Project Management Adoption for Social Projects of Built Environment Sector

V. Ahuja[1], A. K. Ahuja[2] and J. Malik[3]

[1,2,3]School of Construction, RICS School of Built Environment, Amity University, Sector 125, Noida, 201313, INDIA;
vahuja@rics.org, aahuja@rics.org, jmalik@rics.org

ABSTRACT

Social projects of built environment sector are either planned as part of social responsibility initiatives or taken up as post disaster reconstruction/rehabilitation projects. Individually these projects are of small scale and low financial value, but collectively the national expenditure of a country on these projects is high. These projects are primarily executed by small scale construction organizations in non-formal project environment and sometimes in remote areas with locally available technology and human expertise. Thus, successful planning and implementation of these projects requires adoption of Project Management (PM) methodologies. Through global literature survey and case study approach, this paper studies the parameters impacting PM adoption in these projects. For case studies, toilet construction projects being implemented under a flagship social scheme of Government of India, the Swachh Bharat Abhiyan Scheme have been studied. Though Indian projects are studied, results would be applicable for other developing countries having similar project work environment.

INTRODUCTION

Social projects for built environment refer to the community-based construction projects planned as a part of social welfare initiatives or taken up in response to natural disasters. These projects are often in the areas of habitat, health or education, benefit the community as a whole and are not focussed on business benefits. These are a proposal of activities organized around a specific objective, to perform in a certain period of time, in a defined geographical area, for a group of beneficiaries, with the aim of solving specific problems or improving a situation (Montes-Guerra et al., 2015). These characteristics stress the need to adopt PM for successful completion and achieving objectives of these projects. But project manager is not a common role in these projects and research has also highlighted that project management in these projects is not the same as in commercial projects (HKCSS, 2013 cited in Chui-ha and Tsz-ying, 2014).

Globally, social projects for built environment sector are often funded and executed by the government departments, by corporate organizations who take up such initiatives as a part of their Corporate Social Responsibility (CSR) initiatives and by non-governmental foundations. These are facilitated by non-profit/non-governmental organizations (NGOs) and executed under the constraints of limited human resources and financial funding (Chui-ha and Tsz-ying, 2014).These projects are generally carried out in an informal manner mainly due to the small magnitude of each individual project, are based in remote areas and implemented with limited manpower and technology.

Moreover, the nature of economic assistance and the complex web of stakeholders hinders the implementation of management tools in the project cycle (Montes-Guerra et al., 2015). Thus, the adoption of PM principles for such projects are primarily restricted to basic time and cost planning, with little attention paid to the formal PM processes of pre-planning and execution. Social projects are reported to face unusual delays or even failures at times. Hence, it is important that for success of such projects, PM principles are incorporated, irrespective of the scale and location of the projects. In the recent years, some of the global organizations like U.S. based organization Construction for Change (CfC), in collaboration with NGOs have successfully incorporated construction project management in community aid projects (Construction for Change, 2014).

Swachh Bharat Abhiyan/Mission (SBM) or Clean Indian Mission is a flagship social scheme of Government of India (GoI). This national level campaign with the budget of USD 29.25 billion[1] was launched in October 2014 with an objective to accomplish the vision of a 'Clean India' by 2019 (Deshpande et al., 2015). One of the sub-objectives of the mission includes construction of individual household, public and community toilets to make the country open defecation free (ODF). The scheme includes construction of around 110 million toilets including toilet blocks, water connection and storage facility and solid waste management system. GoI has established detailed guidelines and structure for planning, implementation, reporting and post completion review of construction work of toilets. Funding for these projects is planned through Central government, respective State governments, Private Sector Participation, CSR, Beneficiary Share, Swachh Bharat Kosh (Clean India Fund), Swachh Bharat Cess (Clean India Tax), User Charges and External Assistance (SBM (U) Guidelines, 2014).

This nationwide scheme requires standard guidelines in terms of planning and implementation, but also needs to be customised for each regional location and for different stakeholders, including implementing organizations and beneficiaries. This highlights the requirement of adoption of Program Management at national level and PM at regional level for successful completion and benefits realization of this scheme.

This paper studies the construct of PM adoption for social projects through literature survey. Through case study approach, the paper analyses adoption of PM for construction of toilets under Swachh Bharat Abhiyan/Mission (SBM) and validates the constructs established through literature survey. For study of cases, their PM adoption was mapped to ten knowledge areas established by PMI. This paper documents part of the research work being conducted by authors to study sustainable adoption of PM for social projects of built environment.

LITERATURE REVIEW

Social projects of built environment can be categorized as social upliftment/ initiative projects, community aid projects, cooperation projects, international

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[1] *The conversion rate has been taken as 1 USD = 67 INR.*

development projects or similarly. In such projects, the target "customer" or beneficiary is a community being benefitted from the project output, but its members generally do not fund the project and often they do not have high technical and managerial capabilities (Golini et al., 2015). As a consequence, they are often not included in the project design phases, leading to fatal errors in the execution of the project (Golini et al., 2015). This requires exploiting local practices and skills in the design and construction of such infrastructure (Dillon, 2016). Projects are delivered by people and in projects for social good, volunteers with their knowledge, professional expertise, experience and personal networks are essential to project success. These projects are implemented through a formal construction contract or a voluntary community approach (Dillon, 2016).

In reference to International Development projects, it has been discussed that different contexts reflect different approaches towards PM and empirical evidence also shows that such projects often lack efficiency and effectiveness (Golini et al., 2015). Internal success of a project is measured in terms of achieving estimated Time, Cost and Quality and for these parameters, the performing organizations are directly accountable to donors. External success of projects is w.r.t. achieving stakeholder satisfaction in terms of involvement, long term impact and economic sustainability after the end of the project (Golini et al., 2015).

Literature shows that PMBOK (PMBOK® guide, Fifth ed., 2013) is the most referred document for PM guidelines for social projects, though the percentage of organizations applying it is low, as a high proportion of organizations use their own methodologies and logical framework approach (Montes-Guerra et al., 2015). PM tools have often a scattered adoption and tools usage at a certain stage is influenced by the use of tools at other stages. Researchers have categorized stages of tools adoption and their impact areas as shown in Table 1 (Golini et al., 2015).

Table 1: Stages of tools adoption & their impact areas

Stages	Tools
Stage 1	Progress reports, Logical framework
Stage 2 *Significant Impact on Internal Performance*	Cost accounting, GANTT diagram or project schedule, Risk analysis/management
Stage 3 *Significant Impact on External Performance*	Communication plan, Organizational chart or OBS, Milestone planning, Stakeholder matrix, Scope management, Contingency allocation, Responsibility assignment matrix
Stage 4	Work Breakdown Structure, Critical path method Issue log, Earned value management system

Results indicate that overall adoption of PM tools and techniques is low and logical framework methodology, the most widely used tool is found to be appropriate during the stage of approval and financing and also acts as a common language among stakeholders, enabling cooperation (Montes-Guerra et al., 2015). Golini et al. (2015) have explained this stage wise adoption phenomenon. At the first stage only the basic tools are adopted to receive funding, but there is a lack of knowledge of practical principles of PM and this brings to a lower performance. As the project

manager feels the need to improve performance, he or she learns to use new tools (second stage) and acquires core knowledge about PM principles and practices, strongly increasing the project's internal performance. In stages 3 and 4 there is a refinement of managerial techniques through the acquisition of new expertise, which expands the core competences acquired at stage 2. Stage 3 tools and methodologies, besides the positive effects, require additional costs and time, thus their impact on internal project performance is neutral. Though Stage 3 tools focus on addressing short-term, project-related issues, they may indirectly contribute positively to enhancing long-term performance, and thus have a strong positive impact on external performance. Research indicates that internal project performance strongly and positively affects external (strategic) performance.

Research indicates that (Montes-Guerra et al., 2015): primary objectives of these projects being meeting social objectives, and also compliance with the funding agencies, cost management and stakeholder satisfaction are important considerations; Project scope and quality, two fundamental performance variables are less important; Techniques most often used are the ones related to budget control and progress monitoring; and most widely used software is the electronic spreadsheet, and generally there are no other PM computer applications used. Use of some tools is beneficial regardless of the characteristics of the projects or size of the organization executing the project.

Parameters for adoption of PM tools and techniques are identified as (Golini et al., 2015): Private or Non-profit organization and PM maturity level of the organization implementing the project. Impact of tools adoption on project success and performance are summarized as (Golini et al., 2015, Montes-Guerra et al., 2015):
- Project managers who adopt only a small set of basic tools are likely to manage only a few small projects despite the type of project or the geographical location.
- Project managers who adopt a wider range of tools are more likely to achieve higher external and internal performances.
- Using tools would help efficiency, leading to projects being able to meet the social aspects, and also appropriate management of limited resources.

SWACHH BHARAT ABHIYAN/MISSION (SBM)

SBM launched in October, 2014 includes two sub-missions: SBM (Gramin) for rural areas and the SBM (Urban) for urban areas. At National level, this Mission is envisaged and planned as a Program with the sub-objective of making India open defecation free. This sub-objective is to be achieved by construction of around 110 million toilets across the country as per the requirements of identified beneficiaries, bringing behavioral change and capacity development of beneficiaries for effective usage, operations and maintenance of constructed toilets. School and college children have been identified as key stakeholders and potential agents of change in homes (SBM (G) Guidelines, 2014).

The total budget of the mission includes funds for IEC (Information Education and Communication), start-up activities, capacity building and also for solid/liquid waste management (SBM (G) Guidelines, 2014). The government provision for unit cost of individual household toilet is USD 179 and it's a stage based funding

(SBM (G) Guidelines, 2014). While the CSR activities are currently largely confined to financing household toilets or school toilets for girls in rural areas, Public toilets are funded through PPP models. At national level, the Swachh Bharat Cess (Tax) of 0.5 % has been levied from November 2015. Different organization structures, beneficiary identification mechanisms and funding options have been institutionalised for construction of toilets.

Program and Project Management approach has been constituted at five levels of governance, Central/State/District/Block/Gram Panchayat (GP) or Village level (SBM (G) Guidelines, 2014; Guidelines for IHHL works, 2015).

- At Central level, for SBM(G), concerned Ministry has contracted services of a Project Management Consultancy firm to support the implementation of the scheme. Indicative areas of work include: Program management, Communications, Knowledge Management, Training and Capacity Building, Monitoring and Evaluation, Social Development, Solid Liquid Waste Management/Environmental Engineering, Finance/Grant Management, IT/Web based communications and Procurement.
- Sanitation is a State subject and flexibility is provided to State governments for designing their implementation policy and mechanisms. Each State has to prepare an Implementation Framework with a road map of activities covering *Planning, Implementation and Sustainability Phases*. These plans need to be five year plans, including annual plan for each year.
- An effective monitoring mechanism has been constituted for monitoring both – Outputs (Toilet Construction) and Outcomes (Toilet usage).
- Each State has to develop a customised communication strategy, plan and material and train community mobilisers to use these tools.
- Scheme includes setting up Rural Sanitary Marts, Production Centres for availability of sanitation material in rural areas.
- Application forms and related documents to be used by locals are in local regional language
- Photographic evidence is maintained regarding progress of toilet construction and MIS has been setup for progress reporting.
- Program is to be audited as per GoI and Comptroller Auditor General's guidelines.
- Incentive for success of projects are planned to be provided to facilitating organization on per toilet basis. Two third incentive is to be released six months after completion of toilet and one third after inspection after another six months.

Beneficiaries for individual household toilets are provided a menu of options for technology, design and cost (SBM (G) Guidelines, 2014). The type of technology to be adopted in any SBM toilet project is also defined by the implementing or the funding agency.

Reports suggest that the targets are not being met. As per report of April 2016, of a target of 2.5 million household toilets in urban areas by March 2016, 24 percent (0.6 million) had been constructed. Of a target of 100,000 community and public toilet seats in urban areas by March 2016, 28 percent (28,948) had been constructed. With nearly 16 million toilets constructed over two years (in rural areas), according to the government; 95 million are still needed to be built over the next three years

to meet the government's target of making India open-defecation free by 2019 (Hindustan Times, 27 April, 2016).

There are documented technical and non-technical challenges faced by these projects, especially at the implementation level. Some of the reported challenges are (FICCI, and IPE Global, 2015): Data collection and data inconsistency arising due to the various government and non-governmental agencies working in the villages; Unauthorised habitation on the government land and inadequate space in the houses; In remote areas, availability of water and construction materials; Behavioural practice to defecate in open; Mishandling of taps, commodes etc. by the beneficiaries. There are reports that due to lack of water and sewerage connections, poor construction quality and lax maintenance, difficulties with managing faecal sludge, either some constructed toilets are not being used consistently, or people are relapsing into open defecation as the toilets become unusable (Deshpande, 2016).

CASE STUDY ANALYSIS

Case 1: Construction of Individual Household Toilet in Bahadurpur Village, Rajasthan State, India , (Model 1 as shown in Fig. 1), 2015
Most of the households of Bahadurpur village located in Rajgarh of Alwar district, Rajasthan did not have toilets at homes, leading to open defecation. Under the initiative of SBM(G), the villagers, with the help of GPs applied for the established government financial assistance of USD 179 for construction of each household toilet. Substituting this assistance with more funding from their side, the villagers were able to build household toilets just about meeting the basic recommended guidelines. Construction was carried out either by the beneficiaries themselves or by hiring a local mason with limited supervision at the GP level. One such case has been taken up for the case study where a family constructed the individual household toilet in 2015 and is presently using it. Construction of toilet and subsequent maintenance is not of required quality. *(Information collected by discussion with the beneficiary)*

Case 2: Construction of Household Toilets in Villages of State of Sikkim, India (Model 1 as shown in Fig. 1), 2013-15
With the introduction of SBM in 2014, the Sikkim government decided to make the state 100% ODF. Under this initiative, 4391 households without toilets were identified in the East Sikkim district. Sikkim being a special category state, received 90% of the funds from the central government and the rest 10% were contributed by the state government. The construction of these toilets were monitored at the Village (GP) level with technical support provided by the state engineers. By involving self-help groups and related NGOs, the GPs ensured that there was no household without toilet and open defecation was totally stopped. The construction started in 2013-14 & was completed by December 2015. State level Independent Third Party verifications were carried out from January 2016 and after necessary documentation, the state was declared ODF in March 2016. Sikkim is one of the very few states which have achieved the ODF status under SBM. (District Collector East Sikkim, 2016 and RMDD, South Sikkim, 2016)

Case 3: Construction of Individual Household Toilets at Ganesh Mala Slum, Pune, Maharashtra State, India, (Model 1 as shown in Fig. 1), 2014

NGO Shelter Associates partnered with Pune Municipal Corporation (PMCorp.) for implementing Individual Toilet Projects for the identified 81 beneficiary families. In this partnership, PMCorp. sponsored the cost of the toilet hardware and construction, while Shelter Associates was responsible for providing slum data and information on any infrastructure gaps in the drainage system, identification of the beneficiary families, monitoring and supervision of the actual toilet construction and Community Mobilization for proper utilization of the provided individual toilets. The NGO documented the post occupancy evaluation of the toilets and it was found that the toilets are being used by the beneficiaries as they have a sense of ownership. (Associates, 2015 and PM Corp. website, "Individual Toilets"*)*

Case 4: Construction of School Toilets in a District in State of Uttar Pradesh (UP), India, (Model 2c as shown in Fig. 1), 2015

A private engineering company was planning to utilise its CSR funds for construction of school toilets in UP. The company appointed a Govt. instituted apex organization/council setup to take up and promote activities for the development of the Indian construction industry for the identification of beneficiaries & implementation of the project. The Council identified seven schools requiring toilets in a District in UP State and carried out the design and construction of toilet blocks. Financial assistance was provided by the Client and the Council completed the construction of toilet blocks through its manpower & resources. The Council conducted post occupancy surveys observed that with proper training & workshops given during the construction of the toilets, the beneficiaries have been using the toilets. (*Information collected after discussion with the implementing organization*)

Case 5: Construction of School Toilets across six States in India, (Model 2c as shown in Fig. 1), 2015

An oil and gas sector Public Sector Undertaking (PSU) of the GoI was desirous to provide sanitation facilities under its CSR initiative in six states across the country. The PSU and an NGO specialising in providing social sanitation solutions entered into an agreement through which the NGO implemented the construction of 1552 school toilets across the six states & the PSU provided the financial assistance. The identification of the beneficiaries was done by the NGO through surveys and interaction with the local Authorities. The NGO carried out the construction of the toilets through its team of sanitary workers & masons headed by a Field Officer & a Supervisor. With the total project cost of USD 5.85 million, the project was completed in one year as per the scheduled timeline. The constructed toilets have a high success rate due to the active stakeholder awareness programs conducted by the NGO at pre-construction & post-construction stages. (*Information collected by discussion with the NGO*)

Each case was studied and analysed for adoption of PM tools, techniques and methodologies and these were mapped to ten knowledge areas of PM as defined in PMBOK 5th Edition. (PMBOK® guide, Fifth ed., 2013). Subsequently tools used in each case were mapped under four stages of tools adoption as identified in the literature (Table 2). Authors have also included a fifth stage of Tools adoption to which 'Post-occupancy evaluation' tool is assigned.
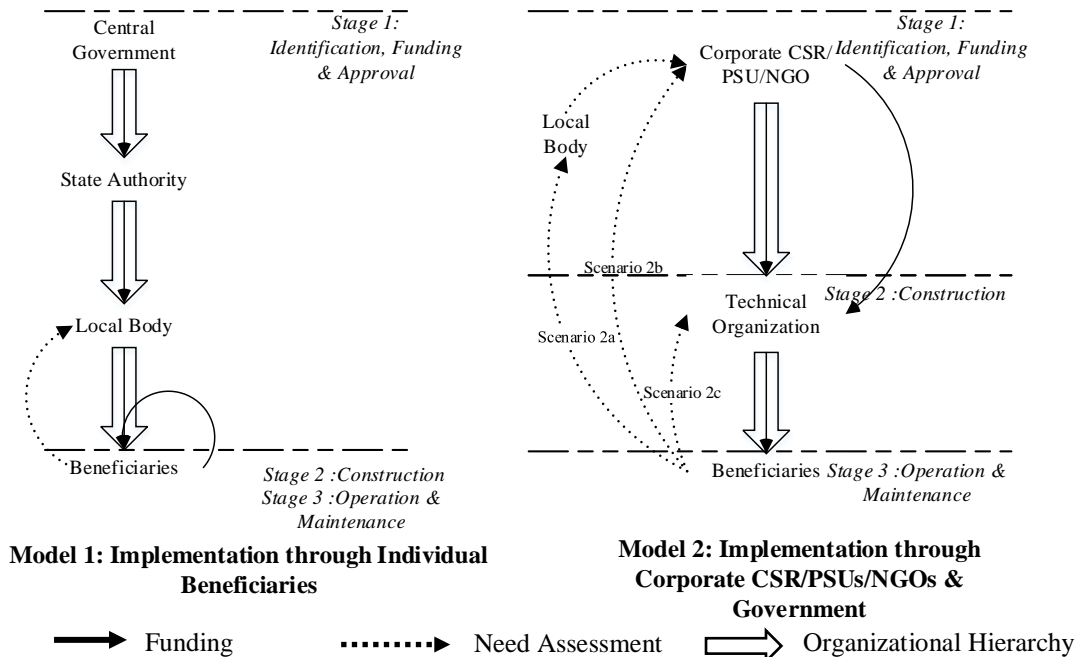
Figure 1: Models for Construction of Toilets

Model 1: Implementation through Individual Beneficiaries

Central Government → State Authority → Local Body → Beneficiaries

Stage 1: Identification, Funding & Approval
Stage 2: Construction
Stage 3: Operation & Maintenance

Model 2: Implementation through Corporate CSR/PSUs/NGOs & Government

Corporate CSR/PSU/NGO → Technical Organization → Beneficiaries
Local Body; Scenario 2a; Scenario 2b; Scenario 2c

Stage 1: Identification, Funding & Approval
Stage 2: Construction
Stage 3: Operation & Maintenance

Legend: → Funding ‥‥▶ Need Assessment ⇨ Organizational Hierarchy

Table 2: Mapping of PM tools used in each case

Tools Adopted		Case 1	Case 2	Case 3	Case 4	Case 5
Stage 1						
1	Logical Framework	☑	☑	☑	☑	☑
2	Progress Reporting	☑	☑	☐	☑	☑
3	Expert Judgement	☐	☐	☐	☐	☑
Stage 2						
1	Project Scheduling (MS Excel/MSP)	☐	☐	☐	☑	☑
2	Cost Accounting	☐	☑	☑	☑	☑
3	Scope Management (Surveys/Interviews)	☑	☑	☑	☑	☑
4	Formal Agreement/Work Order	☐	☑	☑	☑	☑
5	Inspection	☑	☑	☑	☑	☑
Stage 3						
1	Organisation Chart	☐	☐	☑	☑	☑
2	Responsibilty Matrix/Chart	☐	☑	☑	☑	☑
3	Milestone Scheduling	☑	☐	☑	☑	☑
4	Communication Plan (Meetings/visits)	☐	☐	☐	☑	☑
5	MIS Reporting	☐	☐	☐	☐	☑
6	Procurement Negotiation (Tendering)	☐	☐	☑	☐	☐
7	Quality Assurance (Third Party Audit)	☐	☑	☐	☐	☑
8	Performance Reporting (Factsheets/Report)	☑	☑	☑	☑	☑
9	Capacity Building Workshops/IEC	☐	☑	☑	☑	☑
10	Quality Control (Inspection)	☐	☑	☑	☑	☑
11	Scope Management(GIS Mapping)	☐	☐	☑	☐	☐
12	Stakeholder Analysis Matrix	☐	☐	☐	☑	☑
Stage 4						
1	Issue Log	☐	☐	☐	☐	☑
2	Work Breakdown Structure(WBS)	☐	☐	☐	☐	☐
3	Critical Path Method (CPM)	☐	☐	☐	☐	☐
4	Earned Value Management System (EVMS)	☐	☐	☐	☐	☐
Others						
1	Post Occupancy Evaluation	☐	☐	☑	☑	☑

CONCLUSIONS AND DISCUSSION

Case studies analysis shows that if the planning and implementation of social built environment projects is totally assigned to the beneficiaries, as in Case 1, PM adoption is only to fulfil the basic requirements of the guidelines and there is no assurance of internal as well as external performance. Study of similar cases and cases reported in the media, also report this scenario. Also, beneficiaries were required to augment the funding personally, which is difficult for the beneficiaries and also impacts achieving quality construction and building comprehensive facility. For a toilet facility, no/inadequate water supply or sewage management system impacts post-completion usage of the toilet, though as per the records, toilet would be constructed and would be physically existing. Case 2 and Case 3 are also examples of individual household toilets, but with structured intervention of local authorities, augmentation of funding by the authorities, as well as support by the self-help groups for changing community behaviour/behavioural practice. In Case 3, PM adoption is more matured and post-occupancy evaluation has also been conducted. Case 4 and Case 5 were implemented through CSR funds, so availability of funds was not a concern. In Case 4, the implementing agency is a construction council, with knowhow of quality construction, project management and experience of conducting skill development programs. This resulted in quality design and construction, and adoption of formal PM including progress reporting and stakeholder analysis. In Case 5, the client was an oil and gas sector PSU with matured PM adoption in their core work, contributing to establishing systems for internal success factors. The implementing NGO had experience of executing sustainable sanitation projects. Though they do not adopt formal PM methodologies, but they have structured established processes for achieving external success of projects. These factors led to internal and external success of these projects and it is the only case in which a Stage 4 tool was adopted. All cases have adopted Logical framework methodology, formal time scheduling has been done only in Cases 4 and 5, progress reporting in different formats has been done in all cases as it is a requirement of the government established system. But, other tools are not adopted in all cases.

The study indicates that structured Program Management/ Project Management approach of the government has given a framework to the projects for PM adoption. But, formally these tools are adopted if the financing, implementing or facilitating organizations have exposure to PM adoption in their core work or otherwise. Single beneficiary finds it difficult to adopt these tools. Since significant work in these projects is conducted or managed by volunteers, it is important to train volunteers in adoption of these tools. Post-completion evaluation is an important factor to validate benefits realization of these projects as it is important that projects' use is as envisaged at the planning stage. Achieving planed Outputs and Outcomes are both important as benefits realization of these projects/programs are possible only if Outcomes are also achieved.

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