



A Multidisciplinary Indexed International Research Journal



ISSN : 2320-3714
Volume : VIII



ADHYAYAN
INTERNATIONAL
RESEARCH
ORGANISATION



ANALYSIS ON NATIONAL DISASTER MANAGEMENT INFORMATION SYSTEM

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ABSTRACT:

The importance of effective management of information is being increasingly recognized in the disaster management sector in India. A number of countries have set up disaster management information systems according to their own specific needs.

Keywords: *information, disaster management, information systems*

1. INTRODUCTION

India's geo-climatic conditions as well as its high degree of socio-economic vulnerability, makes it one of the most disaster prone country in the world. A disaster is an extreme disruption of the functioning of a society that causes widespread human, material, or environmental losses that exceed the ability of the affected society to cope with its own resources. Disasters are sometimes classified according to whether they are "natural" disasters, or "human-made" disasters. For example, disasters caused by floods, droughts, tidal waves and earth tremors are generally considered "natural disasters." Disasters caused by chemical or industrial accidents, environmental pollution, transport accidents and political unrest are classified as "human-made" or "human induced" disasters since they are the direct result of human action.

A more modern and social understanding of disasters, however, views this

distinction as artificial since most disasters result from the action or inaction of people and their social and economic structures. This happens by people living in ways that degrade their environment, developing and over populating urban centres, or creating and perpetuating social and economic systems. Communities and population settled in areas susceptible to the impact of a raging river or the violent tremors of the earth are placed in situations of high vulnerability because of their socio-economic conditions. This is compounded by every aspect of nature being subject to seasonal, annual and sudden fluctuations and also due to the unpredictability of the timing, frequency and magnitude of occurrence of the disasters.

2. REVIEW OF LITERATURES

Disasters are not new to mankind. They have been the constant, though inconvenient, companions of the human

beings since time immemorial. Disasters can be natural or human made. Earthquake, cyclone, hailstorm, cloud-burst, landslide, soil erosion, snow avalanche, flood etc. are the examples of natural disasters while fire, epidemics, road, air, rail accidents and leakages of chemicals/ nuclear installations etc. fall under the category of human-made disasters [1].

Disasters - natural or human-made are common throughout the world. Disasters continue to occur without warning and are perceived to be on an increase in their magnitude, complexity, frequency and economic impact. Hazards pose threats to people and assume serious proportions in the under developed countries with dense population. During the second half of the 20th century, more than 200 worst natural disasters occurred in the different parts of the world and claimed lives of around 1.4 million people. Losses due to natural disasters are 20 times greater (as % of GDP) in the developing countries than in industrialized one. Asia tops the list of casualties due to natural disasters [2-3].

Hazard is defined as an incident, which occurs in a sudden manner, and complex in its nature and that causes losses of lives, damages to property or natural environment and bring a deep effect to local activities. Such incident needs a management that involving extensive, resources, equipment, skills and man power from many agencies with an effective coordination, which is possibly demanding a complex action and would take a long time. While the vulnerability varies from region to region, a large part of the country is exposed to such natural hazards, which often turn into disasters

causing significant disruption of socio-economic life of communities leading to loss of life and property (BMTPC, 2001)[4-5]. For natural disaster contingency, it is very important during the development and implementation of the application software to have strong management commitment and cooperation. Many projects on hazard management; contingency planning and decision support systems are implemented for natural disasters in the entire world according to geographical situations and disasters involve. For each disaster, too many database and software have been developed and designed and millions of money has been expended. These projects are substantially costly and the main problem are the existing of many parallel sub-systems and activities and repeat labour works in different database format which have to be created for each hazard management systems. Such methodology will be so complicated due to implementation of different platform, different database format, and different program languages and so on. This will make all projects costly and non-efficient. Our proposed new contingency planner for hazards is a batch system (Figure 1) containing, Data Distribution Center (DDC); Data Validation Center (DVC); Data Processing and Application Development (DPAD); and Decision Support System (DSS). This combined organization makes a natural disaster data and information management system and can be employed for national hazard contingency as a solution for all different hazards in countries involved [6-9].

3. Components of a National Disaster Management Information System

Key components of a Disaster Management Information System would be a database of

- a) Hazard Assessment Mapping
- b) Vulnerability Assessment
- c) Demographic Distribution
- d) Infrastructure, Lifelines and Critical Facilities
- e) Logistics and Transportation Routes
- f) Human and Material Response Resources
- g) Communication Facilities

The usage of Disaster Management Information Systems (DMIS) would be in 3 contexts · Preparedness planning · Mitigation · Response & recovery The hazard and vulnerability assessments and mapping components of a DMIS are the cornerstone of preparedness planning as well as planning and implementation of a mitigation program. All data is of critical use in the preparedness plan as well as in the actual response operations. It must be recognized that the development of these databases in country has to be built bottom up from the lowest administrative unit in country i.e. the sub-district and district corresponding to the level of the disaster preparedness plan. The district databases would feed into the state/provincial database and then into the national database.

National Natural Disaster Knowledge Network: In 1999, the Government of India has established a high-powered committee to address the multiple facets of

natural disasters in India. One of its major decisions in 2000 has been to set up a National Natural Disaster Knowledge Network (Nanadisk-Net). This Knowledge Network is being planned as a "network of networks". It will be a platform to facilitate an interactive dialogue with all government departments, research institutions, universities, community-based organizations and even individuals. The network will act as a digital library service and will facilitate access to global databases and early warning systems in a significant way. The Knowledge Network is designed to give a fillip to technical cooperation among developing countries and to expand international relationships to include exchange of information and transfer of technology. Nanadisk-Net will also promote e-training and will have the feature of many languages through a translation software. (b)Vulnerability Atlas of India: In 1997 the Government of India, Ministry of Urban Affairs & Employment constituted an Expert Group to prepare a Vulnerability Atlas taking into account three natural hazards which are the most common and damaging to India, namely earthquakes, cyclones and floods. The zoning maps on macro level for the three hazards are available on small scale for the country as a whole. To make this information readily available to the planners, administrators and disaster managers, these maps were prepared on larger scale, state-wise, showing all the administrative units, namely, the district boundaries, for easy identification of the areas covered by the zones of various intensity levels.

The Vulnerability Atlas contains the following information for each State and Union Territory of India:

- (1) Seismic hazard map
- (2) Cyclone and wind hazard map
- (3) flood prone area map
- (4) Housing stock vulnerability table for each district, indicating for each house type, the level of risk to which it could be subjected sometime in the future.

The Vulnerability Atlas has been published by the Building Materials and Technology Promotion Council (BMTPC) and is an important input into the State level Disaster Management Planning. Given that a DMIS would require digitization and information collection on key indicators at various levels, the Atlas is an important step in the establishment of DMIS and represents the kind of work required to be done in each country. (c) State Level Disaster Management Communication, Network and Information System in Maharashtra, India The Maharashtra Emergency Earthquake Rehabilitation Program (MEERP) implemented from 1995-1998 after the Latur Earthquake, India with World Bank funding included a component of developing a Disaster Management Plan for the State of Maharashtra supported by a communication network and DMIS. The Communication Network comprised of (1) State Level VSAT network, (2) Intra District VHF Network. The VSAT network with 37 fixed network stations in each District Control Room (DCR) provides a direct link with a variety of Telecom services linking each DCR with the State level EOC including video conferencing facilities. The VHF network has been established within 11 districts of the State, comprises 600 base stations, 56

repeater stations and 190 mobile stations. The GIS-based Disaster Management Information System was created on 1:250,000 and 1:50,000 scale for all the districts of Maharashtra. The creation of DMIS was primarily meant to compile, store and update information related to hazards, facilitating integrated analysis of the spatial and non-spatial data and generation of hazard maps for flood and epidemics, earthquake, accidents, industrial hazards, fire and cyclone. The Government of Maharashtra assigned the work of creating the DMIS to the Maharashtra Remote Sensing Applications Centre (MRSAC), Nagpur. The DMIS on 1:250,000 scale for all the districts has been completed. The digitization of data on 1:50,000 scale has been completed for 17 districts. In a second phase, the digitization of remaining districts will be completed and elaborate query design too will be taken up. The MRSAC secured the remote sensing data from the National Remote Sensing Applications Centre, and got it interpreted through a number of sub-contractors in the private sector. Once the thematic maps were made available, the experts checked these maps and validated it with the ground level findings. After the validation, the digitization of these maps would be done in the MRSAC, and the physical and socio-economic data attributed to the maps. Another round of validation takes place, before the database is finally approved.

CONCLUSION

The important inputs in this exercise are the remote sensing maps and physical and socioeconomic data. Further, it required an intensive work to digitize these data, and validate them. Though the primary

objective of the DMIS is to plan for disasters, the database has been organized in such a way that it could be extensively utilized for resource planning. A number of departments, like the Water Supply, Water Conservation, PWD, Forests, etc. are using the database for their own applications. The Maharashtra program is a forerunner of such a program at the national level and has become a model for other states in the country. A similar program is now under implementation in the state of Uttar Pradesh. Significantly it was implemented in the course of an externally funded rehabilitation program, and linked to a program of undertaking state and district level disaster preparedness plans.

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