



Towards a Disaster Resilient Community in Gujarat



GoI-UNDP Disaster Risk Management Programme



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FOREWORD

Communities at the centre of disaster risk management, Gujarat leads the way

Improving the lives of people living in areas prone to disasters remains a concern for everyone. This is why UNDP supports the Government of India to move beyond 'need-of-the-hour' efforts to help communities protect their development gains when disaster strikes.

After the devastating earthquake in Gujarat (2001), UNDP supported the State Government to establish the Transition Recovery Approach. At the heart of this approach was the idea that communities should play a central role in managing and reducing the risks that future disasters may bring. Through this initiative the Government brought communities into decision-making process like: setting-up viable hazard shelters, recovering livelihoods, and developing local preparedness plans, as well as amending legislation and policies.

The Government realized the need to involve communities, to a much greater extent, in managing the risk of disasters. They drew on UNDP to support a new national Disaster Risk Management Programme. Today this initiative works in 169 districts across 17 States prone to numerous hazards. One of these States is Gujarat. I am proud to present this publication, which documents the 'good practices' developed under this programme in Gujarat. You will find information about how communities participated in State and local planning to prepare and respond to a range of hazards. When the major floods hit Gujarat in 2006, this work really showed results.

With new disaster management mechanisms in place, the Government and communities were able to respond immediately. For example: early warning alerts that the Tapi river was overflowing, spread by the village disaster management teams, enabled people at risk to move to safe shelters in time. People trained in emergency life support rescued and saved lives in marooned villages. Meanwhile, village teams and district administrators coordinated their efforts and quickly supplied food, medicine, and water to people in need.

This programme, like all good initiatives, is the result of hard work, creativity and skills contributed by a wide range of institutions, organizations and individuals. In this case these include: The State Government of Gujarat, Gujarat State Disaster Management Authority, UNDP programme staff, national United Nations Volunteers, and the thousands of communities involved. I would like to thank them all for their hard work.

I would like to thank: the European Union, United States Agency for International Development, United Kingdom Department for International Development, Government of Japan (through UN trust fund), Humanitarian Aid Department of the European Commission and Australian Agency for International Development. These valuable partnerships have made this programme possible.

As we learn more and more about effective disaster risk management in India, Government Officials have told us that a lasting impact of this programme is the renewed motivation of communities to be better prepared. Therefore, UNDP looks forward to continuing its work with the Government of India in this critical area.



Jo Scherer
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We gratefully acknowledge the continued support extended by the partners, under the multi-donor framework of the DRM programme in India. These include the European Union (EU), the United States Agency for International Development (USAID) the UK Department for International Development (DFID), the Government of Japan (through the UN Trust Fund), Humanitarian Aid Department of the European Commission (ECHO) and the Australian Agency for International Development (AusAid). Their contribution has been greatly useful in expanding the scope and reach of the Government of India driven DRM initiative.



Strengths of Gujarat

INTRODUCTION

1.1 GUJARAT: PHYSICAL AND DEMOGRAPHIC PROFILE

Gujarat is situated on the north-west coast of India bordered by the Arabian Sea in the west, state of Rajasthan in the north and north-east and by Maharashtra in the south and south-east. The State shares an international border with Pakistan on the north-western fringe. The two deserts, one north of Kachchh and the other between Kachchh and mainland Gujarat, are saline wastelands. The State covers a geographical area of 1,96,000 sq. kms. Its coastline runs along 1600 kilometres, the longest among all the Indian States.

For administrative purposes, Gujarat State has 25 districts, 226 talukas (talukas /blocks are administrative units within a district), 18,618 villages and 242 cities/towns. The State has a population of over 50 million (5.07 crore) with a decadal growth rate of 22.66 percent compared to the national rate of 21.53 percent (Census of India 2001). Sex ratio stands at 920 females per 1000 males, lower than the national average of 933.

The State's average population density is 258 persons per sq. km compared to the national average density of 325 persons per sq. km. Disadvantaged groups like Scheduled Castes (SCs) and Scheduled Tribes (STs) make up 7.09 and 14.76 percent of the population respectively. The urban population of the State is 37.36 percent as compared to the national average of 27.82 percent. Literacy rate stands at 69.14 percent, higher than the national rate of 64.80 percent, with female literacy at 57.80 percent and male literacy at 79.66 percent.

1.2 GUJARAT: WHAT IS AT STAKE WHEN A DISASTER STRIKES

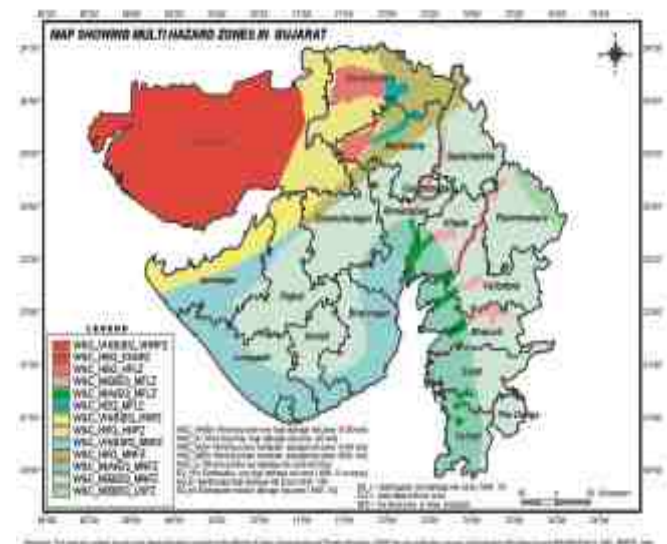
Gujarat is among the most developed and prosperous states in India. It has a higher per capita income at current prices of 28,355 INR per annum in 2004-05 compared to the national per capita income of 23,241 INR. The per capita Gross State Domestic Product (GSDP) is 33,380 INR in 2004-2005. The average size of land holdings in Gujarat is 2.62 hectares (1995-96) higher than the national figure of 1.41 hectares. Of the total groundnut production in India, 42.37 percent comes from Gujarat while its contribution in cotton is 22.77 percent and in oilseeds is 18.22 percent.

Animal husbandry and dairy business play a vital role in Gujarat's rural economy. According to the Livestock

Census 2003, buffaloes in Gujarat constitute 7.29 percent of the national numbers. The State has a similar share in national milk production, producing 6.75 million tonnes annually (2004-05).

Industries and mining are, however, the revenue churners for Gujarat's economy. As per the provisional results of the Annual Survey of Industries 2003-04, the value of output at the current prices of all registered factories covered in the survey is 2,073,160 million (2,07,316 Crore) INR¹.

Some indicators of the higher purchasing power of people in Gujarat and its developed infrastructure are the high independent mobility - one in every ten owns



a two-wheeler. Television-density too is high with 10.66 percent access, compared with the national average of 8.95 percent (March 2005). Telephone connections (Fixed +Wireless in Local Loop) number above 2.7 million (27 lakhs) and cellular phone usage is growing exponentially. Pegged at nearly 4 million (40 lakhs) in November 2005, it grew at 52 percent over the previous year (Source: Cellular Operators Association of India). At this rate of growth, on a conservative estimate, more than 6.5 million (65 lakh) cell phones are presently in operation in Gujarat, meaning one of nine persons has a cell phone.

It may be mentioned here that private cable television channels available in remote villages through Direct to Home (DtH) and cell phones had been used as a major mode of communication for disseminating early warning messages especially during the floods in Gujarat in 2006. Of the total 18,618 villages in the State, a total of 17,947 had been electrified by March 2005. Gujarat has a very well developed road infrastructure too.

1.3 WHAT DISASTERS TOOK AWAY?

The high level of development in the State has been achieved with great efforts, sustained investments as well as political will and public commitment, over the years. Unfortunately, one Bhuj earthquake or a Gujarat Cyclone has the potential to set back the development clock by a decade or more and erode developmental gains. The disaster in Bhuj not only resulted in a loss of 13,805 lives and 1,67,000 injured people but also damaged about a million houses, half that many classrooms and 5000 health units. Direct losses were assessed at 1,53,083 million INR; indirect losses at 30,476 million INR and tertiary losses were pegged at 1,00,670 million INR².

Less than four years earlier in 1998, the Gujarat Cyclone had wrecked similar havoc. It struck the coast of Gujarat near the port of Kandla at a velocity of 170 to 200 kilometres per hour, followed by a tidal surge as high as 25 feet. Six million people in 2,938 villages of 82 talukas in 18 districts were affected. Loss of human lives numbered 1241 and 21,993 heads of cattle perished, spelling loss of livelihood to thousands of rural families. Damages ran into an estimated 21,699 million INR³.

Gujarat is inherently susceptible to riverine and flash floods, cyclones, earthquakes and droughts. These disasters occur with alarming regularity. Its coastal terrain, high seismicity due to its location adjacent to inter-plate boundary and riverine nature are to a large extent responsible for its multi-hazard profile. On an average, about five to six tropical cyclones are formed in the Bay of Bengal and Arabian Sea every year, of which two to three tropical cyclones may have the probability to be of severe intensity.

Gujarat's level of risk

Area of Seismic zones

Zone V	-	18.6%
Zone IV	-	13.2%
Zone III	-	67.3%
Zone II	-	0.9%

Area prone to Wind and Cyclone

55-50 m/s	-	18.6% Wind Velocity (m/s)
47 m/s	-	15.7% Wind Velocity (m/s)
44-39 m/s	-	64.6% Wind Velocity (m/s)
33 m/s	-	33% Wind Velocity (m/s)

Flood Prone Area–10.3%

Source: Vulnerability Atlas India 2006 BMTPC

1.4 PARADIGM SHIFT IN DISASTER MANAGEMENT

A trail of colossal losses (Gujarat Cyclone in 1998, the Orissa Super Cyclone in 1999 and the Bhuj Earthquake in 2001) led to a re-appraisal of the traditional response and relief driven approach and resulted in the evolution and adoption of a holistic and comprehensive approach to Disaster Management



Search and Rescue Training

(DM). The holistic approach focused on hazard specific preparedness, mitigation and preventive measures being undertaken at all levels including the community, which is most affected by such incidents and are the first responders.

1.5 GUJARAT: INSTITUTIONALIZATION OF DM

The GSDM Act 2003 and the Gujarat State Disaster Management (GSDM) Policy form the bedrock of institutionalization. The GSDM Act (2003) provides a legal and regulatory framework for disaster management in the State. It spells out the duties of the Government of Gujarat, GSDMA, District Collector/Magistrate, local self-governments and communities in all phases of disasters.

The GSDM Policy has put in place a proactive disaster mitigation and risk reduction approach. It has identified hazard mitigation, vulnerability reduction, capacity building and integration of development planning with disaster management, as part of a long-term strategy. The Policy defines clear roles and responsibilities for all the stakeholders in various phases of disaster management.

Beyond these, revisions and amendments have been made in the General Development Control Regulations and the Town Planning Act and Land Use Planning. GSDMA has developed technical guidelines for reconstruction and retrofitting and is ensuring their implementation through massive awareness drives



Advance Flood Rescue Training, along the Banks of Narmada River, Baroda

and capacity building of technical personnel. Masons training (including women masons in small numbers) in disaster resistant housing constructions is yet another step towards sustainability of the DRM programme.

The Standard Operating Procedures (SOPs) are other steps towards institutionalization and sustainability. The District Collector, Junagadh Mr. Ashwini Kumar says that awareness about SOPs has percolated at the district level. Responses at every level are now structured and institutionalized. The liaison officers in the rank of Deputy Collector does a regular analysis of the situation and the subordinate officers posted in the blocks, updates the Deputy Collector in case of emergencies. At the administrative level, the GSDM Act 2003, has been instrumental in enforcing attendance (at places of posting when early warning is announced) and adherence to SOPs. The GSDM Act (2003) provides that, Show Cause notices are liable to be issued to the government officers for negligence of duty during on-going disasters. The Incident Command System (ICS), on implementation will further improve institutionalization.

The CEO of GSDMA states that they did not face difficulty in implementing the Gujarat State Disaster Management Act, which was prepared in consultation with the departments such as Health and Family Welfare, Water Resources and other related departments. It is true that some departments took

time to comply with GSDM Act. He cited that though the Forest Department is not having its Response Management Plan, even though forest fires are a recurring eventuality. In the absence of such departmental DM plans, the onus goes back to the District Collector.

There may be a few laggards, but overall the institutionalization process of DRM is now built into the system. CEO, GSDMA however expresses some reservations when he says that, "at the grassroot levels awareness generation has taken place, but at the State level, DRM is still a very silent programme." Many departments still need to be more sensitized to a satisfactory level, he feels.

Among the statutory provisions under the GSDM Act (2003), the preparation of DM plans is mandatory at all levels, which in effect ensures institutionalization. The Government of Gujarat, through a resolution has formed a Crisis Management Group, comprised of a selected group of the key players at the districts and the state level. DM is now an agenda of the District Coordination Committee meetings, which takes place every third Saturday of the month. DM is also on the agenda in the monthly revenue officers and monthly Panchayat officers meetings at the taluka/block level. DM is now a mandatory discussion subject during the Gram Sabha meetings (village level meetings of local self government officials and the village community, approximately held once in every six months).

Apart from such steps at the administrative level, DM has been included in the course curriculum of Primary Teachers' College, Civil Engineers' Curriculum, in the standard Eighth school syllabus, in the post-graduation course started by University of Bhavnagar and Sardar Patel University and in the intermediate college of North Gujarat University.

One of the major contributions of the GoI-UNDP DRM programme in Gujarat, has been towards laying the groundwork for institutionalization and sustainability in the initial stages, by providing technical expertise. In the formative stages of State Disaster Resource Network (SDRN), online resource inventory, the working group including SPO and IT team of UNDP, were major contributors in preparing the formats for information collection at all administrative levels. These formats were then shared with the government officials who had experience of working in post-disaster situations.

Experts on disasters and IT were also deputed at the pre-finalisation stage. At the third stage, the Taluka Disaster Management Plan (TDMP) format was first finalized and launched on GSWAN. Liaison Officers were appointed in each taluka to collect plan information on the printed formats. The information was fed into the SDRN at the Taluka Headquarters. By December 2003, database of 15,000 villages had been collated. Today 8 million (80 lakh) entries have been made on the SDRN about VDMPs only. UNDP teams contributed towards collating the statistical data on SDRN too.

Developing manuals with guidelines for data collection, analysis and the process of data entry and operation on the SDRN were done by the UNDP team. These manuals were indispensable tools for district and block level government officials, who are the key persons for disaster management.

However, if some structural changes are affected, the DRM programme is sustainable in Gujarat.



Trained Women Masons

Involvement of NGOs and CBOs needs to be stepped up. More women SHG formations could serve a dual purpose - that of improving the gender participation in the programme, as well as making these groups a medium for other DRM activities.

One felt concerned about the fact was that the DRM issues still remain somewhat secondary as some amount of prodding is still necessary at almost all levels. When disasters recede they also do so from peoples' minds. However, sustainability prospects of the DRM programme look positive.

1.6 GUJARAT: DRM PROGRAMME

The Ministry of Home Affairs, Government of India, and United Nations Development Programme (UNDP) jointly initiated the Disaster Risk Management (DRM) Programme [2002-2007] in 169 multi-hazard prone districts in 17 states, selected on the basis of the Vulnerability Atlas prepared by the Building Materials Promotion and Technology Council (BMPTC). The overall aim of the DRM programme is supporting national and state governments for sustainable disaster risk reduction in order to minimize losses resulting from disaster and protect developmental gains. The emphasis is on strengthening the capacities of the communities, local authorities and the state and the district administrations in various facets of disaster risk management.

In the State of Gujarat, UNDP is supporting the Gujarat State Disaster Management Authority (GSDMA), which is the State Nodal Agency in implementing the Disaster Risk Management Programme, since November 2002. The DRM programme is being implemented in 11,342 villages of 142 talukas (blocks) in 14 districts of Gujarat viz., Amreli, Patan, Banaskantha, Porbandar, Bharuch, Rajkot, Bhavnagar, Surat, Jamnagar, Surendranagar, Junagadh, Vadodara, Kachchh and Valsad.

An Urban Earthquake Vulnerability Reduction Project (UEVRP), a sub-component of DRM programme, is addressing the earthquake vulnerability reduction needs in 7 cities in Gujarat, those with population exceeding half a million. This project too is being implemented by GSDMA with the technical support from UNDP.

The DRM programme is engaging all key stakeholders in an inclusive and comprehensive action plan, integrated vertically and horizontally, where different sections of society come together to better prepare the State on a broad spectrum so that hazards and vulnerability do not translate into disasters.

The programme involves multiple partnerships of local

communities, government institutions and line departments (at district, taluka/block and village levels), the traditional and modern media, non-governmental organizations (NGOs), community based organizations (CBOs), United Nations (UN) agencies, educational institutions and the corporate sector. These stakeholders are mostly encouraged to take ownership and are supported to integrate aspects of DRM into their own programmes.

In partnership with GSDMA and various other institutions, UNDP has focused its activities on awareness generation, training and capacity building of various stakeholders including administrators and planners within the government machinery with a view to ensure incorporation of disaster risk management and mitigation measures in state development plans, land use planning, project design and appraisal in hazard prone areas.

The Disaster Risk Management programme in Gujarat has achieved milestone developments towards institutionalization and sustainability, through proactive efforts of GSDMA and the UNDP team. The latest among these, is that in the current financial year 2007-08, the Government of Gujarat has made a first-time budgetary allocation of Rs. 10 Lakh INR in the State budget for DRM programme. Also 10 crore INR has been allocated as Disaster Mitigation Fund. The CEO, GSDMA is certain that this represents an important step forward, towards long-term sustainability of the programme in the State.

The DRM programme is building the capacity of the Disaster Management Teams (DMTs) at multiple levels



First Aid Training in Progress

in specialized functions like first-aid, search and rescue, shelter management, evacuation, early warning dissemination etc., which help the community before, during and post disaster. The multiple levels where this is implemented are the gram panchayat or village self-government institutions; at taluka or block level administration which is the direct and crucial administrative link for village development; and at municipal or urban local bodies level.

The programme is also helping in development of multi-hazard preparedness and response plans, known as disaster management plans, at various levels of public administration (state, district, taluka/block, village and city/municipal corporation), based on risk management and vulnerability analysis. As of July, 2007, Village Disaster Management Plans (VDMPs) have been completed in 6113 of the 11342 villages covered under the DRM Programme in Gujarat.

DRM Programme has also developed training manuals for contingency plans on various hazards, in both Gujarati and English, after conducting thorough needs assessment and field-testing. The Standard Operating Procedures (SOPs) have also been put in place for different officials addressing scenarios before, during and after disasters. These guidelines will go a long way in institutionalizing the disaster risk management.

In Gujarat resource inventory database, strengthening emergency operation centres are other areas of focus of the DRM programme. Likewise, bringing in an equitable component of gender is a challenge under the programme. With focused and intensive efforts now underway, it is expected to gain ground in mainstreaming gender in disaster management.

Yet another contribution towards the sustainability of GoI-UNDP's DRM programme, has been the strengthening of the communication system. The initiative to provide a wide range of equipments to the state and district Emergency Operation Centres (EOCs) was taken by UNDP; which has today resulted in an efficient disaster management information system, with a well-established warning dissemination system. The recurrent argument forwarded at most government levels was that the technical support forthcoming from UNVs would be not replaceable in the short to middle term. What also was indirectly conveyed was that Mamaltdars have too many official responsibilities to devote full time, the support from UNDP personnel has definitely supplemented the efforts of Mamaltdars in initiation of DRM activities.



Flood in South and Central, Rural Areas, Gujarat, 2006

EMERGENCY RESPONSE SYSTEM DURING GUJARAT FLOODS 2006

2.1 THE FLOOD SCENARIO IN SURAT

Surat district saw one of the worst floods in all of Gujarat in 2006. Surat is located in south Gujarat and Surat city has a most vibrant economy with zero percent unemployment, owing mainly to the textile and diamond industries. It has a population of 2.87 million with a high population density of 21,673 persons per sq km in the old city limits (Census 2001). The city limits were extended to 326 sq. km. and the population density averaged out to 8,812 persons per sq km in the old plus new city areas. While the decadal growth (1991-2001) in the old city areas has been 62.30 percent, it is galloping at 76.02 percent in the new city areas. The city also has 312 slum pockets.⁴

The city is located by the river Tapi and has a 6 kilometres coastline along the Arabian Sea. It has been prone to floods since centuries and has witnessed major floods of varying intensities in 1782, 1835, 1968, 1994, 1998, 2002, 2004, 2005 and the flood in 2006. The months of July to September are high-risk periods when rivers and drains swell due to rains in upstream regions. The average annual rainfall (1995-2004) in Surat city is 1255 mm (Source SER, Government of Gujarat 2005-06). The Dangs district has a high average annual rainfall of 2545 mm and the downstream flow usually exacerbates Surat's vulnerability to floods.

In Surat city, the 2006 flood was unprecedented in the magnitude and spread of its impact. Nearly 90 percent of the entire city was inundated. Of the seven municipal zones, six had flood water standing around for at least 3 days. Water logging was one of the main reasons for the severity of damage. Low-lying city outskirts with shops, establishments and shelters built on the flood plain along with either banks of the Tapi were inundated with up to 18 feet of flood waters for several days.



Response During Flood in 2006

The severity was partly due to a combination of unusual natural occurrences. It rained continuously for three days in catchment areas of river Tapi in neighbouring Maharashtra State, forcing the dam authorities in Maharashtra to release not just 125,000 (1.25 lakh) cusecs of water as originally announced but a total of 800,000 (8 lakh) cusecs of water over a 3-day period.

The third day of flooding was a full moon night, the sea was on high tide, and the water could not drain out into the sea. The water at the highest point rose up to 20 feet inside the city. The flood protection wall too collapsed leaving nothing between the fury of the waters and human habitations in those areas. Main administrative areas, which had seen highest flood water levels of 7 feet during earlier floods, did not anticipate that water would rise up to 10-12 feet and some offices, including that of the District Collector, had to be shifted twice.

The other major reason for the destruction was water-logging, which it is believed, was aggravated by illegal buildings having come up, many of them in the last four years on the natural draining waterways. The administration was unable to gauge the severity of the disaster because it was apparently not able to assess the extent of water-logging. Its assessment was based on the last severe floods of 2002.

On the second day power petered out and with it, the major communication channel - the mobile phones were jammed or became non-functional with no way to recharge batteries. Wireless systems went on a blink and power generators, normally stationed in the basement of buildings lay under water. The city had run out of supplied drinking water and sanitation was a nightmare.

With this scenario in a city with an extremely high population density, human casualty was limited to 60. Of this number, 32 of them from a single building, the Rabbia Apartments that tilted without actually collapsing.

2.2 EARLY WARNING MECHANISM IN FLOOD AFFECTED DISTRICTS

Gandhvi village is a sitting duck for cyclones. Rubbing shoulders with the mighty Arabian Sea, this tiny village in Kalyanpur block of Jamnagar district, Gujarat with just one thousand population is on a coastline, scoring very high on the cyclone and storm surge vulnerability ranking.

Owing to intense cumulative rainfall received from South-West Monsoon in 2006 many parts of Central (Gujarat & Maharashtra), Eastern and Peninsular India was overcast with widespread excess precipitation resulting in flooding. It was forecasted on 21st September 2006, Gujarat's west coastal areas would be affected. Kalyanpur's Mamlatdar (Block Revenue Officer/ Tehsildar, senior-most administrator at the block level) V. B. Thakker had already conveyed the warning over telephone to the Gandvi's Sarpanch (elected head of the village local self-government / Panchayat Raj Institution), Gulabgiri Murgiri. Sarpanch Murgiri upon receiving the information immediately called a meeting of the 21 members Village Disaster Management Committee (VDMC).

The Village Disaster Management Teams (VDMTs) of three members each, were well prepared to meet any challenge, actually better prepared and equipped, because just four days earlier a mock drill for evacuation to safe shelters had been conducted by the Mamlatdar's office with the help from the UNDP Project Support Officer (PSO).

The specified responsibility of each of the seven Disaster Management Teams (DMTs) in Gandvi as in other villages is 1. Early warning and communication; 2. Search and rescue; 3. First aid; 4. Evacuation and temporary shelter; 5. Relief and co-ordination; 6. Water and sanitation; and 7. Damage assessment.

Besides these teams, the village has also formed an Emergency Cluster Group, consisting of the Taluka Development Officer (TDO, known as Block Development Officer in other States), the Social Welfare Officer, Deputy Engineer from a Government department and a health worker and others who have the expertise in areas of action necessary during or post disaster.

A group of 25 village level responders or volunteers consisting mainly of swimmers for flood search and rescue and trained first aid volunteers were summoned to the community hall, where the emergency meeting was being held. The mobile telephone numbers of most of these responders are recorded in the Village Disaster Management Plan (VDMP) hence contacting them is timely and efficient.

While the gathering high winds fortunately did not turn cyclonic, rains continued unabated. Low-lying Jam Raval village, Gandhvi's neighbour with a large population of nearly 15,000 was inundated when it poured 17 inches of rain on a single day in September, 2006. To make matters worse just two kilometers away is the confluence of three minor rivers. Even during a normal monsoon, inhabitants of the low-lying area wade through a foot or two of water on the approach roads.

The Talati (the secretary of the gram panchayat/office bearer and government representative at the village local self-government) of Jam Raval too received flood warning from Mamlatdar Thakker. He lost no time in bringing together 15 village leaders, who were members of the Village Disaster Management Committee, Panchayati Raj Institutions (PRIs are the grassroots local self-government institutions) members and Village Disaster Management Teams. Within an hour, they evacuated 150 persons from low-lying areas, mostly from the fishermen community and relocated them in the school building and the community hall, the two designated safe points in the Village Disaster Management Plan. While the food grains for evacuees were supplied through the school by the village Panchayat, the women from un-affected families residing on higher ground, cooked the meals.

Mamlatdar of Amod block in Bharuch district received warning of heavy rainfall 72 hours before flooding actually began. Overall, the block saw 941 mm of rainfall during 2006 monsoons. On a single day, it received more than 200mm of rainfall. During emergencies land line telephones and mobile phones are the major modes of communication from the block down to the village level. The Talati and DRM volunteers also use private cable television networks to disseminate disaster warnings. Service providers of mobile telephone and private cable networks are members of the Taluka Relief Committee (Block Relief Committee), which underscores their importance in disaster management.

Best Practice

Cell phone turns Messenger Boy

In Surat city, flood warning was sent by en mass Short Message Service (SMS) to six lakh mobile phone users through respective telecom companies with the calculated expectation that these six lakh users would spread the message by word of mouth. FM Radio too was roped in for warning dissemination. The cable television channels began scrolling the flood warning all through the night, urging people to move to safer places that were at least 20 feet above street level. Next day early morning, flood-warning sirens were sounded from 36 stations.

Mr. Pradipsinh Jhala, Deputy Municipal Commissioner, Surat Municipal Corporation, believes that, *"had early warning not been communicated so widely and through so many mediums, given the city's high population density there is no doubt that human casualties would have been much more."*

Drawing on observations in other village communities in various districts that were visited, early disaster warning dissemination and evacuation coordination by the administration and the community seem to be working well. There has been established a clear line of command and method for warning dissemination at the state and district, down to the village level. This is one of the measurable indicators of successful implementation of the DRM programme and a major step towards its sustainability.

While the warning system is efficient, evacuation is not functioning as smoothly. While in places people had to be persuaded to leave, others wanted to wait and watch till the last minute, before abandoning their homes and cattle. In Jam Raval, communities dependent on coastal resources for their livelihood occupy large tracts on shorelines, exposing them to highest risk. Attempts at rehabilitation have met with limited success.

During safe evacuation too, volunteers complain that these fishermen were reluctant to leave their boats and homes. They often cite their expertise in reading the sea and claim they know when to evacuate. This may be viewed as expected human behavior but does call for targeted sensitization and orientation efforts. In 2000-2001, the Gujarat Maritime Board distributed 1500 free radios and wireless sets to the registered fishermen. Subsequently, government subsidy is being offered to others who buy such sets. The Board maintains a one-way warning system on these wireless sets. In normal times, the transmission consists of news and entertainment; during emergencies disaster warnings are effectively communicated.

In most places, evacuees did not think it necessary to carry essentials like dry food, candles or torches, drinking water etc. with them while moving to the safe shelters. Culturally, the Gujarati community has a deeply ingrained mindset of lending a helping hand during trying times. As such, it is not difficult to understand why people evacuate empty-handed, being certain of getting help. It would however, be far more advisable for each individual to be prepared on his/her own and not depend on external assistance.

On August 5, 2006, Surat Municipal Corporation (SMC) got information from the Ukai dam authorities, that they would release 125,000 (1.25 lakh) cusecs of water over the next few days. The other rivers Purna and Mindhola were already overflowing their embankments. Experience had taught the administration that once water from the dam is released, it would get very little time to act. Next day, a Sunday, the Municipal Commissioner called an emergency meeting with the line department heads. Clearly defined responsibility according to the Standard Operating Procedures (SOPs), for each of the

seven municipality zones were given to the officers of Deputy Collector rank.

Early warning communication functioned fairly effectively, in all the affected areas in Surat district including the remote tribal dominated village like Mandvi. Eight hours prior to the waters from Kakrapar dam reached various scattered hamlets in Mandvi, Home Guards trained in swimming and search and rescue were sent by the administration from the neighbouring Junakrapar police outpost, to evacuate people from vulnerable areas. Some tribal families not wanting to leave their cattle behind, had to be persuaded to evacuate to identified safe shelters.

Case Study

A Delivery in the Boat

Anitaben's baby could not have timed it worse. Surat city was reeling under 20 feet of flood waters. The Chief Fire Officer, Mr. G.M Kothwala got an SOS that a woman was in acute labour pain. The rescue team transported Anitaben on a boat to Prannath Hospital. With two floors underwater, the hospital was operational only on the third floor. The doctor descended with the help of the 16mm nylon rescue rope, after fastening a life jacket, which are part of the emergency rescue kit that contributed greatly to saving many lives in Surat city and remote flood hit areas in 2006 in Gujarat. He delivered the infant (whether a girl or a boy, official rescue records do not mention), hale and hearty, in the boat itself.

2.3 EMERGENCY RESPONSE FROM ADMINISTRATION

The nearby schools had been converted into rescue centers with sanitation, security and food arrangements. The SMC had activated the flood-warning siren from all 36 centres. It had deployed 20 of its powerboats to evacuate people from low-lying slums. Yet many of the community preferred to wait



Practical Demonstration of Search and Rescue Training

and watch to see the waters turned risky enough, before taking evacuation measures. In fact maximum inundation of 20 ft, were seen in the subsequent days in some slum colonies situated beside the river-drains. The same problem was faced trying to evacuate people residing in one or two storeyed buildings. Their thinking was that they could always move on up. But these people had to be rescued from rooftops. Though the reluctance not to abandon home is sought to be explained away as basic human tendency, not heeding strong warnings from the administration, instead making one's own lay calculations based on previous experiences of flood actually necessitates more targeted awareness generation and information dissemination campaigns.

Unfortunately, a similar attitude was also observed among sections of the administration itself. The Telephone department's power generators are in the basement of their building. These power generators were never shifted to higher floors even after heavy flood warnings had been received. This was one major reason for not just telephones but even the wireless communication system going on a blink on the second day of the flood itself, as their power generators went underwater, as per the information given by the Chief Fire Officer.

2.4 COMMUNITY PREPAREDNESS

Amboli, Balak, Rampura, Kholvad, Kholewar, Laskana and Kamrej villages in Kamrej block are situated right beside the Tapi River in Surat district and had to bear the brunt of the floods.

Case Study

Health of Utmost Importance

Naina Jayeshbhai is an Anganwadi Worker (AWW) in Laskana village. When information was received that the dam gates would have to be opened, the VDMC members relayed the warning through the VDMTs, urging families in the low lying areas to move into identified safe shelters. Naina, herself being a member of the VDMC and a trained first-aid DMT member gathered the women of her area, Halpati and held an emergency meeting at the village community hall. The women, most of them agricultural labourers fetched their younger children, some utensils and clothes and returned to the community hall, which was the identified safe shelter. They stayed there for four days and were fed by the women who were in safer areas.

After the waters receded partially, AWW Naina went from house-to-house distributing chlorine tablets and instructing the community about its use for

making water safe for drinking. Health has been high on the post flood agenda of all communities in Gujarat during the 2006 floods. Although the 105 heads of cattle dead in Laskana village were promptly and efficiently buried 15 feet under the ground by the DM Task Force and chemicals were sprayed for their quicker decomposition so that ground water would not get contaminated leading to epidemics, still the administration was taking no chances. Safe drinking water was of utmost importance.

All 70 villages in Kamrej block had prepared and updated their VDMPs, which contain contact numbers of trained Central Reserve Police Force (CRPF) personnel, home guards and volunteers for search and rescue. Since each village had been given just five emergency rescue kits, many like Pitamber Paswan of the CRPF had already kept in readiness traditional rescue equipments. Using common sense and traditional techniques he had prepared a lifebuoy of dried green coconut shells stuffed in a plastic cement sack. Necessity being the mother of invention, he had collected empty plastic mineral water bottles; stringing five to six of these around the waist, he could navigate the strong currents and reach the marooned people.

It was not just rescue that needed swimmers and rescue teams. In Abrama and Balak villages, food packets, water pouches and medicines had to be supplied by boats. Fourteen rescuers from neighbouring villages were readily identified from the Taluka Disaster Management Plan (TDMP) and sent to undertake the task and distributing relief material to the marooned community.

The DRM programme was initiated in Padra block in Vadodara district in November 2005. The preparedness of the community and the training of its VDMTs were put to test during the floods of 2006, when all its 83 villages were officially declared flood-affected.

Padra's geography renders it highly vulnerable to floods during heavy rains-the Dhadhar and Vishwamitri rivers flow on its south and south-west sides, while major Mahi river flows through 12 of its northern villages. With more than 2000 mm rainfall in 2006, which is four times the normal, four villages in Padra block, namely Husepur, Medhad, Kothwada and Virpur were cut off from the rest of the district for 3 to 13 days. With the Padra and Karjan (Taluka) supply roads submerged, food packets and water pouches had to be air dropped.

DMT members of search and rescue, first aid and relief and coordination however efficiently handled the

disaster and its aftermath. Thakorbbhai Vasava of Husepur village rescued 250 people and on one occasion had to fight off a crocodile, Dhadhar and Vishwamitri (and Narmada) rivers are the habitats of these reptiles. Rafikbbhai Malek of Kothawada rescued 50 people using a coir rope and a wooden plank. Hasambhai Malek of Kothwada has been rescuing people during floods for the last 20 years, but he says, "after the DRM programme, people's awareness has gone up and that makes my job easier than before".

All the Primary Health Centres (PHCs) in Laskana village, which has a population of around 12,000, were submerged and all medicines rendered unusable. Vasantiben Kanlilall Parmer, an AWW and member of the First aid DMT of the Vrundabannagar area that remained unaffected, situated on higher ground, was attached to the Mobile Health Unit that tended to the community for a month.

Some chikungunya, malaria and diarrhoea cases were seen. Vasantiben distributed ORS packets and paracetamol tablets to the community members. She also distributed mosquito nets from World Health Organisation through the Integrated Child

Development Services (ICDS) programme to the pregnant women. The field health personnel knew that with high presence of cattle, vector borne diseases are to be watched out for.

Mamlatdar of Kamrej, BM Patel observes that the DRM programme has succeeded in raising awareness levels and has improved preparedness for disasters and their aftermath. He would know the difference because he has been holding the post for the last three years and has witnessed the community transformation. The VDMCs here mostly consist of younger people, while the old and experienced provide advice, ensuring involvement of a cross-section of the villagers at various levels.

However, Mamlatdar BM Patel's work was seriously hampered by an acute shortage of boats and emergency rescue kits. Only one boat from the Nausar police station with a carrying capacity of 5 persons was deployed. Private boats which carry sand deposited on dry river bed during normal times (with carrying capacity of 6) were commissioned but these were just not enough.

Issues & Concerns: *From these four villages alone, 1705 people had to be evacuated to safer school buildings on 29th and 30th August 2006. It is to be noted that each of these villages has an approximate average population of 1200. In Virpur merely 200 people were shifted before the floods to the safe shelters. In all these four villages less than 50 percent population was evacuated. That, an equal number stayed back but had to be at a later stage rescued, suggests more sensitization is needed amongst the community to understand the immensity of the risk they are in, by not relocating to temporary shelters where satisfactory arrangements are made for food and water. Of course, the low number of evacuees has to factor in the possibility that some may be having safer houses like double storeyed / pucca buildings / houses on higher ground. House, cattle and human life insurance could change this attitude.*

The other concern is that in Padra, women from the lower economic class said that they had carried nothing with them when they shifted to the safe shelter, not even the mandatory torch, clothes, some dry food, dry fuel if available, candles or kerosene. One explanation for this could be that in Gujarat, more often than not relief is forthcoming from some quarter; but relief dependency as one can view this is a risky behavior. Kothwada for example remained cut-off for 13 days. This kind of dependency puts more pressure on the administration and the members of the community who volunteer aid. In other districts too, women mostly did not carry all the mandatory essentials.

Strengths- *The administration's efforts at providing*

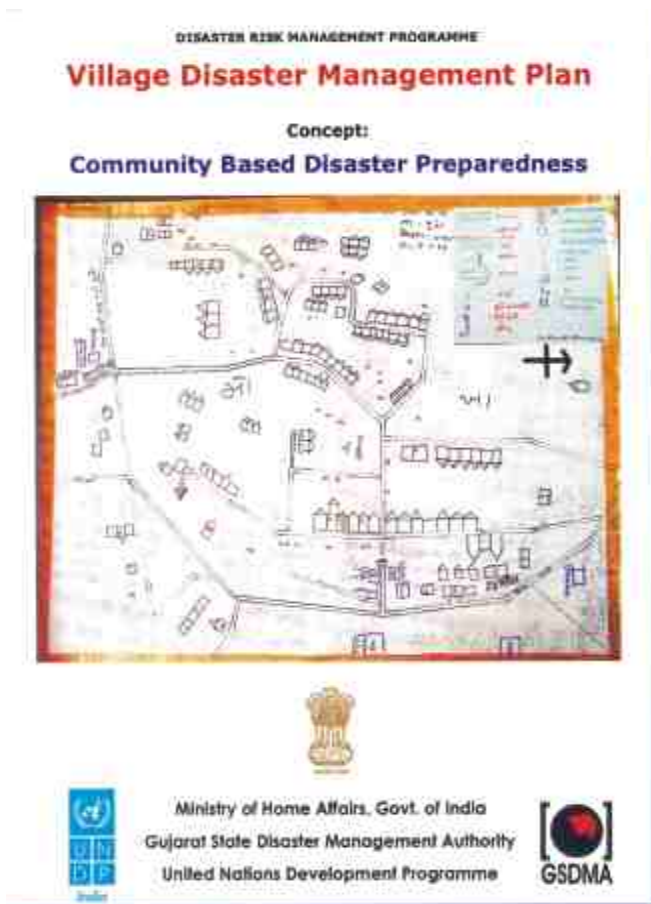
Best Practice

Post disaster: Community embarks on self-appraisal

The DRM programme had been completed in Bhathana Kosad village in Choryasi block of Surat district. The UNDP UNV Ms. Nilam Jani had moved on to work in the Mahuva taluka when she received an invitation to attend a meeting by the ex-Lady Sarpanch Subhadraaben of Bathana Kosad. The meeting was an unusual one. The Village Disaster Management Committee (VDMC) had convened it in order to conduct a disaster social audit - to review and evaluate the quality of services rendered by the various Village Disaster Management Teams (VDMT) during the just receded floods.

It was announced that those members of VDMTs who had not measured up to the expectations, would be replaced. The VDMC and the VDMTs sat together and discussed in detail the village assets that had proved useful and whether the external relief material was well utilized and fairly distributed. They also scanned and analyzed the role and responsibility of each VDMT.

Such self-appraisals post disaster not only demonstrate community ownership of disaster management but is also a practice worth replicating in other villages.



Village Disaster Management Plan

relief were almost everywhere supplemented by volunteering members of the community who had remained unaffected or relatively less affected.

As of July, 2007, out of the 11,342 villages under the DRM programme in 142 talukas of 14 districts, VDMPs for 6113 villages are completed. Prior to the floods in 2006, all the updated information in the SDRN and IDRN had been integrated into the Taluka and Village Disaster Management Plans, under various chapters. The Administration and the Taluka EOC had a copy of the TDMP with its inventory for ready reference. The chapters on the hazard profile and hazard maps of the taluka provided valuable village specific information while shifting the vulnerable people living in the low lying areas.

Chapters such as public and private doctors and annexures on contact details and location of DMTs, trained personnel at the Taluka and District level with their contact numbers, list of safe shelters, availability of rescue boats, heavy equipments, details on swimmers and fishermen, NCC, Home guards, Anganwadi workers, location of health infrastructure were very useful to the Taluka Administration, as stated by several taluka level officials. As mentioned earlier, the Surat Municipal Corporation (SMC) used the CDMP to locate safe shelters in each ward.

Best Practice

Prepared for the rains

Arena Khodada village in Junagadh is in a low-lying area. A particularly heavy rainfall can cut off the entire road to the village. All the fair price shops in that area take their stocks of essential items between May 15th to June 10th at one time, for the ensuing four months of monsoons, so that if communication is affected, the poor do not have to go without essential rations. Normally stocks are lifted on a monthly basis.

2.5 USE OF TRADITIONAL KNOWLEDGE

The *Tarapa* is a makeshift raft / pontoon. All it requires is, 4 plastic jerry cans of 15 to 20 litres capacity, 10 to 15 pieces of bamboo slits and some coir ropes, all of which are easily available. The jerry cans are closed with their caps and made airtight to ensure that they keep floating. The bamboo slits are lined up on the cans and secured with the ropes. Similarly, mineral water bottles are secured together around the waist of a person to keep him/her afloat. In Kachchh district, which had high incidents of fire disasters in summer, low mud walls which separate houses from each other act as a fire retardants.



Use of Locally Available Materials for Making Tarapa



Suggestion: Except a few ingenious hand-made contraptions, traditional preventive and coping mechanisms are not seen in use, which is an area of concern. Such mechanisms are age-old, local specific, acceptable to and its operation understood by the community and often cost-effective. They need to be documented and kept alive.

2.6 VOLUNTEERISM DURING THE FLOODS OF 2006

Gujjuchaps Global E-Community⁵ illustrates in essence the Gujarati attitude towards community service. Gujjuchaps is perhaps the first non-profit organization set up in Bangalore three years ago by a group of Gujarati IT professionals, now with 13,000 members, to provide service and support to members of their community who want to work in the IT sector. Right from accommodating strugglers to training them for interviews, holding workshops in their home state for motivation and guidance, Gujjuchaps is doing it all for free. Thousands of their members have settled in various parts of India as well as in the United States and other countries.

The Gujarati volunteerism is an inherent and pervasive part of their social make-up and is an important factor contributing to disaster management, albeit mostly contributing to the post disaster relief activities.

Communities and the administration unanimously describe as invaluable the role of the National United Nations Volunteers (NUNVs) as dedicated disaster coordinators and facilitators. Besides technical expertise, their positive equation with administrators, village disaster management personnel and volunteers alike, provides a crucial link to the successful implementation of the DRM programme at all levels.

NUNVs role during the floods 2006

Pre-disaster Planning: At the district level, NUNVs facilitated and discussed the Standard Operating Procedures (SOPs) with the line departments. At the taluka level preparedness meetings with the liaison officers were initiated, with emphasis given on SOPs of the line department staff and their departmental contingency plans. All the emergency contact numbers of various agencies were cross checked. Taluka level Emergency Operation Centres (EOCs) and department control rooms started working round the clock. All NUNVs started working in close coordination with the administration. Looking at the hazard profile and vulnerability of the area, specific mock drills were conducted at different levels.

Coordination: All the department control rooms were contacted and requested to maintain constant

Case Study

A life of indefatigable service to society

Pramila G. Dave at eighty-one is indefatigable, leading her band of women volunteers under Stree Niketan, a voluntary organization in Jamnagar, to offer help and relief in disaster hit areas, in and outside Gujarat. As the news of the severity of the floods in Surat in 2006 came in, Pramila called all the organization members and began preparing dry snacks - realizing that the first need in a flood affected area would be some food items. The young boys of the locality packed them neatly, in poly-packs and the packets were sent to the administration to be distributed in the affected areas in Surat. The Tsunami affected areas in Tamil Nadu too, had received hand-made food items and clothes from Stree Niketan, whose members mostly come from an educated middle-class background.



Pramila Dave, a Woman Volunteer

Pramila Dave, as President of Stree Niketan, publishes a monthly newsletter containing information about do's and don'ts about various disasters. The newsletter has already published a series, detailing the measures to be taken for mitigating the four major disasters. She had also organized trainings on search and rescue for the organization's members under the DRM programme in Jamnagar.

It's worth noting that, Stree Niketan generates its own funds through membership fees and an annual 'Garba' dance function during the Navratri festival. From the funds collected, the organization also offers an annual scholarship of 5,000 INR to ten destitute students.

Armed with a degree in social work from Tata Institute of Social Sciences, Mumbai, at a time when women generally did not even get basic school education, Pramila began her professional career with juvenile delinquents and set-up a Mahila

Mandal in Jamnagar in 1962 to teach sewing to destitute women. Subsequently, she set up Stree Niketan. For Pramila, volunteerism is a way of life. Her strong feelings and empathy for suffering fellow beings, is deep rooted in her family. *"My life is given to serving others"*; she says. And clearly she is a driving force and inspiration for women to selflessly serve others.

Case Study

Community Volunteerism: those who put their lives at stake for others

Yogendrasinh Panjrolia is a primary school teacher and a home guard with the State Police. At heart, he is a volunteer, a man who lives by what his father told him once when he was a boy:

"Son, all live for themselves. But he that lives for others is the true human being."

One of the five home guards selected for swimming and search and rescue training in 2005, a thirty-five year old Panjrolia in a daring but well organized rescue operation, saved a marooned group of 26 people in Jambusar city during floods in 2006. In this four families marooned in Chikuwadi village, 1.5 km from Jambusar, 14 were children, the youngest of whom was just 7 days old.

When Panjrolia was directed by the Mamlatdar of Jambusar to undertake the rescue, the river was in full fury. Sweeping currents swirled 15 to 20 feet over Chikuwadi's farmlands. His team of seven, wearing the freshly distributed life jackets, carrying the life buoys and nylon ropes provided in the rescue kits, had to swim to the thatched huts which were half underwater. The area was full of the thorny babool shrub rising under the water, cutting into their feet. Navigating and beating down the biting branches was made more difficult, as the water currents made their own movement precarious. Half



way, Panjrolia spied a stout mango and a neem tree some 70 feet away from the huts.

He tied the nylon rope to the mango tree and asking his men to hold it there, while he took the other end and swam to the neem tree and secured it. His team, holding the strong rope now reached the cluster of huts. With them, they had carried an uprooted wooden door being swept away, knowing it could be used as a raft. On the bottom side of this door, they now tied three life buoys in a row, on the four corners four adults were seated to keep the balance and in the center they seated all the children. The children used the secured rope to navigate their way to safety.

The rescue team next tied their life jackets on the seven women and asked them to use the rope and paddle ahead. Now only the 7-day-old infant and her father were left. But when the mother of the infant girl, halfway started screaming that she wanted to return to her baby, Panjrolia had to be very stern with her; returning would have meant that the moving file would have to be broken and panic and confusion would have set in.

In the rough waters, without their life jacket, Panjrolia began thinking of all possible ways to carry the infant to safety. Finally, he hit upon an idea. On one life ring he tied two pieces of bamboo, which he pulled out from the thatched roof. On this he placed another life ring and on that the only piece of clothing that was not dripping wet. On this he placed the baby. But just as he set out to navigate, huge raindrops started falling. If the baby kicked and moved, the rescue could turn tragic. Panjrolia took the baby inside and covering the infant with a thin cloth. He set out again, holding the life ring with one hand and the rope with the other.

But movement was impossible; such was the force of the rushing waters. Finally he straddled the rope and using his legs and hand in measured movements reached the mother who by the time was hysterical with fear and panic. Panjrolia's tension was no less than the mother's. He remembers, *"In those cold waters, I could feel the sweat pouring down my body"*.

communication with the Taluka level EOC. Departments such as Gujarat Electricity Board, Roads and Buildings, Health and Family Welfare, Forest, Gujarat Water Supply and Sewerage Board (GWSSB) and Water Resources, were asked to keep their equipments and personnel on high alert following the warning of heavy rainfall as received from the District EOC. NUNVs gathered information about

developments at taluka level and shared it with the district level officials.

Response: After warnings of heavy rainfall/cyclones were received, all NUNVs along with the district and taluka administration disseminated warning messages and coordinated with various government departments. District Disaster Management Officers (DDMOs) and Project Support Officers (PSOs) now operated most of the time from the District Control Room, in liaison with the Collector/Additional Collector/Resident Deputy Collector (RDC) and supported the mobilisation of resources listed at the India Disaster Resource Network (IDRN) and the State Disaster Resource Network (SDRN). The information generated from the SDRN proved very useful in coordinating relief activities.

At the Taluka level, PSOs activated the trained DMT members, who were in touch with the DMCs for undertaking rescue and relief work. PSOs have also individually visited the villages with the rescue team, wherever the situation so demanded. In the post flood situation, the programme staff helped the Taluka and city administration in launching health and sanitation drives with the help of National Cadet Corps (NCC), National Service Scheme (NSS) and community volunteers.

2.7 ADVANTAGES OF THE DRM PROGRAMME

The officials admit that swift emergency responses during 2006 floods owe much to the DRM programme. Not only was the administration better prepared (though it was unprepared for the unprecedented magnitude of the disaster) but the co-ordination between the state and district Emergency Operation

Case Study

Safety Kit is the hero of the day

On the second day of the flood in Surat City when the Tapi river currents were raging furiously, Principal Secretary, Urban Development department, Government of Gujarat, Mr. S.R Rao, Mr. Pankaj Joshi, Commissioner, Surat Municipal Corporation, Mr. G. P Mahapatra and Mr. K Srinivasan, Senior Indian Administrative Services (IAS) officers were inspecting the extent of flood damages moving from one bank of the river to the other on a power boat. The boat capsized in the swirling waters of the river. Fortunately, all four senior administrators were wearing the Surat Municipal Corporation's newly acquired life jackets - rescue kits had been supplied to it just six days ago. The life rings were also used and they were safely back in the escort boat within 15 minutes and escaped the fury of the flood waters.



Search and Rescue Training

Centres, Block Information Centers and the convergence of trained search and rescue teams from various parts of the State and the rescue kits with a life jacket, life ring and rope that had been distributed by GSDMA only a week earlier, were of invaluable emergency help. The City Disaster Management Plan (CDMP) was particularly helpful to identify safe shelters in each municipal ward and rescue and relief teams from other places.

Yet another major contribution of DRM programme has been the 2,155 volunteers and administrative personnel selected from Central Reserve Police Force (CRPF) and Home Guards from the State police, who had been trained from all the 25 districts in special flood and fire rescue. The 12-day Special Flood Rescue training is imparted by an NGO- Nauka Talim Kendra on the bank of Narmada river in Sinor. Fire and emergency service centres at Ahmedabad, Surat and Rajkot are providing fire rescue training under the DRM Programme as well as from the World Bank funding. These trained people were deployed for flood rescue in all flood affected areas in 2006.

Emergency Rescue Kits have been a very significant contribution to disaster management in Gujarat under the DRM Programme. In 2004, some 3,440 Life Saving Jackets, 100 Life Buoys and 600 (14mm thickness) plastic rescue ropes worth 1.82 million (18.20 lakhs) INR were procured under the GoI-UNDP DRM programme initiative and funding, for around 80 flood prone blocks of the State. These rescue kits were found to be extremely useful during the floods in 2005. There was a felt need for more of these rescue kits from the district authorities. GSDMA then went ahead to procure 10,000 life saving jackets and 10,000 life buoys at a cost of 25.2 million (252 lakhs) INR from the Calamity Relief Fund component and deployed them in nearly 2000 flood-prone villages across the state. The rescue kits played a stellar role in search and rescue operations during the floods of 2006.

Indeed, there was not a single place where the administration and the rescue volunteers did not

regard these emergency rescue kits as saviours of sorts. Many wanted more numbers for future use. The necessity of demonstrating use of life jackets, life rings and a rope to all community members was also voiced. The case study cited here is a telling testimony to its efficacy.

Best Practice

Post floods: Preventive health measures take precedence

Yet another positive development over the 2005 floods was the total absence of a single case of diarrhoea. Two cholera related deaths occurred in 2005. According to Dr G Khetri, Block Health Officer of Amod and Vagra talukas, in Bharuch district, integrating DRM components like first-aid training and imparting awareness about the connection between floods and spread of epidemics have yielded positive results. *"With the onset of monsoons this year, we emphasized extensive chlorination of drinking water. Our female field staff visits 5-6 villages on a weekly basis and male staff does so every fortnight. Health workers and AWW spread awareness about how important it was to make drinking water safe and how this can be done easily. Adequate chlorine tablets were distributed."* Dr Khetri who covered 125 villages affected by floods in 2006 in Amod and Vagra talukas, says the community had

been made aware that they must report any ailment immediately to the AWW, who would inform the Medical Officer Dr. R. Khanna, which they very conscientiously did. As a result, except for 6-7 serious patients and some skin ailments, Amod block did not see any other serious health fallout of the severe floods.

One of the major thrust areas of the pre-monsoon first aid training in 2006 in flood-vulnerable areas of the State, had been awareness generation about safe drinking water through chlorination. Women and other community members in all villages were made aware of the fact that one tablet can purify 20 litres of water.

The Mamlatdar of Amod makes an interesting observation comparing the administrative scenario of pre and post DRM programme, *"pre-monsoon contingency meetings for anticipated floods are a feature which is many years old. The difference between then and now, is that earlier line department representatives would often make excuses not to attend the meeting; but now even when clouds gather in the sky, they telephone and enquire if there is anything they should be doing."* He adds, *"post-floods, earlier if a bridge required repair, they would respond by saying, yes we will send our labour/mason soon. Now they themselves supervise the repairs works."*



Specialized Flood Rescue Training

The awareness generated from the DRM programme, the institutionalization including the strict implementation of the SOPs and lastly the mandatory presence of every government official at his or her post during disasters enforced through the DM Act, are factors at play in bringing about this sea change. Earlier posted in Amroli, another flood-prone block, he observes, *"just some years ago the administration initiated action only when faced with the floods, now we begin preparing before monsoons."*

While disasters remain a learning opportunity and test of previous learnings, the DRM programme is seen to have brought about some systemic changes in the Surat Municipality Corporation, one of the strongest and richest Urban Local Bodies (ULBs) in Gujarat. To counter its flood proneness, SMC already had a DM plan since 1998 but the pre-monsoon exercise involved only officers and employees of SMC and confined itself to the preparation for handling the sanitation, cleaning-up the drainage system and preventing epidemics. After the DRM programme was introduced every

municipality ward has a contingency plan in place. DRM programme has supplemented in capacity building and awareness generation, in particular.

The fight to prevent post-flood epidemics was exemplary in Surat. After the flood waters had receded, the streets had 5 to 6 feet of debris and muck piled up. Mobilized from different parts of Surat, 5000 volunteers came in for the cleaning. After dumping in 3-4 designated areas in each of the 7 municipal zones, the Fire Services used the hose pipes of their 13-14 fire tenders to continuously spray insecticide on the garbage for 5 days. By the tenth day, Surat city had been cleaned up and life returned to near normalcy.

While any major epidemic was averted in the post flood months, the city did witness a disease scare with the outbreak of diseases like *chikungunya* as well as *leptospirosis*, which were hitherto concentrated more in the rural areas. The community received timely medical help especially related to preventive aspects of health from the government.



The Women and Men of Gujarat.... Gain Better Skills for Being Prepared

GENDER PARTICIPATION IN DISASTER PREPAREDNESS

Given India's cultural and social practices, the degree of women's participation varies across the states. For achieving the objectives of sustainable disaster risk reduction under the Gol-UNDP joint programme in the selected 17 states, the programme emphasizes capacity building of community at all levels with equal participation of women through gender sensitive approach in institutionalizing the disaster risk management system in India.

The gender equity, one of DRM programme outcomes, emphasizes that woman's participation should form 33 percent of the DMCs and DMTs formed at all administrative levels of the programme states. Gujarat has a powerful Panchayati Raj System (grass root local self-government) in place since 1963 with 33 percent reservation of women, much before the 73rd constitutional amendment which nation sought to take the reservation route to empower women at the grassroots. While constituting a VDMC of 21 members (usually a norm to be followed) chosen by the



Anganwadi Workers Attending First Aid Training

community leaders, there are 2 to 4 woman members which account for 10-20 percent of women's participation.

In Gujarat, on further analysis of the aspect of gender equity reflected in VDMC's, it emerges that woman members who are chosen to be apart of DMCs are



Mapping Exercise at the Village Level

mainly represented by Anganwadi workers, school teachers and Sarpanches. Among the three selected representatives, one of the members should be a woman. Also reviewing among 7 different formed VDMTs, the extent of women's participation was represented as a part of health care, first aid and trauma counseling teams. In case of VDMTs of search and rescue, evacuation and early warning, women's participation is less due to the stereotype notion of gender roles that restricts women from equally participating in all DMT activities. During emergencies, community kitchens are often operated at relief camps and temporary shelters, where women volunteers manage these kitchens. In tribal dominated areas of Mandvi, which is one of the 12 integrated Tribal development project areas in the state, through the formulated network of Mahila Juth (Self Help Group) and Mandli (Cooperatives), has women participation of 25 to 30 percentage.

Though photographs do depict women presence during mapping exercises, women's participation is relatively differential across the state. Women's participation is lower in Saurashtra region, particularly in some villages in Patan and Kachchh districts. In this region, culture and social set-up plays a major role in influencing the extent of women's participation. The Panchayati Raj Institutions (PRIs) and Community Based Organizations (CBOs) are potential platforms for generating awareness on gender equity related to DRM in Gujarat.

The CEO GSDMA Mr. Rajesh Kishore admits that gender inclusiveness is a challenge under the programme, but extensive gender sensitization efforts are now underway at various levels.



Display of IEC Materials and Important Contact Numbers at the EOC

MANAGING DISASTERS

4.1. STATE DISASTER RESOURCE NETWORK (SDRN)

A web enabled resource inventory used for mobilization of resources and volunteers for emergency, is envisaged in the DRM Programme's project document. Gujarat has built up commendable strength in this area. In May 2003, when the DRM programme got on-track the DRM team and the GSDMA realised, given the State's recurrent and multi-hazard profile and existing communication backbone, that a comprehensive database of disaster management related inventory was very essential for an organised response to disasters.

Till that time, it was the lack of proper and adequate information about disasters and not as much the lack of resources including human resources, that had hampered fast, systematic and integrated administrative response. Delays had proved critical to the eventualities. A case in point is Deputy Municipal Commissioner of Surat Municipal Corporation Mr. Pradipsinh Jhala's revelation, that the city's database had been updated recently owing to the bird flu epidemic in the city and this was a major help during the 2006 floods.

This online centralised database and information system named State Disaster Resource Network (SDRN), collects, collates and stores details of critical infrastructure resources. The information is collected through the VDMP format in local language at the village level and collated at the taluka level with the taluka level secondary data to produce the TDMP. These TDMPs are aggregated to form a District Disaster Management Plan (DDMP). The SDRN also produces query-based reports on resources availability (like boats, heavy equipments like fire tenders and earth movers etc), vulnerable areas and populations at risk (low-lying or sea-facing areas or economically vulnerable populations like ST and SC and Other Backward Caste (OBC) families or the differently-abled and aged; settlements with houses of thatched roof, slab roof and mud houses, livelihood activities, emergency contact details (of EOCs, administrative heads, police fire tenders etc) and those of human resource (like trained search and rescue teams, swimmers, medical personnel, etc).

Literacy levels, soil type, land use and crops cultivated, number of livestock are other information available from the VDMPs. The CDMPs and TDMPs too provide contact details of cable TV service providers, so that

they can scroll or announce emergency forecasts and information.

The Disaster Management Plans at the state, city, district, taluka and village levels, require an ongoing flow of essential information, as they are meant to be regularly updated twice in a year, in April for pre-flood season and in September before the cyclone season.

It made sense to capture the data generated for the plans on uniform formats for easy compilation, collation, analysis and accessibility, through the fiber optic based state-wide intranet, known as the Gujarat State Wide Area Network (GSWAN). GSWAN is the State owned and coordinated by the IT department of Government of Gujarat. It is Asia-Pacific's largest IP (Internet Protocol) based e-governance backbone, connecting the State capital to all the 25 District Headquarters and all 225 Taluka Headquarters, to provide voice, video and data services. Currently 2000 government offices of various departments at the district and taluka level are connected by GSWAN.

SDRN is integrated into the Geographic Information System (GIS), Pragati. This GIS based resource mapping has been developed in collaboration with the Gandhinagar based Bhaskaracharya Institute of Space Application and Geostationary. GSWAN is also linked to the State department of Economics and Statistics, from which accuracy of data can be cross-checked. It is also visualized that e-dhara, Government of Gujarat's on-going process to computerise all land records will assist through the SDRN, to locate appropriate land areas for rehabilitation under the IAY (Indira Awas Yojana) and SAY (Sardar Awas Yojana) schemes and DRM related development work.

While the bilingual functionality of SDRN offers decentralized data entry, GSWAN functions as the network backbone and master data source. Full access authorised to it through a password, allows district, taluka level and nodal officers to add, modify and view reports and data of the TDMP and VDMP.

In case of network failure in a particular taluka (owing to power failure during disasters etc), GSWAN provides the password to access (limited to only viewing) through another taluka. During emergencies vital resources available in a neighbouring village may serve as a crucial support. SDRN allows access to database about PHCs, Sub-Centres, public hospitals, the larger secondary schools in neighbouring villages (to be used as safe shelters). SDRN offers a very good medium for networking and knowledge sharing among various stakeholders.

SDRN serves the important purpose of making available at the click of the mouse, the plans at all levels and inventory of resources. Besides being a time saver, the visual reports in the form of maps and charts assist in gap analysis and requisite resources mobilisation.

During the 2006 floods and cyclone warnings, the SDRN was accessed from talukas. From Padra of Vadodara district, Vav of Banaskantha, Mangrol, Mandvi and Kamrej of Surat and from district and taluka control rooms of Jamnagar and Valsad, queries were entered for demographic details, contact of DRM teams, availability of electrical equipments, details of taluka maps, availability of boats and NGO details. In Surat, Additional Collector Mr.G.V. Mewada reported that the CDMPs and TDMPs offered invaluable support in identifying safe shelters in different localities. Chief Fire Officer of the Fire and Emergency Services, Surat Municipal Corporation adds that *"a total of 13,867 people were rescued and in places with waters rushing with strong current at 20 ft height, if we had not been able to identify safe shelters in close proximity we would never have been able to rescue so many"*.

The SDRN has the potential to become one of the strongest tools in the hands of disaster managers. To a good extent it is serving its purpose in Gujarat, but its full potential remains unutilised due to delays in updations. This concern was voiced at many official quarters, notably by the CEO GSDMA himself, *"This is a major problem. Some updation is being done, but many offices need multiple reminders. Using and updating SDRN should become part of the administrative work culture."*

Reason for delay in updation, it is found, ranged from apathy, incomplete comprehension about the technicality of operating the intranet. At Kamrej Taluka Headquarter in Surat district, which had seen severe floods last monsoon, a 40 year old Abdul Aziz a community volunteer registered with the SDRN, also does entries updation.

Strengths - *The online facility of Gujarat is in place. Gujarat is the only State under the DRM programme to go online with an extensive resource inventory database. SDRN is also connected to Geographic Information System (GIS). Has the potential to greatly reduce time in providing rescue and relief. This database is very effective for small scale disasters as it stores all local level resources. Efforts are on to provide connectivity at the village level too.*

Issues & Concerns - *In some talukas, information updation is not regular. At the taluka level, some administrators are comfortable with hard copies; apathy to learn technical skills to operate SDRN.*

4.2 INDIA DISASTER RESOURCE NETWORK (IDRN)

The India Disaster Resource Network (IDRN) launched by the Ministry of Home Affairs, Government of India under the DRM programme, is a web portal for collection and compilation of resource inventory for resource mobilisation in the shortest possible time span. IDRN is being implemented throughout the country and maintained by the National Information Centre (NIC) and can be universally accessed, unlike SDRN which can only be accessed by officials of the Government of Gujarat. IDRN contains data of all the districts of India, while SDRN includes taluka and village level details within the Gujarat State. IDRN and SDRN complement each other depending on the area and magnitude of disasters, but regular updation is a must because disasters come unannounced and outdated data is as good as no data.

4.3 INCIDENT COMMAND SYSTEM

The Incident Command System (ICS) refers to a management system used for incidents of natural disasters such as earthquakes, floods, cyclones, landslides or emergencies caused by train accidents and epidemics. The system provides scope to organize various functions, within the overall response process, while emphasizing greater coordination and communication among different involved organizations. ICS as a system for response is flexible



A Review Meeting

and adaptable to suit any scale of natural as well as human-induced emergencies/ incidents. It can be used for routine emergencies such as road and train accidents and for complex multi-jurisdictional disasters. In fact as a management system, ICS draws its strengths from its applicability to a wide range of incidents/disasters.

The main intention in using ICS is to transform the early stage of an emergency situation into a well-managed



Mr. Rajesh Kishore, CEO GSDMA

response process ensuring quick and effective response. The relevance of ICS can be easily understood if we look at some of the responses during disasters such as Orissa Super Cyclone in 1999, Gujarat Earthquake in 2001, Tsunami in 2004 and Gujarat and Maharashtra floods in 2005 and 2006. The response during these emergencies required involvement of a number of departments. Achieving coordination among these departments during emergencies created unique challenges, such as a line of authority, supervision, resource management, communication etc. The ICS provides a framework which makes use of management concepts such as unified command indicating clear line of authority, organizational flexibility for different scales of emergencies, standard operating procedures for better communication, resource management and systematic guidelines for an effective incident response.

Gujarat in 2005 was one of the pilot states in India, to have adopted the ICS. After, the training and customization of the ICS to the prevalent disaster scenarios and India's administrative set-up, the capabilities are being enhanced through the Disaster Management Support (DMS) Project, a collaborative effort between GOI and USAID. To strengthen the disaster management system at the state level as Mr. Ashwini Kumar, District Collector of Junagadh district, mentions "*Junagadh, Vadodara and Kachchh are the three pilot districts within the state of Gujarat chosen for their vulnerability to cyclones, chemical hazards, floods and earthquakes respectively*". Mr. Ashwini Kumar and his colleague Mr. Rajeev Topno, presently District Collector of Vadodara, are now sharing their experiences from the training received as national level trainers. The team of national trainers would be involved in training officers at the national level and eventually would train state and district level officials involved in response teams. According to Mr. Rajesh Kishore, CEO, GSDMA, "The customization in Gujarat could take another four months with an adaptation workshop, team formation and training in and finally a simulation exercise".

Strength - When put in place, ICS will streamline disaster management to be much more effective.

Best Practice

Emergency Operation Centre (EOC) for Community Service 24x7

Haloo! Hologrammed a booming voice into Rathodbhai's ears. The private television channels had been alerting the public about an impending high velocity cyclone. On hearing the warning, Rathodbhai, a marginal farmer from coastal Bhatvadiya village of Kalyanpur block, called the 24X7 Emergency Operation Centre (EOC) in Jamnagar district headquarters, to find out exactly how alarming the situation was. Since 2005, when the Revenue Commissioner ordered the EOC to be operational round-the-clock, the District Administration had announced that the citizens could get accurate information about probable or ongoing calamities, even accidents, industrial or others, by just dialing 1077, the common emergency number for all district EOCs.

For the citizens of Jamnagar and, even for the administration, this has been a giant pro-active step forward. For, not long back, till 2002, before initiation of UNDP-Gol DRM Programme, there was no EOC, but only a Flood Cell which was set-up for three months during the monsoons. In summer, the same Cell assumed the nomenclature of a Drought Cell and was disbanded when the season was over.

The EOC is aimed to provide an interface between the administrative machinery and the public. The citizens could also feed in information about accidents and mishaps (including fire and road mishaps and even food poisoning cases in remote villages) to the EOC to facilitate prompt action by the authorities.

For a villager, worried about the safety of his/her



Emergency Operation Centre (EOC)



Communication Equipments at the EOC

house, land and family, calling up the EOC to find out about the impending calamity, the booming response from the EOC officers didn't do much to ease his trepidation. Realizing the need to sensitize the EOC personnel on the need to be responsive to queries from people, and to reassure them of the prompt administrative response, Mr. Dhananjay Goswami, the District Disaster Management Officer (DDMO) worked out a one and half hour training module on communication and other general issues related to performing duty at the EOC, with the consent of the District Collector. The training module had to be short, as more than 100 employees each from class III and IV from various departments, were trained in one session. Two sessions in the first week of every month were organized.

The short training module is informal but contains relevant information on do's and don'ts for EOC personnel. It focuses on ways of effective communication, correct attitude and professional behavior. It details the 'first-and-must' four steps of immediate response, passing on the first information of disasters or accidents to the executing authorities, not just at the district headquarters but also to the fire, police and medical services, as well as Mamlatdars of the affected areas.

The value of follow-ups with the government authorities and fire, police and medical services after first information has been given, is

emphasized. Giving accurate information to the media helps control spread of misinformation, rumours and panic, they are told. On receipt of information about a natural disaster, they also inform the local All India Radio (AIR) center, which has extensive outreach into remote areas and even to fishermen who may be in the sea. Also, that at all times the officer-in-charge of the EOC, and not the peon must respond to telephone enquiries is another unwritten rule at the Jamnagar EOC. Mobile telephone number of the District Collector and DDMO are a prominent fixture under the table glass top.

EOCs now are equipped with Computers, Generators, FAX, Photocopier, walkie-talkie set, hotline with state EOC, EPBX, Television sets, radio sets, HAM radio and a torch.

EOCs are going in for structural upgradation as well, under the UEVRP, which will be another major step towards DRM institutionalization. For Dinesh Bhai Seth, civil contractor since 30 long years, this is a type of construction he has never undertaken before. The 4000 sq feet EOC structure has 38 ultra strong pillars that go 7.6 feet below the ground level. Fifty kgs (one bag) of cement will call for 86 kgs of small stone chips, 57 kgs of medium chips and 71 kgs of fine aggregate, " and the building with this mix is going to give any earthquake a run for its net worth," is Dinesh Bhai's claim.

Strength: *The purpose of including trainings and attempting to develop HAM radio expertise as an amateur hobby within the community is to develop an alternative communication system and expertise during the time of disaster. Ham radio is particularly useful in rural areas when other means of communication normally fail. During the 2001 Bhuj earthquake, it was HAM radios, which kept alive whatever communication it could when all other channels had broken down.*

The DRMP has initiated a concerted effort in Jamnagar, to bring together interested civilians and has imparted a

five-days training course on use of HAM radios, at the end of which an examination was also conducted. The 48 candidates, a mixed group of government employees, teachers, traders and students, can after obtaining a license, buy the equipment at a cost of anything between 10,000 to 55,000 INR. The training content has been highly technical. The involvement of the Gujarat Institute of Amateur Radio, Gandhinagar has been a useful step. Live demonstrations of HAM Radio use in Rajkot city and a seminar in Bhavnagar too have been organized to generate interest.

G.S.D.M.A

ધાંગઢા નગરપાલિકા - ધાંગઢા

UNDP

આકૃત, કોષ્ટક ઢોષના અંતર્ગત નાન વાગુલિત અભિયાન કાર્યક્રમોનું અધ્યયન

વાવાઝોડા યકુલ શું ડરવું.

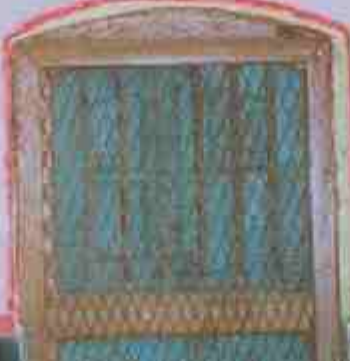
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ધાંગઢા નગરપાલિકા



Wall Painted with Do's and Don'ts

AWARENESS GENERATION

The DRM programme has unequivocally succeeded in creating awareness - among all levels of people in its target areas - that the risks of a disaster can be managed. The widely disseminated do's and don'ts through various means, some innovative, have not only educated the people about how to handle disasters of various types, but have also successfully conveyed what major human-induced and natural hazards are all about.

Certain strategic and regular local occasions have been chosen to maximize and institutionalize spread of DRM awareness. One of this is the Shala Pravesh Utsav (school enrollment drive), in which children are accompanied to school by their parents. Students put up skits and short plays, participate in drawing competitions on the do's and don'ts of the specific hazards the area is vulnerable to.

The other occasion seized for awareness generation in Junagadh, is the Krishi Rath (Agriculture Chariot) that

moves through numerous villages with information about new agricultural techniques and know-how, as well as about new varieties of seeds. Huge quantities of DRM IEC materials are distributed in selected vulnerable areas through this medium. Similarly, the International Day for Natural Disaster Reduction on 11th October is tapped for a broad based awareness generation through rallies, competitions, debates; film shows, wall displays and even simple students' research projects are launched. Religious congregations, fairs and festivals also present a good opportunity to inform and educate people.

Knowing doctors would be unable to give time to come to an orientation meeting, in Junagadh, the DRM team devised a doctors' orientation in an innovative way by distributing IEC materials about a doctor's role during a disaster with a covering letter from the Joint CEO, GSDMA. The patients' escorts would inevitably get to read them, when they wait outside the Doctor's chambers. Two hundred doctors and the visitors were oriented in this way. Similar practice is adopted in all the other six municipal corporations viz., Ahmedabad,



A Hoarding on Disasters, for Awareness Generation

Vadodara, Surat, Rajkot, Jamnagar and Bhavnagar covering more than 2000 hospitals and clinics. Similarly, the DRM team targeted barbers. But they chose only those who had three chairs for their clients. In such shops at least two clients who would be waiting for their turn, would be provided DRM IEC material to read during that time. Such was the popularity that some barbers even replaced the filmi posters with DRM ones inside their shops, so that clients could look and learn from the illustrations while they were being attended to.

'Chakkda' the motorcycle fitted with mini trolley carrier that carry up to 8 people, is an indispensable means of transportation from remote rural to urban and semi-urban areas in Junagadh. Chakkdas are powerful but unstable contraptions, that often have no hind indicator light, rendering it prone to accidents especially during the night time. The DRM programme and Junagadh Municipality Corporation tagged fluorescent red tape stickers to 227 of these Chakkdas and State transport buses to increase their visibility. Earthquake related awareness have also been displayed through the State transport buses too.

In Anjar Nagarpalika of Kachchh district in seismic zone V, the do's and don'ts of earthquake are printed on the reverse side of the municipality house tax receipts, which reach a large number of residents and are preserved by them as part of house ownership record.

IEC materials on disaster management have been prepared under the DRM programme in large numbers in Gujarati and English languages. The effort to produce more IEC materials in the State language has helped in ensuring that the information reaches a wider and the more vulnerable sections of population.

Some festivals like Diwali and Makar Sankranti become the subject of awareness campaign themselves, owing



Awareness Generation

to the hazardous situation they could create. While fire injuries are not uncommon during the festival of lights and crackers, kites flying competitions usually from rooftops are a common activity during the Makar Sankranti. Accidents of falling-off rooftops are reported during this time. Diwali Fire Safety and Safe Kite Festival awareness campaigns are also undertaken. In Jamnagar, during Diwali only two burn cases were reported. Over the past year, awareness about do's and don'ts during earthquakes and buildings safety norms have been undertaken through various fora and methods.

The prescribed awareness generation methods and mediums like public exhibition, various kinds of competitions like essay writing, debates, painting; posters, information booklets on hazard specific do's and don'ts; wall paintings in busy public places, information stickers, audio-visual shows on cable TV channels and public gatherings, traditional folk media and mass media like newspapers, radio and internet have been fully used. Awareness generation is a space in the DRM programme that allows for innovation, experimentation and localization. This opportunity has been very well utilized as is illustrated by the few examples cited above. For this, credit needs go to the enthusiastic UNDP Gujarat team.

Although there is high level of basic awareness amongst all stakeholders, still the level of internalizing and applying to real life situations to save one's life, is not very high and therefore remains a challenge. Mobilizing the community for evacuation during floods in 2006 has been admittedly a problem. Even while evacuating people, many of them did not carry their emergency survival kits with essential items, though this was an aspect which has been reiterated many a times in the IEC materials on tips for "What to do during a disaster event."

Earthquake related awareness seems to have been better internalized. As per Junagadh's DC "people may not understand the technical explanation for the lintel and plinth band or why the door and window should not be close to each other, but they do know that the houses and they, are safer with these features, and they build their homes accordingly, now".

An evaluation system needs to be put in place to monitor the impact of these efforts and expenditures. Quantity in itself is not a guarantee or accurate measure of awareness generated. It needs to be ascertained whether the undertaken measures and methods are producing the desired results or are falling short; whether they are helping the community in internalizing DRM issues and to what extent. Properly conducted mock drills are a good test of skills and knowledge gained through the DRM Programme



IEC Materials on Disaster Management

and the need to increase the frequency of such drills has been emphasized.

There is an observation among various sections of the administration in Government of Gujarat that while those departments that are directly involved in relief, rehabilitation and reconstruction are sensitized to DRM issues, those not involved need more addressal.

Strengths: *Basic awareness about DRM has been successfully generated among varied sections of population. Strategic and innovative approaches for DM communication to reach out to various stakeholders. Enthusiastic involvement of UNVs is another strength of the programme. Production of a large amount of IEC*



Do's and Don'ts during an Earthquake

materials in local language and regular documentation of DRM activities is another area of achievement.

Issues & Concerns: *There is a need to improve the quality of documentation specially focusing on the process and collation of best practices.*

Suggestions: *Post-disaster, some kind of review with DM committees at all levels needs to take place so that a comprehensive feedback is documented as to what worked and what did not and why. After almost four years of implementation, comprehensively reviewing overall measures taken and the results produced, by the implementers themselves, could be a worthwhile exercise.*



Engineers Training Programme on Earthquake Resistant Construction Technology under UEVRP in Ahmedabad

CAPACITY BUILDING

Capacity building at the community level for a multi-dimensional issue like disaster risk management, calls for a complex convergence of inputs at various levels. Capacity building is one of the three major thrust areas of the DRM programme in Gujarat.

The major focus on capacity building initiatives was to impart training to a wide range of stakeholders viz. village, taluka and district level DMTs, PRIs, senior government officials, policy makers, youth volunteers of NSS (National Service Scheme) and NYKS (Nehru Yuva Kendra Sangathan), medical practitioners, teachers, masons, engineers and architects, even fair price shop owners in the villages, on various facets of



NYKS volunteer in a Sensitization meeting on DRM

DM starting from structural safety, mitigation to life saving skills like First Aid and fire fighting.

The most visible impact of these trainings imparted under the DRM was felt during Surat flood 2006 when the trained DMTs at the various levels swung into action to save and provide support to the disaster affected people. The first aid team comprising of AWWs and Female Health workers with a wider reach at the community level made the response much better.

It was realized during the visit that most of the stakeholders knew their roles. The impact of capacity building has certainly been positive. However, with the community actively managing risks of disasters, the widespread influence of capacity building still remains a secondary issue. Linking it with livelihoods to mainstream DRM has been voiced in a few fora. In Orissa, the Gol's Food for Work programme lends itself well to this concept. The huge spread of the programme, in geographical terms as well as diverse and large number of target groups, admittedly needs time to be built up.



Women's group during a DRM Sensitization

Mandvi taluka has 60 S&R trained volunteers. Most home guards agree with the home guard Sureshbhai Patel, that though they are trained in S&R during their induction training, which may be years back, the training under DRM is a necessary refresher and value addition with learning how to use life jackets etc. Refresher training programmes are another must at all levels, particularly at the community level where volunteers trained may relocate for jobs etc. In any case one set of training lessons is not expected to be remembered for more than a year or two.

6.1 MOCK DRILLS

Mock drills reflect the level of preparedness of a community on how to respond to disasters/accidents as first responders.

UNDP Programme Associate Mr. Sarat Panda explains that, the NGOs prefer to work in the relief and recovery



First Aid Training

phases. The DRMP is alternatively trying to involve philanthropic and religious organizations, resource institutions such as Community Science Centres, professional associations, professional bodies, corporate sector, village cooperatives, school

community, general community and opinion leaders in awareness generation and for conducting mock drills.

It was also observed that the timing of the mock drill could succeed in making a substantial difference to preparedness levels. Based on the feedback received from many places, mock drills, awareness campaigns, discussions in Gram Sabhas on DRM are considered highly effective, when conducted prior to the monsoons and at a time when the VDMPs are being updated.

Pramilaben Choudhury, Sarpanch of Phulwadi village in Mandvi and member of the VDMC, said that the village cluster meeting in June 2006 just before the floods, where flood hazards were discussed, was useful as the awareness issues discussed in the meeting were fresh in the minds of the people. It may be worth considering if a range of such activities could be possibly scheduled back to back during April, May and June.



Mock Drill in Action

6.2 DEVELOPMENT OF A TECHNO-LEGAL FRAMEWORK

In Gujarat, the Gujarat State Disaster Management Act 2003 provides the legislative set up for effective disaster management. The Draft amended General Development Control Regulations (GDCR) of Bhavnagar, Rajkot, Surat and Jamnagar districts have been developed to ensure structural safety. While many techno-legal articles are at various stages of finalization, Gujarat has come out with a draft Bill for issuing license to civil engineers after the Professional Civil Engineers Bill was passed. This would go a long way in institutionalizing structural mitigation measures in the State.

The training components include philosophy of

engineering & architectural techniques and retrofitting while designing structure to ensure safety against natural hazards like earthquakes, floods and cyclones. The programme also imparted training to the SSA engineers to ensure construction of hazard resistant schools under the SSA programme in the schools.

A series of trainings have been conducted under the UEVR project for engineers from government departments, supervisory engineers deployed in earthquake affected regions and private engineers working with NGOs on constructions.

6.3 SCHOOL SAFETY

Post Gujarat earthquake, it may have seemed just enough to repair and reconstruct more than 50,000 classrooms that had been damaged. But what was the answer to the many students who lost their lives and those who were grievously injured due to collapsed school walls. The unsettling question was, would the



IEC Materials on School Safety

human casualty have been reduced if the young students had some knowledge of how to cope with the calamities that often come unannounced?

A multi-pronged and holistic school safety initiative was put into action in November 2005. The comprehensive action plan prepared responds not just to the physical vulnerability of students, through strict conformity to structural mandates; but invests equal if not more inputs to generating awareness, preparedness and building coping capacity, among the vast community of students, teachers and staff as well as parents.

The Chief Minister of Gujarat has pledged to make all schools safe by the year 2010. After structural upgradations and training programmes are upscaled,



School Level Mock Drill

quarterly school safety audits are going to be a regular feature in both government and private schools.

Teachers have been trained under the GoI-UNDP DRM programme to strengthen the education curricula for schools to incorporate DM as a subject. Running simultaneously and providing integrated support to the GSSI, this activity is targeted to build capacity of the teachers across all 25 districts of the state, among the other important stakeholder groups. The project aimed at a ripple method. Rural schools were given equal importance to get trained in schools safety. Selected teachers received Training of Trainers (ToT) on general disaster management, first aid, search and

rescue, evacuation and mock drills. Interactive sessions with the trainee teachers were held on relevant topics like awareness programme for disaster management, safety measures to prevent fire in and around school, safety measures pre, during and post cyclone with heavy rain, about community-based disaster management, about organizing programme in school about Disaster Management as a subject / how to develop lesson plan.

Strength: As on date 20,413 teachers are oriented and trained in disaster management under DRM programme. Over 300 mock drills have been conducted at school level; 24 district level training programs completed-550



Lifting Techniques Demonstration during a Mock Drill



A Model Prepared by a School Boy Depicting Earthquake Resistant Features

teachers have been trained, 23 model schools have been selected, 10 teachers and 500 students have been trained in each model school.

There are 37671 primary school with 8.266 million (82.66 lakh) students and 7718 secondary and higher secondary schools with 2.464 million (24.64 lakh) students.⁶



School Level Disaster Management Team Members

PARTNERSHIP WITH THE CORPORATE SECTOR

Earlier this year when Mr. Roopwant Singh joined as Sub-Divisional Magistrate (SDM) in Veraval, the industrial hub of Junagadh district, a spring-cleaning of his office chamber uncovered a document from a dusty top shelf. Mr. Singh says his surprise only mounted as he sifted through the 85 odd pages of the meticulously worked out document of a Local Off-site Emergency Plan, for handling emergencies in 70 chemical units in Veraval zone III. It had been initiated by the Local Crisis Group (LCG) in 2002, completed in 2004 as per the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 and gathering dust since then. This no doubt was indicative of the low priority accorded to industrial disaster preparedness even 3 years back in areas designated as high-risk.

Soon after, SDM Mr. Singh ordered a mock-drill for Ammonia gas leakage in a busy area of Veraval. In the intervening period, the DRM programme had made inroads in creating awareness about disaster preparedness and emergency response. The mock drill went in clockwork precision - the place was cordoned off, the fire tenders reached in record time, the hospital

was informed and was prepared, and the public behaved responsibly.

Gujarat leads the way in the paradigm shift within the country's corporate sector towards DRM. The new approaches are based on the premise that, development in any sector including the corporate sector cannot be sustained and remain viable, unless risk reduction and mitigation measures are built into its growth process. The 2001 Gujarat earthquake, severely affected the corporate sector, with economic losses estimated at 5000 crores INR. Nearly ten thousand industrial units went out of production and the rest operated at half their capacity. The Gujarat cyclone earlier had similarly wiped out 2500 crore INR in economic losses.⁷

Such debilitating setbacks brought home to the corporate community that investment in protective measures for economic, human and physical infrastructure is much more cost effective than expenditure on relief, rehabilitation and reconstruction, which were the corporate sector's earlier response to disasters.

Today, the corporate sector in Gujarat is practicing what the National Disaster Management Framework drawn up by the Ministry of Home Affairs, Government



Mutual Aid Scheme Members

of India envisaged for the country's corporate sector. The national strategy believes that the corporate sector is an integral part of the society and can contribute to sustainable development by integrating social concerns into its business interests. It can play a lead role in building the knowledge, capacity and skills of the community related to prevention, mitigation and preparedness, in dealing with natural and human-induced disasters, including industrial disasters.

Large and some small industrial houses in Gujarat have been scaling up activities of community awareness generation and capacity building for its employees, as well as for the local community, pegging them high on their Corporate Social Responsibility agenda. The thrust of their awareness generation is essentially on human-induced disasters, mainly chemical and fire accidents, which can be highly disastrous, as the Bhopal gas tragedy has shown. A large number of industries in Gujarat are petrochemical, chemical and dye based. The corporate sector has thus broad based the DRM programme.

Another major achievement of the DRM programme has been the corporate sector partnership with the administration in the implementation of the DRM activities. Though the public-private partnership works at various levels, it is best exemplified by the Local Crisis Groups (LCG). LCGs in Gujarat are integrated working groups or safety forums in industrial areas, consisting of key government functionaries such as the Deputy Collector, Junior Inspector of Factories or Deputy Director, Industrial Health and Safety, depending on the town or city status of the area, Medical Officer, Fire Officer, Deputy Executive Engineer, Gujarat Electricity Board and middle level officials from the local Municipal Corporation.

Representatives and experts from local industrial majors as well as NGO members complete the group, which is headed by the Sub Divisional Magistrate. An active group meets regularly to discuss and implement upgradation of skill sets and knowledge base regarding prevention, response and preparedness for industrial and chemical hazards. It acts as the nodal body during emergencies.

Such partnerships are beneficial in more ways than one for all stakeholders. Working with the government brings the DRM activities into the 'public' domain, simply because the industrial establishments in general are perceived as the 'other' sections of the community. They benefit by getting a pro-community image and the community benefits from their technical expertise, infrastructure and equipments when they hold off-site mock drills for the communities, which reside within the risk area. Pocket-sized booklets of do's and don'ts for their employees,

which hold relevance for at-risk neighbouring communities are distributed amongst them too.

Bharuch district has the most institutionalized DRM-corporate - government partnership. The corporate sector runs Disaster Prevention Management Centre (DPMC) in Bharuch, playing a pivotal role in disseminating and upgrading information about industrial and chemical hazards. It also trains industrial personnel. During normal times it works in improving school safety by organizing rallies, conducting mock drills with in-house technical experts and provides technical guidance to LCGs. DPMC is equipped with a good library and modern industrial emergency fighting light and heavy equipments. Considering its credibility GSDMA will soon be providing it a HAZMAT (Hazardous Material) van, a multi-utility emergency response vehicle fitted with the latest gadgets costing 15 million (1.5 crore) INR.

The four LCGs in Bharuch, also partner with DRM activities in many ways. This group facilitates prompt collection and relay of updated data regarding resource inventory of industries for SDRN and IDRN data entry. They maintain a consistent two-way flow of information with GSDMA on preparedness initiatives, action points taken by them at various workshops and seminars involving member industries, local administration and citizens groups and mock drills, etc.

The DRM programme in Jamnagar, has integrated well with the district industries group, converging under an umbrella NGO called Mutual Aid Scheme (MAS). Formed in 1990 to help each other during emergencies, this group now works unitedly with the district administration to ensure industrial safety. The larger industries like Reliance Industries Ltd, Indian Oil Company Ltd, Tata Chemicals Ltd, Gujarat State Fertilizer Corp Ltd, Essar Oil Ltd, Gail (India) Ltd and others are more active members of this group.

Oil spills, ammonia gas leaks, industrial fires are in focus during awareness drives among school children, salt workers and fishermen and panchayat and community members. 3-4 villages at-risk, within a 7 km radius of the industries are targeted during these awareness drives.

The impact of these has already been seen. A fire in a seven-storeyed building in Jamnagar was doused by residents even before the administration could reach the site; 2006 Diwali saw no fire mishap as against 15 to 30 cases in earlier years; kite festival during January Makar Sankranti which sees public kite-flying competitions and a number of falling-from-roofs accidents saw a minimal number in January 2007. MAS plans to set up a fire training field with entire sets, gas chambers and fire tenders at a cost of 15 crores INR.

The corporate sector too has contributed to masons training in earthquake resistant housing techniques. Ultratech Cement and Sanghi Cement have variously chipped in by paying the participating masons daily wages during the training period.

The DRM awareness generation has been succeeding (many industries, the medium and small ones in particular are still not involved) in making the corporate entities conscious of their responsibilities towards their employees. The emphasis, irrespective of geographical location is clearly on on-site fire hazards because they inflict maximum loss on the industry itself; e.g. Tata Chemical Ltd in Mithapur, Jamnagar lost 84 crore INR in a factory boiler fire in 2001.

As a second step, under corporate social responsibility, generation of community awareness, preparedness and capacity building through off-site mock drills would be a timely social contribution. With trained human resources, equipments and the LCGs, the corporate entities are eminently suitable to take on a major chunk of responsibility in future for various off-site mock drills in districts where they have a presence.

Case Study

When sensitization does not work, the law does

In the single quarter from January to March 2006, three trucks carrying ammonia belonging to Reliance Industries Ltd turned turtle on the national highway No. 8A that runs from Jamnagar to Kandla port and Mumbai. The Khichidia by-pass U-turn, which unfortunately has no indicative signboard, is the spot for most industrial carriers' accidents. The District Administration has to undertake the entire rescue and towing exercise, locating and

summoning the crane to remove tankers from the busy highway. Chemical containers overturning and posing a gas leak hazard for the public is not uncommon. On an average two to three such accidents occur every month.

DDMO Mr. Dhananjay Goswami thought it was time the industries were made to take the onus of their actions. Suggesting an action plan to the District Collector a meeting was called involving the industrialists, the administration and the controlling agencies - fire services, the Road Transport Officer (RTO) and officials from the Road and Buildings department.

The industrial representatives had their argument ready, that they do check the appropriate license of the driver, the roadworthiness of the carrier and only then send it on-road. But after it is loaded and leaves the industry's gates, their responsibility ceases. From then on till it reaches the destination the transporter is the one who is answerable, they pleaded.

The Collector now resorts to the Negotiable Instruments Act, which fixes responsibility on the owner of the goods, till such time it reaches its destination. From March 2006, the industries have been asked to identify the availability of a crane before dispatching carriers. They are required to designate a nodal officer, who will be on call for 24 hours and 365 days for emergencies. Moreover, the RTO and Police will maintain a list of all the defaulting carriers and if any industry is found defaulting a second time, the District Collector will take action against the industry. All such actions are being taken with the provisions in the Disaster Management Act and in the interest of public safety.



Turning to Opportunities, Let the People Decide

INTEGRATION OF DM WITH DEVELOPMENT PLANNING AND PROGRAMMES

The paradigm shift adopted in DM by Government of Gujarat (GoG) post 2001 earthquake was to integrate and institutionalize disaster mitigation efforts with mainstream developmental plans and activities. The results of the same are already visible.

The largest of these initiatives is to be seen in the Below Poverty Line (BPL) public housing scheme under Indira Awas Yojana (IAY) and Sardar Awas Yojana (SAY - introduced from April 2001). These cost-effective one-room houses now proudly sport a concrete plinth and a lintel band, that strengthens it against earthquake tremors. In flood prone areas, these houses will hold out much longer than the earlier mud huts. In places like Junagadh, where yellow sandstone is plentifully available, the walls are made of dressed sandstone blocks. It is now mandatory that these houses be built with earthquake resistant technology.

While in other States, the houses constructed under IAY costs 22,000 INR and is funded by the Central government, in Gujarat IAY and SAY houses costs 40,000 INR because of the added disaster resistant features. The Government of Gujarat contributes the differential cost of 18,000 INR.

Mr. Ashwini Kumar, District Collector Junagadh asserts that *"mitigation has in fact become a part of the developmental process. In talukas and villages, not just IAY and SAY housing but PHCs and schools are adhering to the earthquake resistant construction regulations."*

The true test of this paradigm shift however lies in the integration done at the panchayat level. In Gandvi, as



Earthquake Safe House under Construction under Indira Awas Yojana

in many other villages, the Panchayat, after the DRM programme awareness, tries to ensure that new houses (of the poor mostly) do not come up in low-lying areas. Despite this, many families remain in these



An Earthquake Resistant House under IAY

vulnerable localities as they refuse to relocate.

The other initiative that many local self-governments are undertaking, is metaling the internal mud road to low-lying and outreach habitations, in order to keep intact the communication during floods. In Gandvi, the village has three safe shelters - two schools and an 18 X 20 feet community hall, which are rebuilt on new structural specifications.

Puna Bhai, Sarpanch of Thalighed village in Mangrol block of Junagadh district, says that the panchayat recently added four feet to the height of the village road, because the village is at the lowest point of the saucer-like topography of the area. Village roads would remain inundated with the slightest rainfall and remain water-logged during the entire monsoon months. This work was done under the Pradhan Mantri Gram Sadak Yojana, a central government road communication development scheme.

Change is slow but the tone for integration is set. At the grassroots, the approach of the people has been proactive. In most places, there is synergy on issues pertaining to disaster risk reduction.

In the cyclone prone coastal villages in Mangrol block, bridges are now made of reinforced concrete cement (RCC). The earlier stone and lime construction materials have been discarded. Public water supply tanks are now built at even greater heights, so that prolonged power cuts during emergencies do not affect water supply to the community. Kerosene fueled mobile pumps locally known as 'machine oil engines' fill the tanks during those periods.

MJ Mayatra, the Taluka Development Officer (TDO) of Mangrol Taluka, is concerned for those long-term improvements that require heavy investment. Like the 200 sq km area in Madhupur, which is a low-lying coastal area, flanked on either side by the rivers Madhuwati and Ozat, that drain into the sea through the creeks. The perennial flooding here requires that all houses in 40 coastal villages need to be built on heights of at least 4 to 5 feet.

There are other larger problems that panchayats are grappling with. In earlier times, Mangrol was known as the Kashmir of Saurashtra, much has deteriorated in the last 15 years due to over killing from ground water extraction. With sub-soil water decreasing, the salinity of ground water has increased. Besides drinking water problems, agriculture yield too has fallen drastically. Where one bigha (1600 sq yard) of peanut cultivation used to produce 1000 kilograms of nuts, today the farmer gets just a tenth of that.

NGOs too are pitching in. Dug wells are being recharged through rainwater harvesting and check water dams are other remedial measures that Aga Khan Foundation, an NGO has started in partnership with the people.

8.1 MERGING WITH GOVERNMENT PROGRAMMES

From the view of community perception, one of the most visible characteristics of the DRM programme is its almost seamless merging with the Government of Gujarat's DM programme. UNDP's PSOs in many of the villages, are referred to as 'GSDMA's Project Officers'. In the village communities, GSDMA and not so much UNDP is known as the implementers of the programme. This is a major strength of the programme that the DRM programme it is seen as a government initiative and synergies towards it are very well integrated.

GSDMA is the acknowledged and the empowered (through the Gujarat State DM Act 2003) implementing agency and lives upto its role as such. This situation is quite different from that seen in Orissa where Orissa State Disaster Management Authority (OSDMA) and UNDP are clearly seen as two distinct identity players with UNDP perceived as the key player. However the DRM programme's institutionalization, outreach and not the least the financial input, in the two states, is vastly different and a comparison is untenable.

Also when seen as a government programme, it is more acceptable by the people; it is well known that there is a vast difference in public perception of a programme depending on it being a government or a non-government one.

The DRM programme is seen as integrated into other departments very closely in various ways, helps in further institutionalization. Areas where integration is seen in considerable measures are awareness generation, for infrastructure (earthquake safe buildings mostly), for training and capacity building and for technical help. So much so that even the corporate sector is, of late moving into close partnership with the DRM programme implementation process by way of creating awareness, helping with technical human-power and in providing heavy equipments for training and conducting mock drills. Conduction of mock drills is an area where further involvement of corporate sector could be explored.

In Junagadh, all village level primary and secondary schools are being built with the earthquake resistant technology and with funds provided by Sarva Shiksha Abhiyan (SSA), the flagship educational programme of the Gol. The GoI-UNDP DRM programme component



under Gujarat School Safety Initiative (GSSI) of teachers training and School Planning process too, partners heavily with the Department of Education. The Panchayat department, Roads & Buildings, Irrigation, Health, Fire and Emergency Services are some other departments with whom the DRM programme is closely integrated.

The DRM is also integrated with State institutions like Gujarat Institute of Disaster Management (GIDM), which, according to CEO, GSDMA, holds the potential to be crucial to the DRM programme's sustainability. It is an institution that can, he considers, possibly take forward the work now being executed by UNDP in Gujarat.



Community Preparedness.... A Way of Life in Gujarat

CONCLUSION

Gujarat state being one of the forerunners for implementing the DRM programme in partnership with Government of Gujarat is undoubtedly a flagship for the state in showing the way to newer entrants for achieving the programme goals.

Outstanding are many of the meticulous lessons learnt while establishing the strong institutional foundation put in place by the programme implementers. The DM policy and DM Act imparts an authoritative and legal structure for functioning of DRM administrative deliverables. The framework together has paved the way for sustainability of DRM programme in the state.

A number of programme components, though satisfactorily implemented over the initial years, need to be taken forward more precisely in context of Gujarat's disaster risk reduction scenarios. In order to take the roots deeper, as one phase of having the community and administrators sensitized and learnt the alphabets of DRM, now need to exclaim the second phase of practicing the internalization processes of DRM.

In Gujarat the provision of funds for disaster management and risk mitigation plan outlay has always been positive, leading the road forward to a long term DRM institutionalization and sustainability. Also the dynamic state level governance resolutions have been a substantive hand holder support for the programme. However, the road to attain the ultimate goal of a disaster resilient community is a long way ahead and the DRM community in Gujarat cannot call it a day as yet.

ACRONYMS

AWW	- Anganwadi Worker
BMPTC	- Building Materials Promotion and Technology Council
BPL	- Below Poverty Line
CBO	- Community Based Organization
CDMP	- City Disaster Management Plan
CEO	- Chief Executive Officer
CRPF	- Central Reserve Police Force
DC	- District Collector
DDMO	- District Disaster Management Officer
DDMP	- District Disaster Management Plan
DM	- Disaster Management
DMT	- Disaster Management Team
DRM	- Disaster Risk Management
EOC	- Emergency Operation Centre
EPBX	- Electronic Private Branch Exchange
GIS	- Geographic Information System
GoG	- Government of Gujarat
Gol	- Government of India
GSDMA	- Gujarat State Disaster Management Authority
GSDP	- Gross State Domestic Product
GSSI	- Gujarat School Safety Initiative
GSWAN	- Gujarat State Wide Area Network
IAY	- Indira Awas Yojana
ICDS	- Integrated Child Development Services
ICS	- Incident Command System
IDRN	- India Disaster Resource Network
IEC	- Information Education and Communication
INR	- Indian Rupee
IT	- Information Technology
LCG	- Local Crisis Group
NCC	- National Cadet Corps
NGO	- Non-Governmental Organization
NSS	- National Service Scheme
NYKS	- Nehru Yuva Kendra Sangathan
ORS	- Oral Rehydration Solution
PHC	- Primary Health Centre
PRI	- Panchayati Raj Institution
PSO	- Project Support Officer
RCC	- Reinforced Concrete Cement
SAY	- Sardar Awas Yojana
S&R	- Search and Rescue
SC	- Scheduled Caste
SDMP	- School Disaster Management Plan
SDRN	- State Disaster Resource Network
SER	- Socio-Economic Review
SHG	- Self Help Group
SMC	- Surat Municipal Corporation
SMS	- Short Message Service
SOP	- Standard Operating Procedures
Sq.Km	- Square Kilometre
SSA	- Sarva Shiksha Abhiyan
ST	- Scheduled Tribe
TDO	- Taluka Development Officer
TDMC	- Taluka Disaster Management Committee
TDMP	- Taluka Disaster Management Plan
TDMT	- Taluka Disaster Management Team
ToT	- Training of Trainers
UEVRP	- Urban Earthquake Vulnerability Reduction Project
ULB	- Urban Local Body
UNDP	- United Nations Development Programme
UNV	- United Nations Volunteer
USAID	- United States Agency for International Development
VDMC	- Village Disaster Management Committee
VDMP	- Village Disaster Management Plan
VDMT	- Village Disaster Management Team

All figures and Statistics quoted in the introduction section of this document are sourced from the Census of India 2001, and the Socio-Economic Review, Gujarat State 2005-2006, published in February 2006 by the Directorate of Economics and Statistics, Government of Gujarat. This source will be referred to as Social-Economic Review, Government of Gujarat 2005-2006. Sources other than the above are mentioned below:

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About the Millennium Development Goals (MDGs)

The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world's main development challenges. The MDGs are drawn from the actions and targets contained in the Millennium Declaration that was adopted by 189 nations and signed by 147 Heads of States and Governments during the UN Millennium Summit in September 2000.

Millennium Development Goals

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development



About UNDP

UNDP is the UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. We are on the ground in 166 countries, working with them on their own solutions to global and national development challenges.

Community-based Disaster Reduction and Recovery through Participation of Communities and Local Self-Government

The Disaster Risk Management (DRM) programme essentially aims to contribute towards the social and economic development goals of the National Government by enabling the selected multi-hazard States to minimize losses of development gains from disasters and reduce vulnerability. The programme emphasizes sustainable disaster risk reduction in these States by building capacities at all levels to institutionalize the DRM system in India.

The broad programme objectives are:

- Capacity-building to institutionalize systems for DRM in the Government;
- Awareness generation and educational programmes in disaster reduction and recovery;
- Preparedness and mitigation plans for DRM at state, district, block, village and ward levels in 169 multi-hazard prone districts of 17 selected States of India; and
- Networking knowledge on effective approaches, methods and tools for DRM, developing and promoting policy frameworks at State and National levels.

These objectives are being achieved through the community based disaster management initiatives, networking, which harnesses the synergies among institutions and organizations, empowerment through education and public awareness campaigns.

The ongoing successes in scaling up the best practices in disaster management for enhancing the resilience of the communities to disasters are beginning to create a revolution and favourable impact, benefiting large geographical area and communities.



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