Overview of Maharashtra Emergency Earthquake Rehabilitation Programme

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Abstract:-**As part of the Maharashtra Emergency Earthquake Rehabilitation Programme (MEERP), one of the mandated activities of the Government of Maharashtra is the preparation of a comprehensive multi-hazard Disaster Management Plan for the state of Maharashtra. The World Bank, UNDP and DFID (Department for International Development, UK, formerly ODA) are supporting different complementary components of this multi-faceted effort. It is an ambitious programme, with emphasis on disaster management response, disaster awareness and education. It has a State plan as the core and all the district plans of Maharashtra forming the superstructure. These disaster management plans identify administrative and technical measures essential to disaster preparedness, response action, and mitigation efforts. These plans have crystallised an implementation programme comprising a number of components which are detailed later in the section.**

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1. THE PLANNING PROCESS

- The preparation of the disaster management plans at the State and District level commenced as a result of an Action Plan which emerged during the International Workshop on Disaster Management held in May, 1995. The first step initiated in pursuance with the Action Plan was the formation of a Disaster Management Council in January 1996 to supervise the preparation of plan at the apex level. It is headed by the Chief Secretary of the State. The Disaster Management Council decided to form five subject committees focusing on earthquake, floods and cyclone, industrial and chemical hazards, epidemics and road accidents and fire. :-

Subject	Chairman of the committee
Floods and Cyclone	Secretary, Rehabilitation
Earthquake	Secretary, Earthquake Rehabilitation
Industrial and Chemical Hazards	Secretary, Industries
Road Accidents and Fire	Transport Commissioner
Epidemics	Secretary, Health

- The members of each committee comprised technical experts, professionals and representatives of voluntary agencies apart from GOM officers. The objective was to develop a plan through a wide participative and consultative process. These five committees had several rounds of meetings. These committee meetings had a widespread and enthusiastic participation. The participants brought up large a number of local disaster management and mitigation plans and studies, and a significant body of expertise in this area was identified.

- The GOM appointed national and international consultants for preparation the State Plan and for six districts-one selected from each division. The national consultant is Dr. V. G. Panwalkar, while the international consultants are Dr. Frederick Krimgold, Director of Virginia Polytechnic Institute and Ms. Marjorie Greene of EERI, California. This segment of the activity was supported by the DFID. The UNDP joined in the effort by supporting the plan preparation for remaining 25 districts through the YASHADA, Pune. A series of district and divisional meetings were organised to discuss the details of plans.

2. STRUCTURE OF DISASTER MANAGEMENT PLAN (DMP)

- In consultation with the international consultants, a structure of the Disaster Management Plan was developed. The Disaster Management Plan (DMP) has three components: (a) Risk Analysis & Vulnerability Assessment, (b) Response Plan, and (c) Mitigation Strategy. At the state and district levels, the same structure has been followed.

- The Risk Analysis and Vulnerability Assessment depicts the present picture for each disaster-exposure, loss of life, property damage, etc. It also shows geographic distribution of each hazard. The various monitoring facilities, regulatory regimes, countermeasures available for each disaster, etc. have been presented in this analysis.

- The response plan presents an organisational structure of all the state, central and non-governmental agencies to effectively deal with the disaster in a co-ordinated and quickest possible manner to mitigate the impact of disaster during and after its onset. It identifies functional areas such as relief, communications, information, transport, health services, etc., and proposes assignments to various departments, including identifying lead and supporting departments. The response plan also lays down preparedness checklists, standards of services, operating procedure guidelines, and reporting formats.

- The mitigation strategy and plan focus on the long-term planning for disaster reduction. It deals with the issues of continued commitment to hazard identification and risk assessment, applied research and technology transfer, investment-incentives for mitigation, and leadership and co-ordination for mitigation. The mitigation strategy makes an argument for better land use management, building codes, traffic standards, health standards, etc. These objectives are to be secured through disaster legislation, mitigation regulation, and incentives for mitigation.

3. INSTITUTIONAL SUPPORT TO DISASTER MANAGEMENT PLAN

- The Disaster Management Plan should have a sustained institutional support so as to facilitate its implementation on a long-term basis. The Government of Maharashtra has, therefore, set up a Disaster Management Centre in Yashwantrao Academy of Development Administration (YASHADA) Pune, with support from the Government of India. The UNDP has agreed to support this centre through the preparation of district plans, case studies, and training modules. The YASHADA is a premier Government training organisation, with adequate academic and organisational strength. The Centre will update the district plans and their information base, co-ordinate with different departments, agencies, NGOs, and train the Government personnel in implementation of the plan. It will provide a regular support to the GOM for activities related to disaster mitigation.

4. REVIEW MEETING IN WASHINGTON, 1997 - RENEWED MULTILATERAL SUPPORT TO DMP FOR IMPLEMENTATION:

- The drafts of Disaster Management Plan for the state and districts were presented before a review meeting attended by the international consultants, experts, and representatives of multilateral agencies in Washington from June 24 to June 26, 1997. The review meeting appraised the documents and appreciated the commitment shown by the GOM to the disaster planning. The World Bank and the DFID agreed to support the preparation of the plans and also agreed to extend their commitment to the implementation of the Disaster Management Plan. The World Bank agreed to provide the infrastructural support to the disaster planning, while the DFID decided to support the training and community preparedness programmes over a longer period.

5. IMPLEMENTATION STRATEGY

- After the GOM received a commitment from the World Bank and the DFID, an implementation strategy for the Disaster Management Plan was devised. The implementation strategy is based on a series of activities which provide support in the nature of infrastructure and organisational requirements. The activities include setting up of the Emergency Operations Centre in Mantralaya, District Control Rooms in all the districts, a communication network comprising of wireless (VHF) and satellite (VSAT) networks for the entire state, a computerised Disaster Management Information System through the GIS (Geographic Information System) applications, community disaster preparedness programmes and training.

6. COMMUNICATION NETWORK

- In order to put in place an appropriate communication network design to respond to the situations of disaster the GOM carried out a feasibility survey through the MELTRON for the VHF and VSAT network. On the strength of these surveys, the work of designing and commissioning the communication network has been completed. It has been proposed to link the district to all the sub-divisional and Taluka headquarters through the VHF (wireless) network. A separate VHF network has been designed for Mumbai to meet the extensive needs of the city during disaster situations. The VSAT network has been proposed for linking the Mantralaya to the divisional and

district headquarters. An amount of Rs. 250 million is being spent on this activity which is fully reimbursable by the World Bank.

7. EMERGENCY OPERATIONS CENTRE AT MANTRALAYA AND DISTRICT CONTROL ROOMS

- One of the most useful facilities being created is the setting up of a well-equipped and modern Emergency Operations Centre in Mantralaya and Divisional and District Control Rooms in all the divisions and districts of the state. These control rooms will serve as a nodal facility for directing all the operations in a disaster emergency situation. These control rooms will be supported by the communication network being commissioned under this programme. The total cost of setting up these control Rooms all over the state is Rs. 45 million, which is supported by the World Bank.

8. GIS BASED DISASTER MANAGEMENT INFORMATION SYSTEM

- A very ambitious programme that the GOM has undertaken is the creation of a Disaster Management Information System (DMIS) for the state of Maharashtra. It aims at the preparation of a comprehensive information base at the Taluka level, which would contain all the spatial and non-spatial data. It involves digitisation of these data, and the digitised mapping of all the Talukas with the resources and facilities on 1:50,000 & 1:250,000 scale. The DMIS will be used by the district administration not only for the risk analysis and vulnerability assessment, but also for organising response operations. In addition, the DMIS will have a great functional value for the resource and development planning of the district. It will be an accessible information base to be used by all the government agencies, with proper networking and updating facilities within. This activity, with its data base on all the relevant parameters, its range of applications and multiple user attributes, will be the first of its kind not only in the country, but probably in the world. The total budget for creating the DMIS for all the districts of Maharashtra except Mumbai is about Rs. 110 million, which would be met with the World Bank and the DFID assistance.

9. TRAINING & COMMUNITY PREPAREDNESS PROGRAMMES (DFID SUPPORTED)

- The GOM also proposes to take up an extensive programme of training for disaster preparedness and response. The training programmes will be designed for the officials of the government at different levels, NGOs, and elected representatives of local bodies. The Disaster Management Centre, YASHADA will play a pivotal role in developing the training literature and organisation of training programmes. In next two to three years, an intensive training schedule will be drawn up for orienting all the concerned agencies in different areas of disaster preparedness and response.

- The GOM also proposes to take up community disaster preparedness programmes on a pilot basis in different areas of the state. This programme will be implemented through the selected NGOs for identified disaster spots in the state, and is aimed at building up the mitigation measures into community life.

10. SEISMIC HAZARD MAP

- The GOM has also undertaken to prepare a seismic hazard map for the state of Maharashtra. This assignment is being carried out by the Lamont Doherty Earth Observatory, Columbia University. The seismic hazard map will be useful for micro level locational decisions and for developing proper building design regulations.

11. MANUAL FOR SEISMIC STRENGTHENING OF NON-ENGINEERED BUILDINGS :

- There are well establish I.S. codes for engineered buildings and structures which take into account the seismic factors. But the majority of buildings in the rural areas are non-engineered, with wide variations in the type of construction and the materials used therein. They are seismically unsafe and formulating a strategy for their seismic strengthening presented a major challenge. Drawing on the valuable experience gained in seismic strengthening and retrofitting of damaged houses in the earthquake-affected Latur and Osmanabad districts, the Government of Maharashtra has prepared a Manual with the help of Indian Instutute of Technology (IIT) Mumbai and international seismic expert Dr. Svetlana Brezev, for strengthening all types of non-engineered buildings in rural areas of all districts of Maharashtra on the basis of data on the types of houses compiled by the Building Materials and Technology Promotion Council of the Government of India and published in their Vulnerability Atlas.

- This Manual is profusely illustrated in colour and is written in a very simple, easy to understand way and can serve as a valuable handbook for

engineers, administrators and general public for taking up seismic strengthening of non-engineered houses. It is hoped that this Manual will be received as a popular set of guidelines on quake-resistant technology and would contribute significantly to provide a new dimension to housing technology in rural Maharashtra.

- This Manual is the first of its kind in India.

12. GOM'S SUSTAINED COMMITMENT TO DMP

- The Disaster Management Plan for the state of Maharashtra thus emerges as one of the most comprehensive programmes in an area which impinges on human life and society so closely. With the continued support of all the multilateral agencies and NGOs, this programme will be a great example of partnership in this vital area.

13. DFID'S RENEWED SUPPORT :

- Considering the continued support and commitment of the GOM to put in place an effective Disaster Management Plan at the state and district level, the DFID has committed a sum of pound sterling 2.5 million for a period of three years to ensure that the GOM's Disaster Management Plan is sustainable and responsive to the needs of the poorest and most vulnerable groups.

- The following three programmes have been selected because of their strategic importance within the overall Disaster Management Plan. These programmes aim to build capacity and participation in the Disaster Management Plan. The three focus areas which make up the sub-project components are:

    - Community Vulnerability Reduction Programme (CVRP)
    - Disaster Management Training Programme (DMTP)
    - Disaster Management Information System (DMIS)

The Latur earthquake was felt at 6.4 on the Richter scale at Killari in Latur district of the Marathwada region as the epicentre, at 3.56 a.m.,on the 30th September 1993. The tremour resulted in loss of lives of 7,928 persons, injury to 16,000 persons and death of over 15,800 livestock. The damage was remarkably extensive in 52 villages of Latur and Osmanabad districts, but the impact of the disaster was spread in other 2500 villages in the neighbouring 11 districts. The total property loss was estimated to be more than Rs.1100 crores.

The Disaster Response
As a part of disaster management programme the Maharashtra Emergency Earthquake Rehabilitation Project (MEERP) was launched in 1993.It was supported by the World Bank, United Nations Development Program (UNDP) as well as several bilateral donor agencies. With the purpose of recovery and mitigation of the disaster they supported the affected people by providing rescue, relief and rehabilitation.

The management policy adopted by the state government to reconstruct the disaster-affected economy is supported by a number of NGOs, private initiatives and the community. The project initiated by the state government for the purpose of rehabilitation is the largest rehabilitation package in India. The main aim of the project is to provide proper socio-economic rehabilitation of the affected people along with sustainable development as a whole.

The comprehensive strategies taken by the government include relocation of 52 severely damaged villages, reconstruction and repair of damaged houses and strengthening the undamaged houses by implementing earthquake-resistant building techniques. For relocating the severely damaged villages they have taken the help of remote sensing technique beside the consultative process side by side.

As a result of such initiatives the public utilities and infrastructure facilities are repaired and strengthened. The basic utility goods which support the primary, sustainable occupations of the poverty-stricken inhabitants of the affected area are modified and improved. For the sake of socio-economic rehabilitation special facilities are provided for the women and handicapped persons. Special training programmes are provided for the village artisans and civil engineers to make them familiar with the earthquake-resistant building designs and techniques.

DIFFERENT DIMENSIONS OF THE RESPONSE

The response for disaster management was multi-dimensional. The strategies were mainly based on three types of plans:

1. Communication Network,
2. State Disaster Management Plan,
3. District Disaster Management Plan.

COMMUNICATION NETWORK

A side-wide communication network is being set up as part of the Maharashtra Emrgency Earthquake Rehabilitation Programme. This network of telecommunication and information technology consists of an Emergency Operations Centre (Central Control Room) at Mantralaya, Mumbai, a standby Control Room at the Centre for Disaster Management, YASHADA, Pune, Control Rooms at each of the six divisional headquarters, and District Control Rooms at each district collectorate. This network is connected with VSAT telecommunication facilities for data, voice and information exchange and video teleconferencing. In a second level of communication network all tahsils are linked together through a VHF Wireless Network with nodes of the District Control Room reaching each tahsil headquarters. The following maps (figure 1 & 2) indicate the spread of the VHF wireless network in the districts and the VSAT network in the state.

This telecommunication network will facilitate video-teleconferencing among the nodes for more purposive and successful monitoring and management of such disaster. VHP Network is used to link the subdivisional and taluka headquarters with the respective district headquarters. Some up-to-date amenities like wireless base stations, mobile sets and walkie-talkie units are provided to the sub-divisional officers to improvise the contact with District Control Room.

STATE DISASTER MANAGEMENT PLAN

Maharashtra is the first state to prepare a comprehensive State Disaster Management Plan and also undertake risk assessment and vulnerability analysis of the state. These studies address the vulnerability of various districts, talukas within these districts, and clusters of villages in these districts to earthquakes, floods and cyclones, epidemics, road accidents and fire, and chemical and industrial disasters. A separate volume on Standard Operating Procedures, details the manuals for various departments to be activated during an emergency.

MAHARASHTRA DISASTER MANAGEMENT PLAN - AN OVERVIEW

In the District Control Room, the following desks are recommended to be set up for improving the capability of the district administration to respond to disasters more effectively : Operations disk, Service desk, Infrastructure desk, Health desk, Logistics desk, Agriculture desk, Communication and Information Management desk and Resources desk. Detailed instructions have been provided to the district administration about the setting up of the District Control Room and the VHF wireless network, linking all tahsil headquarters to the District Control Room.

The involvement of the NGOs and community-based organisations like Tarun Mandals, Mahila Mandals, etc., is very vital for the smooth implementation of the District Disaster Management Plans. New institutional mechanisms for community participation have been envisaged in the plans, like the setting up of the Community Emergency Response Teams, Mutual Aid and Response Groups, etc. Community participation is also sought in generating greater awareness about the nature of each disaster, the type of damage that can occur, and the stress it would generate, both at the family as well as the community level, and also the mobilisation of communities to adopt risk reduction strategies and practices, based on the coping strategies of stakeholders in similar disaster-prone contexts.

DISTRICT DISASTER MANAGEMENT PLAN

The Government of Maharashtra identified one district from each of the six revenue divisions for preparing the multi-hazard response plans, with financial support from the ODA, UK. This was also supplemented with the preparation of multi-hazard response plans for the remaining 25 districts, with financial support from the UNDP, through the Centre for Disaster Management at YASHADA. These multi-hazard response plans include an exhaustive risk assessment and vulnerability analysis of the district, with reference to earthquakes, floods and cyclones, epidemics, road accidents and fire, and chemical and industrial disasters. They also contain the multi-hazard response structure, capability analysis, including an inventory of resources, and mitigation strategies, apart from a directory of personnel and institutions in the districts with their contact addresses, telephone and fax numbers. The response structure at the state level is mentioned in the figure.

DISASTER MANAGEMENT INFORMATION SYSTEM

As a part of these multi-hazard response plans, the maps of the districts with taluka-wise and village-wise details were prepared using ARCINFO, for developing a comprehensive Disaster Management Information System (DMIS) by the Maharashtra Remote Sensing Applications Centre(MRSAC), Nagpur. This Geographic Information System (GIS) operates as a front-end with a disaster management database, providing it flexibility to respond to user queries regarding village specific details of availability of infrastructure.

This integrated facility of multi-hazard response plans, communication network, GIS and Disaster geomorphology,

geophysical data and data on climate like rainfall pattern, temperature, wind Management Information System, can enhance the level of preparedness of the district administration and also improve the capability of the district machinery to respond to disasters more effectively. The thematic data on natural resources are, like slope, soils, geology, land use, land cover, drainage network, surface reservoirs, hydro-, humidity etc. The non-spatial data consists of administrative setup, socio-economic and demographic profile of the population, water resources, irrigation, health facilities, educational infrastructure, animal husbandry, agriculture, power, infrastructure, industry, fisheries, public distribution system, tourism, etc. All the villages in the state have been assessed for the availability of various facilities listed above and their infrastructure capabilities have been mapped and included in the database to permit querying.

MITIGATION MEASURES

All districts have identified resource gaps while undertaking an inventory of existing resources in each district, to improve the preparedness and capability of the district administration in responding more effectively to future disasters. Structural mitigation measures like strengthening of government and public buildings have already been initiated. It is proposed to set up fire brigades in strategic municipal towns where such facilities have not been available for a very long time, and where the risk assessment studies indicate that several neigh bouring areas are prone to fires, based on past episodes. Non-structural mitigation measures like the modification in zoning for irrigation and building codes, earthquake-resistant construction for non-engineered buildings, etc., have also been initiated.

The construction of adequate speed breakers, caution signboards and guard-stones on highways, the setting up of Traffic-Aid posts at strategic locations, trauma care facilities in district hospitals, bypass roads, identification of accident-prone spots, improvement and strengthening of roads and bridges, etc., are also being carried out, to improve the preparedness of the district administration to respond to disasters more effectively.

A District Disaster Management Committee assists the District Collector in every districts, in reviewing the threat of various disasters, assessing the vulnerability of the district, evaluating the preparedness, and considering suggestions for improvement of the district disaster management plan.

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