small-sized construction firms' characteristics,

stages of survival and growth and importance to the economy. Concluded that small-sized construction firms should have a protection against unequal competition and a mitigation of financial loads. In addition to a group motivational measures to improve the opportunities for the small contractors to survive and grow.

Josip Juraj Strossmayer, Osijek [4] provided a comprehensive overview of the criteria used for the evaluation of housing quality in existing studies. The defined criteria were grouped into four categories: apartment unit quality criteria, apartment building quality criteria, apartment neighborhood quality criteria, and social and economic criteria.

According to Mohamed E L Zomor, Kristen Parrish [5] The three primary Pillars of construction project management are Time, Cost and Quality; these three pillars should always work hand in hand to underwrite success to projects. The researcher advises that this triangle must include sustainability/performance as the heart of these pillars; with each pillar serving a sustainability objective. Early contractor involvement within projects shall be fostered to certify reducing the gap left by the building process. The research explores misconceptions surrounding the process of building operation in terms of environmental impact, while bridging the gap between the construction process and sustainability.

According to Jose Manuel Mesa Fernandez, César Pacios Gonzalez, Valeriano Alvarez Cabal, Joaquín Villanueva Balsera [6] The number of agents involved in the construction process (which involves the fragmentation of work and the difficulty to control it), the project systems of development and contracting (whose responsibility lies with the different agents) and the peculiarities of each project (which hinder the transmission of knowledge and accumulated experiences) are examples of the difficulties that appear regularly in the development of any construction project. As a result, the appearance of defects both in the construction phase and the operational phase of buildings remain a recurrent problem.

According to K.Jaiganesh, S.Dinesh and R.Preetha [7] Housing is one of the basic needs of mankind in terms of safety, security, self esteem, social status, cultural identity, satisfaction and achievement. After analyzing various methods for low cost building systems, the best method to adopt is using natural materials, renewable materials, eco friendly building materials used, using locally available materials and minimizing the resource

allocation and innovative methods can be implemented to reduce the cost and to achieve sustainable Green building.

P.P.Mane, J.R.Patil [8] stated that the best quality, time and cost are the important aspects of successful construction project which fulfills the main goal of construction industry. The quality management has to provide the environment within which related tools, techniques and procedures can be deployed effectively leading to operational success for a construction project.

Prof. V Srinivasa Raghavan, Karthik Kumar [9] Investigated the major problems faced by small scale construction contractors true survey among the top level managers and the owners of the forms based on the reserves payments by the clients fluctuation in material cost owner's involvement in construction phase cash flow management and increased competition in the construction field there perceived to be the top five major problems faced by small scale contractors in India which hampers the quality of construction by these contractors adversely.

M. Abas, S.B. Khattak, I. Hussain, S. Maqsood, I. Ahmad [10] stated that, Good quality performance makes the construction project successful. The performance can be increased by studying and improving the factors that affect the quality significantly and suggested that the contractor should implement new technologies; build an effective risk management team as well as quality management team. Daily supervises the material as well as work. Introduce supply chain procedure.

S. Shanmugapriya, K. Subramanian [11] pointed out that quality is a business strategy for winning over customers from the competitors. Also they stated that the major reason for rework in construction is poor quality documentation strong quality culture in the firms helps in achieving customer satisfaction. continuous improvement of quality in construction projects is necessary to avoid rework and cost caused due to maintenance of the project.

Tengan Callistus, Anzagira Lee Felix, Kissi Ernest, Balaara Stephen, Anzagira Che Andrew [12] identified the factors which affect quality of construction are lack of Management commitment to continuous quality improvement, lack of training on quality for staff, lack of Management leadership, poor planning and control techniques, high level of competition, high number of competitors, poor financial control on site, resource wastage on site, lack of previous experience of contractor, lack of Technical and professional expertise and resource to perform task, lack of Education and Training to drive

the improvement process after studying all these 11 factors related with the contractors affecting quality performance of small scale construction in lack of quality training for staff was ranked first with relative importance which was followed by lack of management leadership, Lack of previous experience remained third with poor planning and control techniques and high number of competitors ranking 10th and 11th .

D. Ashokkumar [13] mainly focuses the importance and factors that affects the quality management in the execution (construction) phase. There are many factors which affect the construction quality and also increases the cost of construction due to defects in quality. quality management awareness at all levels of construction is very important for small scale companies. there are chances of minimizing material wastage workmanship wastage time wastage and indirect cost to increase the customer satisfaction.

Nurul Nadia Omar Bakri, Md Azree Othuman Mydin [14] pointed out Common types of building defects which include structural defects resulting in cracks or collapse; defective of faulty electrical wiring or lighting; defective or faulty plumbing; inadequate drainage system, faulty ventilation, cooling or heating systems; insufficient insulation for soundproofing and also inadequate fire protection suppression systems. fungus or termite or vermin infection may also be the result of a building defect. entire buildings are subjected to the various forms of defects, failures, deterioration and variation. is significant that defects and failures must be investigated intensely. Once founding out the possible causes of the defects and failures, it is imperative to distinguish how to keep away from it in the future and reduce the effect to the minimum.

Joseph T.L. Ooi, Thao T.T. Le, Nai-Jia Lee [15] suggest that although houses with good workmanship cost more to homebuyers, they also offer higher prospective returns in terms of capital appreciation to the investors. The significant premium and price appreciation associated with construction quality also imply that the housing market may not need government intervention to encourage the developers to build better housing. However, data on construction and maintenance cost are needed to empirically determine the elasticity of each effect.

Michalis Menicou, Vassos Vassiliou, Marios Charalambides and Petros Christou [16] strongly signified the industry's need to monitor and assess the quality levels of its projects in real-time. Although an immense

number of commercially software tools exist, that address a diversified portfolio of needs, none fully satisfies the aforesaid one. Likewise, the implementation of QMS and standards although helpful they are still inefficient since the actual quantification of quality, at any given point during the construction phase, is still eluding.

According to Dr. I. Patnaikuni [17] the world needs environmentally friendly sustainable housing of low cost to provide housing for the millions of needy persons both in the developed countries in general and developing countries in particular. In view of the greenhouse gas emissions and the increasing energy costs it is essential that any housing construction should take into account these factors while making the construction affordable to low income earners. Housing construction should overcome irrationality of the current method of conventional construction which is expensive and has poor thermal performance and ignores the significant environmental impact of high embodied energy of the building process. Consequently, there is a need for developing improved low-cost sustainable building techniques.

Tan Chin-Keng, Abdul-Rahman, Hamzah [18] concluded that ISO registration is mainly for marketing purpose only and has no correlation with the quality of construction also authors denoted that Implementation of quality management is greatly perceived as a mean to fulfill contractual obligations instead of satisfying the needs of clients;

As per N. Hamzah, A. Ramly, H. Salleh, N. M. Tawil, M. A. Khoiry, A. I. Che [19] the role of the consultant in giving good quality consultation can be achieved in many ways. It started with collecting all the required information to fulfil the need of clients. Then, understanding the information and process in the form of drawings and specifications precisely; and finally, the contractor can understand clearly and implements the clients' needs according to drawings and specifications prepared by the consultant.

Adnan Enshassi, Sherif Mohamed, Saleh Abushaban [20] recommended to develop human resources in the construction industry through proper and continuous training programs about construction projects performance. These programs can update participants knowledge and can assist them to be more familiar with project management techniques and processes. Owners are encouraged to facilitate payment to contractors in order to overcome delay, disputes, and claims. All managerial levels should participate in sensitive and

important decision-making. Continuous coordination and relationship between project participants are required through project life cycle for solving problems and developing project performance.

K. N. JHA & K. C. IYER [21] studied The reasons for the underperformance of the quality of Indian construction projects to suggest possible remedial measures and found out that Project manager's competence, top management support and their competence, interaction between project participants; owners' competence; and monitoring and feedback by project participants are the factors having positive contributions to achieving the desired quality level, while factors such as conflict among project participants; hostile socio-economic and climatic condition; ignorance and lack of knowledge; some project specific factors; and aggressive competition at the tender stage are found to adversely affect the quality performances of projects.

David Arditi and H. Murat Gunaydin [22] investigated the differences in the perceptions of entry-level professionals and long-time practitioners with regard to process quality in building projects and found out that there seems to be agreement between entry level professionals and long-time practitioners concerning the importance of most of the factors in relation to process quality in building construction.

REMARKS OF LITERATURE REVIEW

- Housing is one of the basic needs of mankind in terms of safety, security, self-esteem, social status, cultural identity, satisfaction and achievement.
- Quality needs to be maintained in three stages of construction that are (design, construction, and operation) of a building.
- Challenges exist of Poor construction quality requiring positive and prompt attention from stakeholders in the construction industry
- Houses with good workmanship cost more to homebuyers.
- The ill effects of non-maintenance of quality occur in its occupants physically and mentally
- innovative methods can be implemented to reduce the cost and to achieve sustainable Green building.
- contractor can understand clearly and implements the clients' needs according to drawings and specifications prepared by the consultant.
- Construction quality problems are mainly due to

problems faced by contractors in India

- Proper Construction planning is very important for maintaining quality of construction wastage reduction, labourers' efficiency and on-time material acquisition which will speed up the quick completion of the construction work.

III- CONCLUSION

The literature review reveals the need of maintaining quality of construction at all levels of construction. Mainly it is due to the hindrance of the small-scale contractors for various reasons. Non maintenance of quality in construction may affect health and safety of the residents also. No local laws are followed for construction which may be due to lack of awareness for quality maintenance during construction of houses on very small scale mostly in the outskirts of any big city. Therefore owners of the house need help to maintain the quality which is currently a common problem for small scale construction.

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