Project Management and Structure

Maharashtra Emergency Earthquake Rehabilitation Project (MEERP)

Soon after the earthquake, and once the enormity of the destruction was understood, the Government of Maharashtra (GOM) began designing the massive reconstruction project officially titled the Maharashtra Emergency Earthquake Rehabilitation Project (MEERP). Housing, the project component accounting for approximately 58 percent of the total budget, included:

- Relocation of 52 completely devastated villages including reconstruction at the new sites.
- Complete reconstruction of another 22 severely damaged villages.
- Reconstruction in-situ/repair and strengthening of dwellings in over 2,400 affected villages of Maharashtra.

In addition to the housing component, MEERP included other components, such as infrastructure, economic rehabilitation, social rehabilitation, technical assistance, training, equipment, and the development of a disaster management plan for the State of Maharashtra. The total project cost was around $350 million, of which $246 million was provided by the World Bank in the form of a credit to the GOM. (Of the $246 million, $30 million was cancelled in 1997 due to currency fluctuations.)

The MEERP was launched with the following major objectives:

1. To restore the physical environment to pre-earthquake condition.
2. To enhance the earthquake resistance of buildings through improved standards of design and construction.
3. To reinforce the capability of the GOM to respond more efficiently to possible future disasters, including earthquakes.

Authority and Accountability

One of the key reasons for the success of this project was its effective management. A separate management unit was created to oversee the rebuilding effort. This unit was called the Project Management Unit (PMU), headed by the Secretary and Special Commissioner, Earthquake Rehabilitation, and staffed with administrative officers and technical professionals of the GOM with the drive, leadership, and authority necessary to achieve results. From the beginning of the project, the PMU was assisted by a wide range of consultants in such areas as project management, social development, project supervision, and quality assurance. The PMU was delegated full administrative and financial powers for program implementation. The Central Implementation Group (CIG), a special steering committee, was established at the top government level and consisted of the highest ranking government administrators, who provided guidance and took prompt action to remove obstacles throughout the program.

Management Structure

The management structure of the MEERP and the creation of the PMU evolved as a result of discussions between the World Bank and top GOM officials. The GOM assigned the highest priority to the selection of the project team, and was thus able to fill critical positions in the PMU in the initial four months following the earthquake (the PMU was officially created in November 1993).

According to the GOM (1994d), the main responsibilities of the PMU were:

1. Implement the program with the assistance of consultants, experts, and line agencies.
2. Coordinate the work of the various agencies to ensure compliance with the overall implementation schedule.
3. Supervise the work of other agencies.
4. Appoint the necessary external agents for the purpose of carrying out the work.

The World Bank team played a very important role in the creation of the PMU. According to the World Bank (1994a):

> Experience from emergency projects elsewhere in the world indicates that effective project management requires the following: (i) a strong management team with the drive, leadership, and authority; (ii) autonomy with all administrative and financial powers; (iii) a steering committee to provide guidance and prompt action to remove obstacles; (iv) availability of requisite technical inputs recruited from outside the administration; (v) fulldelegated powers to procure goods, works, and services without reference to higher levels; (vi) availability of construction management experts recruited from outside the administration; (vii) capability and capacity to monitor and report on the program, trouble shooting, and adopt corrective measures where appropriate; and (viii) an independent group of experts to undertake technical audit and quality control.

A Three-Tier Framework

The GOM introduced a three-tier institutional framework for the project management:

1. A cabinet subcommittee chaired by the Chief Minister for program policy and guidance. The committee was installed in December 1993.
2. Central Implementation Group (CIG) under the chairmanship of the Chief Secretary for monitoring and facilitation. The CIG was composed of all secretaries of the State, including the Principal Secretary (Finance), Secretary (Planning), Secretary and Special Commissioner (Earthquake Relief and Rehabilitation).
3. The Project Management Unit (PMU) was charged with the overall responsibility for implementing the program. The Secretary and Commissioner (Earthquake Relief and Rehabilitation) (SCER) headed the PMU, which was a special post created for implementing the program. The SCER was the nominated Project Director, with full administrative and financial responsibility including the approval of village and house planning, project preparation, contract awards, construction supervision, monitoring and reporting. A team of high-ranking GOM officers supported the Project Director: two chief engineers, two deputy secretaries, and a financial advisor. External project management consultants were also available to provide support in coordinating and managing the construction program, and for project monitoring and reporting.

Project Management Structure at the District Level

The institutional framework of the PMU at the district level consisted of:

1. The District Level Committee (DLC) under the chairmanship of the District Minister (in Latur and Osmanabad) for policy formulation and program guidance within the overall policy guidelines formulated by the Cabinet Subcommittee.
2. The District Level Executive Committee (DLEC), chaired by the District Collector (the highest ranking GOM civil servant at a district level). The DLEC was in charge of coordinating and monitoring the program implementation. The District Collector was also the agent of the Project Director at the district level, was in charge of providing logistical support to the PMU and was assisted by an Additional Collector who was engaged full-time on MEERP activities.
3. The field units of the PMU, comprising very large engineering units.

At the village level, the project management framework consisted of a village-level committee (VLC) headed by a Sarpanch (elected member of the Gram Panchayat, i.e. village council). The VLC provided a forum for information dissemination, progress monitoring, and dispute resolution. The VLC functioned primarily in the relocation villages. In the villages where owners participated in the repair and strengthening program, they interacted most frequently with local village functionaries who explained details of the program to them.

District Collectors are considered civil servants (i.e., members of the Indian Administrative Service—IAS) of the highest rank at a district level. As officers of the Revenue Department, they have the highest administrative powers at a district level. The collectors were directly responsible for implementation of

the repair and strengthening/reconstruction in-situ program, including the financial control over the funds to be distributed to the beneficiaries and control over the PMU Junior Engineers (JEs) working in the villages. In addition, the collectors were responsible for implementing information dissemination campaigns and hiring the community-based and womens' organizations for the project. They were also responsible for coordinating the activities of various government agencies and NGOs, monitoring the progress of the housing rehabilitation component (along with the PMU superintending engineers), and trouble-shooting problems at the village level.

PMU Engineering Field Staff

A major portion of the housing rehabilitation component was concentrated in Latur and Osmanabad, the two districts most affected by the 1993 earthquake. Consequently, the PMU decided to assign two full-fledged engineering units (cells) headquartered at the Latur and Osmanabad district centers. A superintending engineer assigned from the GOM Public Works Department and assisted by a team of five executive engineers headed each cell. Each executive engineer managed an Integrated Unit consisting of five deputy engineers and a number of JEs.

All executive engineers and deputy engineers were full-time employees of the GOM (members of either Public Works or Irrigation Departments) and were assigned to the PMU for the duration of the project implementation. As these departments were not able to assign the required number of JEs (only 173 full-time JEs were deployed from these two departments), the PMU had to hire a large number on a contractual basis. At the height of the project the total number of contract JEs working in the Latur and Osmanabad districts was about 700. The role of the PMU engineering staff in the MEERP, including their responsibilities (e.g., frequency of site inspections for various program components) and powers, was clearly defined early in the project implementation stage in a booklet prepared by the Chief Engineer & Joint Secretary, PMU (GOM, 1994e).

The PMU engineering staff members were mainly in charge of supervising the construction carried out within the housing component of the MEERP. At the beginning of 1994, they managed the construction of temporary shelters for the beneficiaries who were rendered homeless and awaiting relocation to new villages. Afterwards, they supervised the progress of the repair and strengthening program and the contractor-managed construction of the relocation villages.

It should be noted that the PMU engineers were the backbone of the repair and strengthening program. They had to prepare estimates for each of the 200,000 families, organize the information dissemination and education process related to the construction (including the use of new construction techniques), certify the use of building materials at each stage, and supervise the construction. Most of the work at a village level was done by JEs, and the supervision was provided by the seniors (especially deputy and executive engineers), who visited the villages on a regular basis.

Apart from this, the PMU engineering staff played a key role in preparing the tender documents and supervising the rebuilding or strengthening of schools and other public buildings in the Latur and Osmanabad districts damaged in the earthquake. Working for the MEERP was considered difficult in terms of the work pace (the emergency nature of the program) and the work environment (rural conditions). For many engineers, this was the first project that tested their social and communication (community mobilization) skills. As engineers played critical roles in the construction field supervision and also in providing training to local artisans involved in the construction, the PMU management recognized the importance of periodic refresher training, which they provided primarily to the JEs throughout the project implementation.

In terms of manpower requirements, the housing component of the MEERP (and especially the repair and strengthening program) required the heaviest involvement of the engineering staff of all the MEERP components. It should be noted that GOM engineers (mainly staff of the Irrigation and Public Work Departments) were also involved in the infrastructure reconstruction and rehabilitation (e.g. bridges, roads, water supply network), mainly related to the management of contracts and construction carried out by the contractors.

Project Management Information System

The Project Management Information System (PMIS) was a database management system customized to automate the data collection, data storage, and report generation of the various MEERP components. This was the first time that such data collection and report preparation were undertaken on a large scale within the GOM. The skills learned by contractors and GOM officials in developing this system are already proving useful in other projects in Maharashtra.

The PMIS should be viewed as a major innovation and skill-building activity of this rebuilding project with direct application to many other aspects of state government. The PMIS was operational for the final 3 years of the project implementation on 12 personal computer stations distributed throughout the affected region.

A Geographic Information System (GIS), which took into consideration the geographic distribution of the 2,400 villages participating in the repair and strengthening program, was also undertaken in order to help in planning, program monitoring, and resource management. The basic information that formed the GIS included (GOM, 1995c):

- Geographic location of the villages.
- Number of houses in each village and the damage category.
- Availability of water supply vs. the demand.
- Disbursement of financial assistance.
- Demand vs. availability of building materials.
- Demand vs. availability of construction labor.
- Location of material depots and stock status.

Ultimately, the GIS was not considered very successful as a tool to manage the repair and strengthening program, primarily because there were few PMU staff trained in its use and there were maintenance problems with computers in the districts. However, its limited use in this project did allow contractors and government officials to develop skills that will be very helpful in future government projects.

In addition to the PMIS, the GOM made extensive use of information technology in other project components. The PMU coordinated the development of two additional major databases: a comprehensive database of all beneficiaries in the relocation villages and a Disaster Management Information System (DMIS) (both described in later sections of this report).

Coordination with Private Sector, Donor Agencies, and Nongovernmental Organizations (NGOs)

An important element of this program was the direct involvement of the private sector as a partner with the GOM. This partnership evolved over time. Many nongovernmental organizations (NGOs) were involved in the relief phase because of the enormity of the disaster, and those that had the resources and organizational capacity remained to participate in the rehabilitation phase (Vatsa, 1999). Many private consultants also were engaged, including the very important consultancy for project management.

Contractors were engaged on a massive scale to construct the relocation villages, community participation consultants played an important role in both the relocation villages and in the repair and strengthening of villages, and technical consultants were important in designing the earthquake-resistant construction techniques and the disaster management plan. NGOs were directly involved in the construction of civic services such as hospitals, schools, and trauma centers; in the operation of various social facilities; and in the construction of some of the new villages. Most NGOs had limited resources, so the GOM provided financial support while the NGOs managed the construction. A number of corporations also participated in the program as donors.

The structure of the program defined the role of most of these private agencies, particularly the NGOs. The NGOs were active only in those villages requiring new construction on a large scale. In those villages that had a repair and strengthening program, which required contacting every household over a geographically dispersed region, the NGOs played a negligible role (Vatsa, 1999).

One of the challenging aspects of this project was the required coordination among the large number of governmental agencies and NGOs involved.

Typically, the GOM does not coordinate with such a diverse range of organizations on a single project. Thus, procedures and standards for such coordination were not in place at the time of the earthquake and had to be developed on an ad hoc basis. Many of the NGOs believed they were more familiar with the needs of the rural, largely illiterate population than was the GOM, and had strong opinions about how the rebuilding project should be structured. The GOM involved many NGOs in early discussions, as builders in some of the relocation villages, and as contractors to assist with community participation and project education. In some cases this was the first time either organization dealt with the other.

Designs of houses in the relocation villages that were constructed by donor agencies or NGOs early in the rehabilitation program (starting early in 1994) were mainly based on massive use of concrete technology. Some of these agencies used inappropriate construction practices, such as concrete frames, concrete wall panels, and prefabricated construction, but since they were not part of the government program, there was no easy mechanism to influence their chosen design or approach. Given the rural setting and the recent experience of villagers in an earthquake that caused a large number of fatalities due to the collapse of traditional stone masonry construction, the use of concrete in the houses being constructed right after the earthquake set a standard for earthquake-resistant house construction. It was very difficult for the GOM to change the attitude of the affected communities regarding the preferred "earthquake-safe" technologies at a later stage of the program, when the planning and design of government-constructed housing started.

Early in the rebuilding process the GOM did not intervene much; it did not want to give the appearance of curbing the NGOs, and it wanted to encourage the rebuilding program to proceed as quickly as possible. Later in the program, the GOM realized that house designs needed to be reviewed and all agencies had to submit their designs to either the Central Research Building Institute in Roorkee or the Indian Institute of Technology in Bombay. The designs were scrutinized only for structural features and seismic safety. In future projects, the authors recommend that the implementing agency review all housing designs (including those prepared by the donor agencies) for structural/seismic design features, cost-effectiveness, and compatibility with environmental conditions and traditional construction practices (Figure 7).

Figure 7 *Tembhi village, rebuilt by HUDCO (Housing and Urban Development Corporation, Ltd., a GOI undertaking) with financial support from the German government. It is an exemplary example of donor-managed rebuilding, with an emphasis on stone masonry and cement mortar and traditional architectural detailing. Seventy-two houses were rebuilt in three years in Tembhi village.*