
disaster risk reduction

A COMPILATION OF LITERATURE
FOR USE OF PRACTITIONERS

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FIRST EDITION. 500 copies

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PUBLISHER:

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PUBLICATION SUPPORT: Malteser International

DESIGN & LAYOUT: Solution One Designworks, Ahmedabad

maps: Jenskin Jeyamani

PRINTED AT: Print Vision Pvt. Ltd., Ahmedabad

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This compilation is primarily made to build community capacity for disaster preparedness and mitigation. Due care has been taken to cite references. However, in case any reference is found missing, authors and publishers kindly overlook. This compilation shall not be used for any commercial purpose.

FOREWORD

In recent years, there has been a major shift in the articulation of disaster related conceptual frameworks and practices. Disaster Risk Reduction (DRR) is an integrated approach to disaster response and mitigation, based on entitlements and endowments. In the global and national policy environment, there has been greater emphasis on building community resilience to reduce vulnerability. However, various studies and evaluations indicate the gaps between the conceptual base and practice at the ground level.

In this attempt for compilation of literature, an effort has been made to provide a systematic understanding on the newly evolved concepts and frameworks on disaster risk reduction. We understand that without practice at the community level, the frameworks and concepts will remain and continue to be amorphous. Through these readings the practitioners will not only be familiar with the recent terminology and concepts but will also be able to integrate these with the community level practices.

We hope that this compilation does not remain at the level of use of terminology only, but enables in demystifying the knowledge base and also empowers the community level practitioners. Theory and practice always go hand in hand. Field practitioners may use the frameworks for systematizing their practice. If any section of this booklet hinders the practice please ignore it as no learning process is more beneficial as learning through experience.

The users of this compilation are requested to share their practices, so that we collectively build a body of knowledge on disaster risk reduction.

Binoy Acharya
UNNATI . March 2008

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Understanding Disasters

Disasters have become a frequent phenomenon in India. During the past ten years, we have witnessed high profile disasters like the Orissa super cyclone, Gujarat earthquake, Indian Ocean Tsunami, Kashmir earthquake, Mumbai floods and the recent South Asia floods. These disasters have taken huge toll of life and property and have attracted high national and international attention. There are other recurrent disasters in India like the floods, cyclones, landslides and fire. Also, India experiences the silent and continuing disasters like droughts, epidemics, starvation and infant mortality. All these catastrophes take a heavy toll of life and have become a great cause of concern for the people as well as the government.

Over the years, a paradigm shift has occurred in the theory and practice of disaster management. Earlier disasters were treated as a one time event with focus on geophysical and engineering knowledge without considering the social and development aspects. Gradually the attitude shifted towards preparedness with emphasis on 'contingency planning' and relief supplies. However, as disaster losses continued to increase, there is a shift from response approach to a more proactive attitude. It is now being understood that disasters are related to vulnerability of the people, which in turn is dependent on the development pattern of the region.

With the experiences and new learning's in the field of disasters, there is demand for a human rights approach with focus on vulnerability reduction. It is therefore extremely important that we follow the mantra of 'Disaster Risk Reduction', which means we PLAN, and undertake ACTIONS in a manner which reduces vulnerability and helps to prevent hazards from taking the shape of a disaster. Though we have moved ahead in theoretical construct, there is still a long way to go before substantial achievement is made in building resilient communities and a safe living environment.

Many of us, who start probing deeper into the subject area, find themselves amidst many queries like: Are natural disasters a consequence of the natural forces or are they a result of human activities? Do disasters differentiate between developed and developing countries or are disasters a manifestation of the development activities? Do disasters discriminate among communities and between men and women? A frequently asked question by many individuals is how I can be prepared to deal with such events. How can I contribute for reducing disaster risk? Here we will encourage such analysis so that participation in disaster risk reduction as a community or as an individual becomes an easier process. Let us start by understanding the specifics of disaster and its interrelationship with other disciplines.



What is Disaster?

Disaster is an extreme state of everyday life in which the continuity of community structures and process temporarily fails. It is a state of serious disruption of the functioning of the community causing widespread losses which exceeds the ability of the affected community or society to cope using its own resources.

An event becomes a disaster when it causes huge damage to either life or property or both. A flood or an earthquake is not a disaster in itself but when such an event or a combination of events disrupts normal functioning of a community causing human, material, economic or environmental losses, it leads to a disaster.

Often we have the confusion in the terms 'disaster' and 'hazard'. It should be understood that a hazard is not a disaster but has the potential for becoming one, if the emergency caused by it is not managed well due to a lack of preparation. **The event or the phenomenon which has the potential to cause a disaster is referred as hazard.**

Hazard and Disaster Classification:

There are different kinds of hazards and disasters and they can be broadly classified as:

NATURAL HAZARDS result from natural processes in the environment. They have the potential to create an event that has an effect on people. Based on processes, they can be further categorized as:

- **Geological Hazards** such as earthquakes, tsunamis, volcanic eruptions, landslides and avalanche.
- **Hydrological hazards** such as floods.
- **Climatic Hazards** such as tropical cyclones/ hurricane, drought, heat wave, tornado, hailstorm.
- **Wildfire**
- **Health and disease** such as epidemics (SARS, Flu, AIDS) and famine.

Here it needs to be emphasized that not all natural hazards are based on truly natural phenomena, that is, where people have no influence on their occurrence. For example, while earthquake, tsunamis, cyclone, heat and cold waves are due to natural processes, the others are induced or aggravated by a combination of extreme natural events and human interventions. They can be called as **socio-natural hazards**. They can come with and without human intervention for example forest fires, floods and landslides.

MAN MADE HAZARDS are caused due to human intent, activities, negligence or interference with the environment or even due to failure of a system. Man-made disasters are the result of man-made hazards for which adequate emergency management measures have not been adopted. They can be categorized as:

- **Sociological hazards** such as communal riots, ethnic conflicts, terrorism, war, crime
- **Technological hazards** such as industrial hazards, structure collapse, fire, accidents, Chemical Biological Radiological Nuclear (CBRN) attack

Another distinction for hazards can be made based on the time factor of the event like sudden and slow onset hazards. It is related to accumulation of warning signs and vulnerabilities over time:

SUDDEN ONSET HAZARDS have short or no warning and cause immediate damage. Examples are earthquakes, tsunamis, floods, tropical storms, volcanic eruptions, and landslides.

SLOW ONSET HAZARDS which act slowly and the damage either immediate or develops over longer time period. Examples are drought, famine, environmental degradation, desertification, and deforestation.

Here are some of the commonly used icons for depicting hazards:

GEOLOGICAL HAZARDS

- Earthquakes
- Tsunamis
- Volcanic Eruptions
- Landslides



CLIMATIC HAZARDS

- Tropical Cyclones
- Floods
- Droughts



ENVIRONMENTAL HAZARDS

- Environmental Pollution
- Deforestation
- Desertification
- Pest Infestation



EPIDEMICS



INDUSTRIAL ACCIDENTS

SOURCE:
Disaster Management
Training Programme
(DMTP), UNDP

Disaster, Vulnerability and Development

Here we try to understand why hazards become disasters and how disasters are linked with the component of development. This will also help us to analyze the linkages of disasters with hazard, vulnerability, coping capacity and development.

Components of disaster risk



SOURCE:
*Disaster Risk Management, Working
 Concept by GTZ GmbH*

Why do hazards become disasters?

A hazard becomes a disaster only when communities, countries and structures are too weak and vulnerable to withstand its force. Overall impact of a disaster is determined by the interaction of hazard with factors like degree of vulnerability and resilience of communities. Hazards of similar nature or magnitude can have varying impact on communities.

EXAMPLE 1 Japan has been experiencing numerous earthquakes and tsunamis. However, the scale of loss and damage in Japan is far less as compared to the tsunami or an earthquake of same magnitude experienced in India.

EXAMPLE 2 In 1993, the Marathwada earthquake in India caused 10,000 deaths and 200,000 households were affected due to damaged property and houses. However, a technically much more powerful earthquake in Los Angeles in 1971 caused about 55 deaths.

<p>Disaster Risk Expected damage and loss (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) due to a particular hazard.</p>	<p>Vulnerability Set of prevailing and long-term factors, conditions and weaknesses, which adversely affect the ability of individuals, households, organizations and the community to protect itself, cope with or recover from the damaging effects of disasters.</p>
<p>Hazard Natural, manmade or socio - natural event which has the potential to cause a disaster.</p>	<p>Coping Capacity The strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster.</p>

These examples highlight that the magnitude of the hazard does not determine the overall impact in a disaster situation. The risk scenario, that is, the probability of a disaster occurring and resulting in a particular level of loss, is largely dependent on factors like vulnerability and coping capacity of the people.

$$\frac{[\text{HAZARD}] \otimes [\text{VULNERABILITY}]}{[\text{CAPACITY}]} = [\text{DISASTER RISK}]$$

The relationship shows that Disaster Risk is directly proportional to Vulnerability. It means that disaster risk of a social group exposed to a particular hazard can be reduced by minimizing their vulnerabilities and building high coping capacity. This is also known as **Disaster Risk Reduction formula** and is being widely used as a development framework.

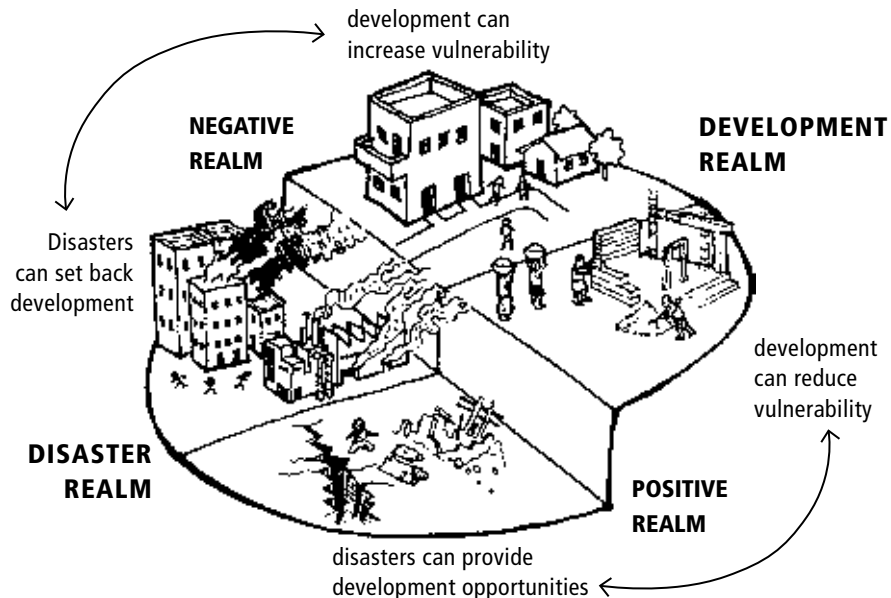
Development and disaster linkage

Various studies have indicated that loss of lives and livelihoods due to natural disasters is higher in the developing countries. It is estimated that more than 90 percent of disaster deaths take place in developing countries. It can be inferred that disasters are closely linked with the development pattern of the region. Let us understand the disaster and development relationship with the help of the following diagram (see figure below). It shows both the positive and negative dimensions of development and disaster.

POSITIVE ASPECTS ::

Development can reduce vulnerability

Development programs if designed properly help to reduce vulnerability of the people. For example, Public buildings like schools, hospitals and housing built with strict enforcement of building codes and quality standards helps to develop a safe living environment for the people.



Similarly, Investment in transport like improvement in road capacity will help in quicker evacuation. Also, better connectivity would mean speedy delivery of relief services. Investment in communication services will help to provide early warnings to all.

Here are few points highlighting means through which development programs can reduce vulnerability:

- Strengthening of utility systems
- Ensuring hazard resistant building techniques
- Institutional strengthening and capacity building of local authorities
- Social welfare programs

Disasters can provide development opportunities-

Disasters provide opportunity to initiate development programs. For example, urban development programs initiated after the earthquake have enhanced infrastructure facilities in the affected towns of Gujarat. Also various skill development programs initiated by the NGOs have provided livelihood security to many affected people.

Following are few points which reflect how disasters can provide development opportunities:

- By creating a social and political atmosphere of change
- By highlighting the general level of underdevelopment that caused disaster
- By focusing international attention and aid on the disaster area

NEGATIVE ASPECTS ::

Development can increase vulnerability

Development programs can also increase an area's susceptibility to disasters. Such as development policies of urban growth are leading to migration in cities. However, due to poor management policies and practices there is high demand but shortage in supply of affordable land. This is leading to growth of informal settlements and slums. These settlements are often located on unsuitable locations like steep slopes, along flood plains or adjacent to noxious or dangerous industrial or transport facilities making the people vulnerable to hazards.

Setting up industries will lead to population concentration around the plant. However, in absence of proper environmental management, it can lead to increase in air and water pollution around the industry. Also, depending on the type of industry there is possibility of toxic exposure for the people living in vicinity.

In India, Bhopal Gas tragedy of 1984 is the biggest industrial disaster. On December 2, there was leakage of Methyl Isocyanate from the Union Carbide India Limited factory killing more than 2000 people instantly. About 10,000 people have died over the years and about 2,00,000 have been affected because of the gas leakage. This factory was setup in 1969 by Union



Disasters are embodied in routine decisions and behaviors and cannot simply be regarded as low probability events that may or, with any luck, may not occur.



BURTON, IAN,
*'The social construction of natural disasters: an evolutionary perspective',
in Know Risk, United Nations ISDR,
Geneva 2005.*

Carbide, as a development initiative to meet the challenges of food shortage in the country. The green revolution involved major changes in agricultural practices and was adopted to increase the agriculture productivity through provision of chemical fertilizers, pesticides and irrigation network.

Following are some points which reflect how development can increase vulnerability:

- Development of hazardous sites
- Environmental degradation
- Increased technological failures or accidents
- Imbalance of pre-existing natural or social systems

Disasters can set back development level and destroy years of development. For example, Mumbai floods of 2005 or the recent floods of Bihar in 2007 have destroyed various utility services and affected properties and livelihoods. These disasters have seriously affected the development initiatives being taken up in the region.

Following points reflect how disasters can set back development level:

- by increasing loss of resources
- by shifting of resources to emergency response
- by depressing the investment climate
- by affecting the non-formal sector

Examples of development leading to disasters or increased vulnerability

SECTOR	DEVELOPMENT ACTIVITY	RESULTS
Industry	Construction of chemical plant generating employment	Deaths due to inadvertent release of chemicals, increased health problems, hazardous or toxic waste accidents
Agriculture, Forestry and Fisheries	Introduction of new species to control pests Irrigation Schemes Increase in pesticide or fertilizer use to augment crop yields	Uncontrolled expansion of new species into environment, bringing crop failure Flooding where canals counter natural water flow Contamination of potable water supplies
Natural resources	Construction of hydroelectric dam Drilling of water wells in marginal areas	Displacement, salinization Desertification due to depletion of water level
Transportation, Communications Education	Road building in rain forests School construction on earthquake fault line	Landslides, deforestation Deaths/injuries due to structural failure
Development issues, Policy and Planning	Centralisation of planning process Concentration of tourist facilities on vulnerable coastlines, unstable hills	Famine due to lack of organization of local governments Exposure of large populations to risk of death / injury / loss in storm surge, high winds storms, tsunamis, landslides

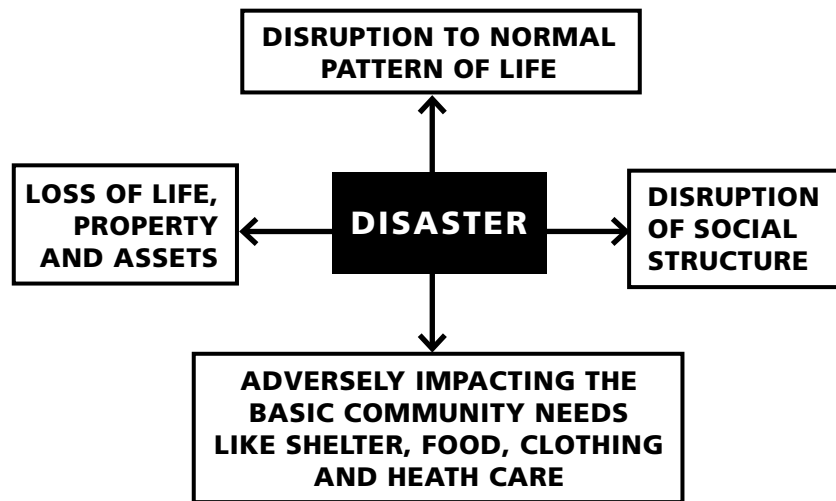
SOURCE:
Disasters and Development, training module prepared by R.S. Stephenson, UNDP/UNDRO

How do disasters affect people?

Disasters have multi-dimensional effect on human beings impacting aspects like:

- human life
- property/ assets
- living conditions
- livelihood
- social relationships
- economic activities
- social/ physical infrastructure, services
- environment

Multidimensional effect of disasters



MAJOR DISASTERS IN THE LAST 10 YEARS IN INDIA



Latur Earthquake 1993:

9,475 dead,
1 million houses damaged,
8 million people affected

Orissa Super Cyclone 1999:

10,086 dead,
2 million houses damaged,
15 million people affected

Gujarat Earthquake 2001:

13,805 dead,
1.8 million houses damaged,
12 million people affected

Indian Ocean Tsunami 2004:

12,405 people dead,
3.5 million houses damaged,
18 million people affected



SOURCE:

*'Presentation on Transforming
Disasters into Opportunities'*
Dhar Chakrabarti, NIDM

Disasters cannot be seen in isolation and require understanding about physical, social, environmental, as well as economic issues. Table 1 also shows the direct and associated impact of disasters. A multi-disciplinary approach is thus required to deal with disaster risk.

The mega disasters have attracted widespread attention but we need to consider the minor and the localized disasters also which are occurring every day like epidemics, infant mortality, starvation, etc. Though their adverse impact is much more if seen in totality, there is little or no response for them.

Immediate Economic and Social Effects of Natural Disasters, by type

TYPE OF DISASTER →	Earthquake	Cyclones	Floods	Seaquakes or tsunamis	Volcanic eruption	Fire	Drought	Famine
EFFECTS ↓								
Temporary migration			★				★	★
Permanent Migration			★					★
Loss of Housing	★	★	★	★	★	★		
Loss of Industrial Production	★	★	★		★	★		
Loss of Trade	★	★	★	★	★	★	★	★
Losses of agricultural production (plants, crops, harvests)		★	★	★	★	★	★	★
Damage to infrastructure	★	★	★	★	★	★		
Damages to market distribution and operation	★	★	★	★	★	★	★	★
Interruption of transport systems	★		★		★	★		
Interruption of communications	★	★	★	★	★	★		
Panic	★	★		★	★	★		
Social Disorder	★	★			★			★

ADAPTED FROM:
Frederick C. Cuny (1983), 'Disaster and Prevention', Oxford University Press, New York.

Disaster and its Impact

COMPONENT	DIRECT IMPACT	ASSOCIATED IMPACTS
Material / physical life	Infrastructure	Reduced mobility Access to services
	Utilities - power lines, phone lines, water treatment plants	Reduce communication Increase threat of disease
	Public facilities (schools, central business districts and downtowns, historic districts, airports, harbors, storm water systems, power plants, telecommunication centers)	Affects education (Reduced access to learning), Employment, Recreation, Economy and Public safety
	Housing	Loss of possessions and homelessness Loss of security Trauma
	Damaged medical facilities and limited access to social services, family services, and daycare	Personal trauma Increase in the number of the physically handicapped & other suffering from mental trauma
Social structure and support system	Disruption to social safety and social ties	Change in Gender roles Wage disparity between men and women Access to childcare and reproductive health facilities Incidence of domestic violence Trauma Migration Theft & other crimes; exploitation and trafficking
Economy	Disruption of business & livelihood Loss of resources	Unemployment, Shortage of basic supplies Loss of work force Disruption and increased cost of goods and services Impact on capital stock and inventory Loss of production Provision of services Inflation Retardation in economic growth, Delays to development programs Increase in debt service burden Shift in skilled human resources towards short-term recovery gains Malnutrition & other health related hazards
Environmental quality	Pollution of air and water Erosion Tree and habitat loss	Contaminated water body Reduced soil fertility Ill effect on health Desertification Loss of wild life habitat

ADAPTED FROM:

'Holistic Disaster Recovery, Ideas for Building Local Sustainability After a Natural Disaster'

by Natural Hazards Center, December 2005

KEY POINTS

- A hazard is not a disaster but has the potential for becoming one, if the emergency caused by it is not managed well due to lack of preparation.
- Disasters cannot be seen in isolation and require understanding about physical, social, environmental, as well as economic issues. A multi-disciplinary approach is required to reduce disaster risk and deal with disaster situation.
- Overall impact of a disaster is determined by the interaction of hazard with factors like degree of vulnerability and resilience of at risk communities and infrastructure.
- Disasters are closely linked with the development pattern of the region. Disasters happen where there are low levels of appropriate physical and social development.
- If development projects are not properly planned and managed it may cause a disaster. Thus development becomes a cause for disasters and ultimately increases vulnerability when the coping capacity of the community is minimal.

POINTS FOR DISCUSSION

- Can every natural event be classified as a disaster?
 - Are natural disasters a consequence of the natural forces or are they a result of human activities?
 - Can development lead to disaster resilient communities?
 - How can development lead to reduced vulnerability?
 - Are disasters a manifestation of the development activities?
 - Do disasters discriminate among communities and between men and women?
-

Addressing Disaster Vulnerability

In the previous chapter, we have seen that there is a strong interrelationship of disaster with hazard and vulnerability. Even the status of development is dependent on vulnerability issues existing in the region. These basic concepts form the backbone for disaster planning and disaster risk reduction. Though we have little ability to control natural hazards, we can focus on our actions and activities which will help us to reduce the existing and future vulnerabilities. In this chapter, we will understand in greater detail the concept of vulnerability in context of disasters.

What is Vulnerability?

Vulnerability is a set of prevailing and long-term factors, conditions and weaknesses, which adversely affect the ability of individuals, households, organizations and the community to protect itself, cope with or recover from the damaging effects of disasters. Vulnerability may exist due to many reasons such as geographic location, physical state, social exclusion and marginalization, economic instability or environmental conditions.

Examples showcasing Vulnerability

Three set of situations are mentioned below to understand vulnerability.

SITUATION 1 Economically weaker sections are forced to settle in areas which are least valued like flood plains, watersheds, right of ways and other hazardous areas. Such areas have low level of utility services and infrastructure management. As the poor do not have land title and they face threat of eviction, there is no incentive to invest on safe construction technology. In case of a hazardous event, these people are at high risk due to reasons like building collapse, health hazards and loss of assets. The poor people become the first ones to succumb to the situation.



Disasters are designed by conscious and unconscious human interventions adversarial to the course of ecology and the natural environment. It is exacerbated by reactive thinking, policy failures and institutional neglect. It is also designed by power relations in economic, social, cultural, and political relations that oppress and marginalize groups of people.



DENNIS MILETI, ED.,
'Disasters by Design', Washington D. C, 1999.

SITUATION 2 In the Gujarat cyclone of June 1998, some 3,000 people lost their lives, 200,000 houses were damaged, and the economy suffered losses of US \$ 700 million. However, there had been quite accurate identification and tracking of this storm for five days. The problem seems to have been that people were less familiar with such events and their preparedness also was insufficient. Laborers and isolated low-income workers like fishermen or salt pan workers did not receive or did not believe or even understand the warning (Kalsi and Gupta 2002).

WHAT ARE ASSETS?



Assets may be defined as the stock of wealth in a household, representing its gross wealth. Assets could be tangible or non-tangible.

Tangible assets comprise land, livestock, tools and equipment, reserves of food, jewelry, and education and skills.

Non-tangible assets refer to social networks and relations such as caste, occupational associations, trust and reciprocity, gender roles, etc.



SITUATION 3 *As a young and skilled entrepreneur, Khalid had set up a small tailoring shop near Ellis bridge, Ahmedabad with 6 workers under him. He had trained the workers and was earning a decent profit from this setup. In 2000, he faced a big loss as the area got flooded with water. There was a temporary halt in his work. He faced production loss and had to buy some machines from the savings he had. He could restart his work after normalcy but faced another setback in 2001, with the high impact earthquake causing cracks in the shop. This further drained his savings. But the final blow came when there were riots in 2002. He lost most of the trained workforce during the riots. His situation worsened with each event and has not been able to recover from the impact of the series of disasters. Presently he is still practicing as a tailor in a small shack, alone and with minimal resources. It might take him years to get back to the previous position. Khalid's coping capacity reduced and vulnerability increased with recurrent disasters.*

It can be seen through the above examples that **vulnerability is mainly due to lack of resources and information in society**. When a hazard strikes, people who are marginal and lack resources become more vulnerable. A vulnerable household may have a minimum level of well-being at a point in time, but it may fall below this level under the impact of a disaster or shock. Both poor and non poor households can be vulnerable depending upon the nature of risk. Vulnerability is thus linked with net assets, rather than income.

Factors Contributing to Vulnerability

Though interlinked, here we try to distinguish the factors which enhance vulnerability at macro (the global or national) and at the micro level (household or community).

AT THE MACRO (THE GLOBAL OR NATIONAL) LEVEL: The broad factors which contribute to vulnerability can be summarized as:

- Population growth,
- Rapid urbanization,
- Global economic pressures (e.g. inequalities, structural adjustment, debt burdens)
- Land and environmental degradation,
- Global environmental change,
- War and civil conflicts, etc.

AT THE MICRO (HOUSEHOLD AND COMMUNITY) LEVEL: The factors which directly affect vulnerability at household or community level can be summarized as:

- Gender,
- Caste
- Ethnicity
- Religion
- Disability (physical or mental)
- Age
- Economic instability
- Education and skills,
- Assets and savings,
- Lack of access to employment and credit
- Poor health and nutrition
- Substandard shelter and infrastructure,
- Settlement on marginal or dangerous lands, etc.

Principal Vulnerable Elements		
	TANGIBLES	INTANGIBLES
Floods	Everything located in flood plains or tsunami areas. Crops, livestock, machinery, equipments, infrastructure, weak buildings	Social cohesion, community structures, cohesion, cultural artifacts
Earthquakes	Weak buildings and their occupants, machinery and equipments, infrastructure, livestock, contents of weak buildings	Social cohesion, community structures, cohesion, cultural artifacts
Volcanic eruption	Anything close to volcano, crops, livestock, people, combustible roofs, water supply	Social cohesion, community structures, cohesion, cultural artifacts
Land instability	Anything located on or at base of steep slopes or cliff tops, roads and infrastructure, building on shallow foundations	Social cohesion, community structures, cohesion, cultural artifacts
Strong winds	Lightweight building and roofs, Fences trees, signs, boats fishing and coastal industries	Social cohesion, community structures, cohesion, cultural artifacts
Drought / desertification	Crops and livestock, Agricultural livelihoods, People's health	Destruction of populations, Destruction of the environment, Cultural losses
Technological disasters	Lives and health of those involved or in the vicinity buildings, equipment, infrastructure, crops and livestock	Destruction at the environment. Cultural losses, Possible population disruption

SOURCE: *Vulnerability and Risk Assessment Training Module, Disaster Management Training Programme, UNDP*

Analyzing the Root Causes of Vulnerability

As development practitioners, we often try to reason out what causes increase in vulnerability of an individual or a community? An answer to this might not be as direct and simple as it sounds. There are complex and interlinking processes which lead to vulnerability. One needs to untangle the vulnerability links and recognize the root causes of disaster risk. Many theories have been developed to understand the causes of vulnerability. Here we look at an analytical framework called 'Pressure and Release model' (developed by Blaikie et al, 1994, Wisner et al, 1993). Figure on the facing page shows how disasters are caused due to two opposing forces generated by progression of vulnerability on one hand and occurrence of hazard on the other side. Here, vulnerability is described in three levels: unsafe conditions, dynamic pressures and root causes.

ELEMENTS AT RISK

- People's lives, their health, economic activities, where and how they live, their jobs, equipment, crops and livestock.
 - Community infrastructure – water, electricity, communications, roads and Transportation.
 - Community services - schools, hospitals, and religious institutions.
 - Natural environment on which the society depends.
-

1 People are dependent on various resources like houses, water supplies, social groups and networks, crops, livestock, savings, jobs, natural environment, etc. These resources become at risk when a hazard strikes. If these resources are in unsafe condition, then people become vulnerable and a disaster is likely to happen when a hazard strikes. The unsafe conditions/ threats are specific to the location and social conditions.

For example unprotected buildings and infrastructure and lack of disaster preparedness create an unsafe condition and the people are likely to be affected when a hazard strikes.

ANALYSIS OF DYNAMIC PRESSURES

This will include analysis of:

- Organisations and Actors (State, Civil Society, Private Structures and Institutions)
Community / Household level
Municipal
National
Regional
International
 - Policies and Practices (Formal / Informal Processes)
Policies/ Frameworks/ Strategies
Legislation and Laws
Culture / Customs
Power Relations (i.e. age, gender, caste, class, ethnicity)
Vested Interests
-

2 The unsafe conditions are a result of bigger forces (dynamic pressures) acting around us. These are created by many processes like the laws, institutions, policies or activities being implemented around us. These forces are also dependent on the organizations/ people responsible for implementing like the government, private body or an individual. The forces often result in reduced access to resources for a community. We are often not aware of these forces but their combined effect results in increased vulnerability for an individual or a community.

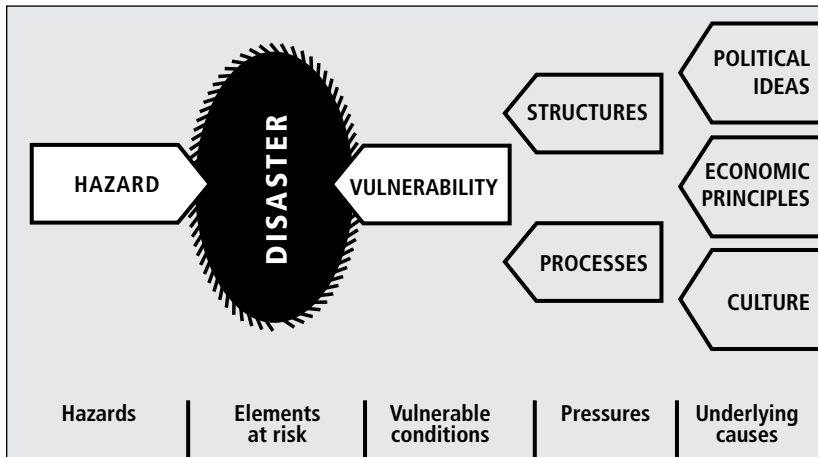
For example: unsafe buildings and infrastructure are due to pressures of poor implementation of building bye laws by the local authority or tenure issues created by the authority or an individual or low level of awareness in a community.

3 The cause of vulnerability can be much deep rooted and can originate from the economic, political or cultural scenario prevalent in the region. People in power behave in different ways depending on the economic, political and the cultural environment. These issues seem far away from the affected community but can have an overall powerful influence. People's vulnerability at local level is linked to the root causes like poor governance, greed, inequality or injustice.

For example: Low level of enforcement of building regulations can be due to poor governance and corruption prevalent in the organization. The negative forces like low level of enforcement lead to a vulnerable condition of sub-standard constructions and high rate of building failures.

Thus we see that there are a wide range of critical and inter-related factors that lead to vulnerability. Poverty, population increase, climate change, overdependence on natural resources, poor governance and inequitable markets are all factors that can enhance vulnerability.

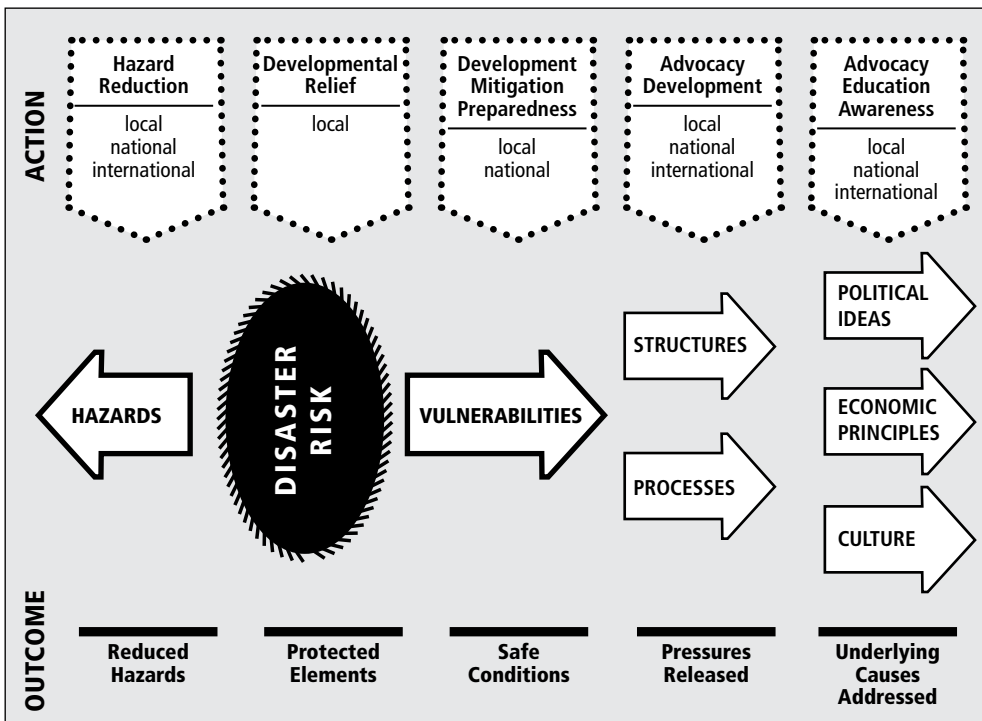
The Disaster Crunch Model



ANALYSIS OF UNDERLYING CAUSES

- **Social** - values and norms, customs & culture, religious beliefs, philosophies, rights and responsibilities, societal divisions linked to issues of inequality, greed, prejudices (e.g. class, caste, creed, ethnicity, gender)
- **Political** - ideologies, priorities, patronage
- **Economic** - terms of trade
- **Natural** - natural environmental condition

The Disaster Release Model



ADAPTED FROM:
Blaikie P, Canon T, Davis I and Wisner B (1994), At Risk: Natural Hazards, People's Vulnerability, and Disasters London, Routledge and Reducing Risk of Disaster In Our Communities by Tearfund, 2006

To understand the root causes of disasters, one needs to analyze the relationship existing between the economic, political, and cultural situation in the region. Here is root cause analysis of few situations described earlier.

SITUATION 1 Most of the people who settle down in slums and vacant areas in the city are migrants. Main reason of migration is lack of work opportunities or unemployment in rural areas. Most often they are landless and come to cities in search of livelihood. In absence of policies and programs in urban areas, the migrant laborers are forced to live as urban squatters and they settle in unsafe locations. Even a small event affects their survival.

When people move to cities and settle as squatters, they put their houses, livelihoods and assets at risk. They live in unsafe conditions in cities, which are created due to the fragile environment, unstable livelihood conditions or lack of disaster preparedness. A knee jerk reaction to deal with this would be to stop migration. But the pressure to migrate is created due to various other reasons like poor local markets and investments in their region. Even the caste system can be a dominant pressure in some cases to force people out of their region. So factors like land alienation, inappropriate productive skill, lack of local markets or forces like decreasing productivity of soil can create and sustain vulnerable conditions for the poor villagers. The political and economic system and even the belief and culture of the society (which discriminates among high and low castes, men and women, etc.) are the some of underlying/ root causes of migration.

SITUATION 2 In case of Khalid, the skilled entrepreneur, his productive tools, also referred here as the elements (like sewing machines, workforce, workshop, savings, etc) became at risk when there were hazards like the flood, earthquake and the riot. Due to his existing vulnerable conditions impacted by the location of his shop, unsafe building structure, insufficient assets, etc, the above elements were impacted and damaged. Khalid's vulnerability can be linked to macro causes like access to resources, poor governance, inappropriate risk transfer policies, etc. These may not seem to be directly linked to him at first instance but have a powerful influence on his life.

These simple cases highlight the complex inter-linkages of the economic, political and cultural causes which build pressure on communities and enhance their vulnerability. When a hazard strikes vulnerability tend to collapse the coping capacity of the individual leading to a disaster.

Understanding the Root Cause of Vulnerability

ELEMENTS AT RISK	VULNERABLE/ UNSAFE CONDITIONS	LIKELY CAUSES OF DYNAMIC PRESSURES	ROOT CAUSES
<ul style="list-style-type: none"> • People • Buildings and Structures • Infrastructure - water supply, transport network • Communication and electricity • Public health • Social groups and networks • Crops • Livestock • Savings • Job • Natural environment 	Economic <ul style="list-style-type: none"> • Insufficient assets • No economic diversification • No credit and saving facility • No insurance protection 	<ul style="list-style-type: none"> • Ineffective poverty alleviation programs and policies • Weak land reform policies • Lack of education and skills • Limited access to local markets • Decrease in productivity of soil 	<ul style="list-style-type: none"> • Poor governance • Corruption • Political violence • Low level of law and order • Absence of justice & conflict resolution mechanisms • conflict and civil unrest • Political, economic & social hierarchies • Political marginalization • Caste based discrimination • Racial/ religious discrimination • Gender inequality • Climate change • Poverty
	Physical <ul style="list-style-type: none"> • Unsuitable location of living (soft ground, along fault line, low lying areas) • Unsafe building / structure 	<ul style="list-style-type: none"> • Poor implementation of building bye laws, development plans and development control regulations • Deficient urban management practices • Non compliance of building codes • Unplanned development • Inappropriate construction practices • Limited access to early warnings • Lack of training and education • No insurance coverage 	
	Individual <ul style="list-style-type: none"> • Unsafe environment for women, mentally/ physically disabled, aged/ children • Poor health and hygienic conditions 	<ul style="list-style-type: none"> • Lack of education and health facilities • Low participation of women in decision making process • Poor infrastructure • Ineffective community organizations and social support mechanism 	

Vulnerability Reduction

The disaster Risk formula, $Risk = Hazard \times Vulnerability$ makes it clear that risk can be reduced by reducing the severity of hazard or by improving the protection of elements at risk. Some natural disasters like landslides, floods can be prevented by technical interventions like building retaining walls, improving slopes and drainage, etc. However, in case of natural disasters like earthquakes, cyclones, wind storms, etc, it is impossible to prevent the geological or metrological processes from occurring. In such cases, the focus of DRR is to reduce the vulnerability of elements which are likely to be affected.

The root cause analysis suggests that vulnerability can be deep rooted with multiple processes linking the root causes to the local unsafe conditions. It suggests that **to reduce risk, we need to work against the very factors that caused the pressure.** This is the basis of the **disaster risk reduction concept.** As a long term strategy for vulnerability reduction

we need to work against the pressures and tackle the root causes. It can be analyzed from past experiences that often we deal with the immediate cause without considering the root causes. A response based approach would only try to find quick solution to the problems created by a disaster. Over dependence of communities on response mechanisms results in a continuous cycle of relief and vulnerability while the root causes continue to grow beyond manageable limits.

Initially, addressing vulnerability can appear to be a complex and a gigantic task, similar to the idea of analyzing an elephant by blindfolded men. However, if vulnerability is targeted from the initial stage with a multi-sectoral and a participatory approach, specific context related solutions will appear. It can be seen that the root causes of vulnerability are also factors of underdevelopment. Thus promoting development programs in vulnerable areas helps to target vulnerability.

People need to identify the risks and the vulnerabilities they face so that they can frame out the actions they need to undertake. People can reduce vulnerability by their own actions like reaching cyclone shelter in time or homestead raising, etc. or they can take up advocacy work and force the local authorities to perform better. It is thus important for communities and individuals to enhance knowledge about the vulnerabilities they face.

In the Chars area of Bangladesh, which suffers from regular riverine flooding, recent programmes have focused on providing livelihood options that can function even during flooded periods. Households have been encouraged to construct fenced-in plots which allow for fish-farming during the flood season, which can last up to three months of the year, and produce fish to supplement diet and to sell.

SOURCE:

Reducing the Risk of Disasters – Helping to Achieve Sustainable Poverty Reduction in a Vulnerable World: A DFID policy paper.

For example, rainwater harvesting can be used for drinking and perennial crop cultivation, as well as livestock management. This has been successfully used to mitigate over-exploitation of water resources and drought in parts of Ethiopia.

Do poor suffer more in disasters?

Every poor may not suffer in disasters nor is it only the poor who suffer. **Poverty is only one of the several dimensions of vulnerability.** There are also other dimensions such as class, ethnicity, community structure, community decision making processes and political issues that determine poor people's vulnerability. A poor community may be economically vulnerable but at the same time may have social, cultural and political capacities to cope with disasters, which can be effectively utilized in designing risk reduction programmes for the poor.

ADAPTED FROM:

background paper on Mainstreaming Disaster Risk Reduction in Poverty Alleviation, 2nd Asian Ministerial Conference on Disaster Risk Reduction.

Who are Vulnerable?

CASE OF AMARDI VILLAGE, KUTCH, GUJARAT

There exists a typical trend of community specific vulnerability in the village. Kolis and Bawas are economically most vulnerable in the village. Decreased livelihood opportunities in the past 5 years have forced them to resort to optional livelihood in the near by areas as and when available. There is no sustainable means of livelihood for this community. They also lack support from external sources for out migration, which have forced them to resort to daily labour work. Certain Muslims and Ahirs also face similar situation, but they have either institutional support of the community in case of crisis.

Patels and Sathwaras are large land holding castes. They have their own family business in the village or in major towns nearby or at Mumbai. However currently, most of the elderly have remained in the village. Due to out migration of most of the youth in these

communities, the elderly have been left without any social support. However, there is a strong caste based association which responds at the time of crisis.

Drought is a regular feature in this area. Drought can lead to serious drinking water problems in the village. Patels and Sathwaras have private bore wells, which is a source of drinking water to the entire village during drought. However other communities face drinking water shortage during such crisis. Reduced irrigation water supply due to lowering groundwater level, land salinity and irregular electric supply adversely affects the agriculture productivity even in normal situations.

The villagers perceive vulnerability in terms of individual household conditions. Listed below are the community criteria of vulnerability.

LIST OF VULNERABLES IN AMARDI VILLAGE

NAME	FALIA	CASTE	WHY VULNERABLE
Kheta Dhayabhai	Harijan vaas	Harijan	Widow with family responsibility
Bhika Veerabhai	Harijan vaas	Harijan	Single
Tejiben Velabhai Jadav			Paraplegic woman
Arjun Valabhai	Ahir	Koli	Single without support
Anda Bhurabahi Kothi		Patel	TB patient
Jiviben Punjabahi		Patel	Widow without support
Namaben Gangabhai			Poor
Jamalbhai		Muslim	TB patient
Ramubhai Garacia		Garacia	Do not have resources
Ramiben Andabhai	Patel	Patel	Widow with mentally challenged son
Ambhavbhai Harjibhai	Patel	Patel	Marginal land holder with family responsibility
Dhaniben Ukhabhai Nor	Patel	Patel	Widow with young unmarried daughter
Dhaiben Umar	Muslim	Muslim	Poor
Ganeshabhai Patel	Patel	Patel	Aged couple

Disaster Risk Reduction

Disaster Risk Reduction (DRR) encompasses activities which help to reduce vulnerability of individuals/communities and to build their resilience or capacity to withstand disasters. Disaster risk reduction (DRR) concept aims to build resilient individuals, family, community, society and nations. It helps to make communities and individuals aware of their risk to hazards and how they can reduce their vulnerability.

DRR includes all measures undertaken to ensure the readiness and ability of a society to forecast and take precautionary measures in advance of imminent threat, and respond and cope with the effects of a disaster by organizing and delivering timely and effective rescue, relief and other post-disaster assistance. DRR also includes measures that can be undertaken to minimize the destructive and disruptive effects of hazards and thus lessen the magnitude of a disaster.

Stakeholders in DRR

DRR deals with multidisciplinary aspects. Thus no single actor can achieve the inputs required to achieve DRR. It has to be a team effort with various actors involved from the national to the state to the local level. Government, panchayati raj institutions, community based organizations, civil defense, home guards, students, professionals, local NGO's, religious organizations and local media all have an important role to play in DRR.



Disaster risk reduction (DRR) is the conceptual framework of elements considered with the purpose of minimizing vulnerabilities and disaster risks throughout a society in order to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, and facilitate sustainable development.



DRR is a cross-cutting and development issue. The process of DRR is a complex one consisting of political, technical, participatory and resource mobilization components. Therefore, DRR requires collective wisdom and efforts from national policy and decision makers from various government sectors, and representatives from civil society, including academic institutions, the private sector and the media.



UNISDR, Guidelines, National Platforms for Disaster Risk Reduction

Disaster Risk Reduction Measures



RISK ASSESSMENT

To reduce risk, first of all one needs to identify and analyze the nature and extent of risk in the region. The decision makers and the community should understand the potential effects of a hazard in the area and the magnitude of future risks. This can be achieved by Risk Assessment. It includes hazard analysis and vulnerability/ capacity analysis, risk identification and analysis.

HAZARD(S) ASSESSMENT is a multi-disciplinary task and requires inputs from different specialized organizations. It includes

- Identification of past, present and future hazard(s)
- Determine the nature and behavior of the hazard(s)

What can we achieve by hazard assessment?

The exercise helps in deciding preventive measures to minimize hazard like floods, fire, chemical explosion, drought, desertification, etc.

SOME TOOLS FOR HAZARD ASSESSMENT:

- Hazard Map
- Historical Profile
- Seasonal Calendar
- Hazard Assessment Matrix

SOME TOOLS FOR VULNERABILITY ASSESSMENT:

- Hazard Vulnerability Map
- Community watching or transect walk
- Seasonal Calendar
- Livelihood Analysis
- Institutional / Social network analysis
- Semi-structured interviews and focused group discussions
- Ranking
- Problem Tree
- Disaster Crunch Model

SOURCE:

Integrating Disaster Risk Management in Local Governance; Facilitators' Guide and Sourcebook; Barangay Disaster Management Training Workshop, UNDP, 2006.

Tools for conducting hazard assessment

tools which can be used for hazard analysis, describing the probability and the likely impact of hazards in a certain area include hazard matrix on the nature and behavior of hazards, hazard map, hazard scenario modeling, seasonal calendar, historical profile or time line.

VULNERABILITY AND CAPACITY ANALYSIS (VCA):

Vulnerability Assessment helps to identify the factors that create unsafe conditions for the communities. It helps to analyze the immediate and root causes which lead to the unsafe conditions. Vulnerability analysis requires study of social, cultural, economic and political aspects of the local communities.

Capacities Assessment helps to identify people's strengths (means, assets and resources) used to counter the unsafe conditions and meet basic needs (resilience).

What can we achieve by VCA?

This helps to show how people and infrastructure is likely to be affected by a hazard event. Based on this specific development, preparedness or mitigation measures can be adopted to achieve safe conditions.

Tools

Tools for vulnerability assessment include the vulnerability map (hazard map showing elements at risk), transect, seasonal calendar, historical

profile, time line, institutional and social network analysis, PRA technique (at community level). Advocacy, education, awareness and development measures will help to target the root causes.

Vulnerability Atlas of India, Seismic Zone Map of India, micro-zonation maps, Geographical Information System (GIS) tools can be used for assessment.

AWARENESS BUILDING AND KNOWLEDGE DEVELOPMENT

Public education, awareness, training and research on disaster risk reduction are essential for building a 'culture of safety and preparedness'. The planning process will only be effective if the people know what to do in times of disasters and know what to expect. Thus education of those who may be threatened by disaster is essential.

Awareness Building

Creating awareness about the hazards and the risks should start from the community level. For example, public education in schools for children should have a standardized curricula and information about actions to be taken in case of a disaster threat or occurrence. Occupants of large buildings and schools need to rehearse what they should do in the event of fire, earthquake or other hazards. There should be training courses for an adult population and community members.

Public Information

There should be widespread information on hazard safety through newspapers, TVs, journals and other communication mediums.

DRR measures also include:

- Capacity building (at the community level) such as developing a disaster preparedness committee
- Sensitization of populations at risk.
- Early warning systems

POLICY AND PLANNING MEASURES

These help to integrate DRR in the policy and planning framework.

Examples are:

- Institutional development, policy formulation and good governance
- Planning measures like mapping, land use planning, effective building codes, better evacuation plans, environmental management plans, etc.

The Disaster Management Act, 2005 mandates preparation of District, State and National level plans. For more details, please refer to chapter on 'DRR: Policy, Environment and Local Action' on page 68.

SOME TOOLS FOR CAPACITY ASSESSMENT:

- Resources Map
 - Historical Profile
 - Seasonal Calendar
 - Gendered Resources Mapping
 - Livelihood / Coping analysis
 - Semi-structured interviews and focused group discussions
 - Institutional and Social Networking
 - Community Drama
-

SOURCE:

Integrating Disaster Risk Management in Local Governance; Facilitators' Guide and Sourcebook; Barangay Disaster Management Training Workshop, UNDP, 2006.

TOOLS FOR DRR:

Regulatory / Statutory

- Development plans/ Zoning
- Development Control regulations
- Land acquisition/ town planning schemes.

Non-regulatory / Non-statutory

- Limiting public investment in hazardous areas
 - Relocation out of hazardous areas
 - Increasing public awareness of hazards
 - Preservation of natural functions
 - Retrofitting
 - Warning and preparedness
 - Insurance
-

ECONOMIC MEASURES

Equitable economic development is the key to risk reduction. Risk transfer measures help to share risks from an individual to a larger collective group. Insurance is a major economic protection device. For low-income households in developing countries is often called micro-insurance. Other arrangements like community pools, social protection funds or weather indices are used for managing financial impact of disasters. If the risk of economic loss is spread widely over a large number of premium payers, the loss is safely dissipated.

PHYSICAL MEASURES

Physical measures are designed to reduce the vulnerability and exposure of infrastructure to natural hazards. Different disasters require different physical measures. For example, flood mitigation requires measures like training the rivers, building embankments, raising level of habitations etc. Earthquake mitigation requires construction of disaster resistant structures, retrofitting of buildings and relocation of habitations. Cyclone mitigation requires construction of embankments, strengthening of buildings, construction of shelters etc.

Measures for DRR

Risk Reduction initiatives include measures to avoid (prevention), limit (mitigation) or take precautions against (preparedness) the destructive and disruptive effects of hazards and also to respond or cope with the effects of a disaster.

PREVENTION AND MITIGATION MEASURES

PHYSICAL OR STRUCTURAL MEASURES:

Structural measures are mainly engineering solutions to prevent disasters. These include:

- Retrofitting of existing structures
- Use of appropriate building standards
- Reducing hazard proneness of site (construction of dams, windbreaks, earthquake resistant construction, diversion channels, flood protection walls, sea walls, cyclone shelters, shelter belt plantations and regeneration of mangrove belts in coastal areas etc.

NON-STRUCTURAL MEASURES:

These measures are in the form of capacity building and improved livelihood practices. They discourage location of settlements, infrastructure and economic activities in known hazardous areas through:

- Land-use regulations
- Financial incentives or penalties
- Disclosure of risk information
- Public infrastructure policy
- Natural resource management

Non structural measures also include:

- Afforestation, scientific watershed management, vegetative bunds, improved agricultural practices and relocation of habitations.
- Community health and sanitation (improving nutrition, keeping the community clean, immunization, herbal gardens, training of community health workers)
- Strengthening livelihood and economic activities (sustainable agriculture, income generating projects, handicrafts, marketing cooperatives)

FINANCIAL AND RISK TRANSFER MEASURES:

These include measures like Savings, Insurance schemes, micro insurance, index based insurance, catastrophe pools and bonds, risk financing, etc.

PREPAREDNESS MEASURES

PUBLIC AWARENESS ACTIVITIES:

- Public awareness campaigns such as community meetings and house-to-house information dissemination, posters and pamphlets, poster-making contest for school children, disaster consciousness day/week/month
- Disaster preparedness training

PLANNING:

- Formulation of community disaster management plans

CAPACITY BUILDING

- Formation and strengthening of community disaster management organization

REHEARSALS

- Evacuation drills and disaster simulation exercises

INSTITUTIONAL FRAMEWORK

- Strengthening coordination, networking and institutional arrangements

COMMUNITY EARLY WARNING SYSTEM

- Training to use HAM radios, linking weather forecasting and ICT measures, etc.

RESPONSE MECHANISMS

- Ensuring availability of relief supplies (stockpile) and logistics
- Evacuation and evacuation centre management
- Search and rescue
- First aid and medical assistance
- Damage Needs Capacity Assessment
- Relief delivery (food and drinking water, clothing, blankets, kitchen utensils, etc.)
- Psycho-social counseling (comforting, prayers, critical stress debriefing)
- Repair of critical facilities and services
- Emergency Operations Centre (for major disasters)

EVACUATION

RECOVERY, REHABILITATION AND RECONSTRUCTION

- Cleaning-up the debris
- Rebuilding and strengthening of damaged structures
- Relocation to safe place
- Income-generating projects
- Integrating Disaster Risk Management in Local Governance.

Good Practices in DRR

EARLY WARNING AND PUBLIC AWARENESS

Coastal communities in Andhra Pradesh are vulnerable to cyclones and storm systems. Ham-radio sets have not always been a reliable form of communication for early warnings. As part of a European Community Humanitarian Aid Department (ECHO)-funded disaster preparedness programme started in 2001, mobile phones were distributed to 120 villages along a stretch of coastline in Andhra Pradesh. The phones are programmed to have restricted dialing and are distributed twice a year prior to the main cyclone season to disaster management committees. This phone system has proven to be more reliable, both for receiving warnings from outside the area, and also to pass on messages to neighboring villages about impending events.

RISK SHARING/TRANSFER

The ProVention Consortium highlights micro-insurance initiatives for sudden-onset disaster risks, which are offered by NGOs in conjunction with insurance companies in two states. These schemes build on micro-insurance arrangements for independent risks, such as unemployment, fire, and accidents by extending cover to loss of life, property or livestock due to natural disaster events. Coverage for property losses due to floods, earthquakes, cyclones and other natural disasters is offered to groups such as women with a minimum group size of 250, or to community groups for managing the impacts of disasters post-event. Furthermore, clients can engage in risk reduction training for a small fee.

EFFECTIVE RESPONSE AND PREPAREDNESS

The 1999 cyclone in Orissa and floods in 1998 have shaped the direction of the Indian Red Cross. When a disaster strikes, pre-planned relief operations are set in motion with state and district branches supporting the rapid assessment of needs and dispatching materials from stockpiles around the region in addition to medical teams, financial resources and trained relief volunteers. Almost two million volunteers are trained in first aid to help in an emergency. Communities particularly at risk are people in low-lying areas near rivers that flood annually, and those living on the cyclone-prone east coast, the high activity seismic zones and areas prone to drought. With greater awareness of how to reduce risks and develop coping strategies, these communities can take a more proactive role in deciding their own risk management programs.

SOURCE:

Reducing the Risk of Disasters – Helping to Achieve Sustainable Poverty Reduction in a Vulnerable World: A Policy Paper by DFID

RISK AWARENESS AND REDUCTION INITIATIVES IN GUJARAT

In Gujarat, the Gujarat School Safety Initiative by GSDMA and SEEDS and the GoI-UNDP Disaster Risk Management Programme has created the right environment for undertaking innovative Disaster education initiatives at the school level. Disaster Management has been integrated into Civil Engineering and other training curricula along with training and education of School Communities. The schools hold Science fairs on disaster management across state.

RISK REDUCTION PROGRAMMES BY ENGINEERING COLLEGES

Engineering colleges in Gujarat are promoting research on earthquake engineering. All the 15 Government engineering colleges are making efforts to create their own earthquake engineering laboratory to promote the subject. Students have designed different earthquake resistant building models. Professors of different engineering colleges have undergone training and are now ready to train professors of other colleges.

PRIVATE SECTOR INITIATIVES IN DISASTER RISK REDUCTION

Industrial Associations, Chamber of Indian Industries and Mutual Aid Schemes are playing a proactive role in risk reduction awareness and education in the state. Disaster Prevention and Management Centre, Ankleswar, runs the mutual aid scheme in Bharuch Ankleswar area, Jamnagar Mutual aid scheme, Hazira (Surat) and Vadodara Mutual aid schemes with a large membership following promoting awareness.

PUBLIC SECTOR INITIATIVES IN DISASTER AWARENESS

In Gujarat, public sector industries are promoting hazard awareness education in villages and schools in their jurisdiction through village Panchayats. They have developed IEC materials on various industrial fire and chemical leakage and are conducting regular awareness programmes through their industrial and fire safety units. Regular on-site drill and off-site emergency drills involving the vulnerable villages every quarter.

SOURCE:
*Solution Exchange for the Disaster
Management Community by UNDP*

OTHER EXAMPLES:

Microfinance services to the poor by SEWA.

92 per cent of all workers in India are in the unorganized sector. SEWA (Self Employed Women's Association) a trade union focuses on urban poor and rural women working in the unorganized sector to organize them. It has designed microfinance services specially to target these women through the Swashrayi Mahila SEWA Sahakari Bank Ltd. in Ahmedabad. It also provides insurance services with special packages to insure family members, work related assets etc at affordable premium rates. Its services are decentralized by outreach centers and 'Banksaathi'-'Handholders' in rural areas. The main strength of SEWA services is its doorstep approach through strong women's network, which enables the reach of all these services in rural remote areas.

CBDP in Andhra Pradesh.

In Andhra Pradesh State when initiating the CBDP programmes, efforts were made to ensure that the programmes were led and controlled by women from the communities involved. Emphasis was also laid on utilizing local resources and reducing dependency on outside support. In some cases, special training was given to women on disaster issues. For instance, in a recent flood in Andhra Pradesh State, communities played a major role in the rescue programme, paying special attention to children, pregnant women, old people and the disabled. In some villages in this state, communities have created village emergency funds based on household 'handful-of-rice' and 'kitchen-utensil' contributions.

Task Force Committee in Kerala.

In Alleppey District (Kerala State), women comprise 50 per cent of task force committee members, 50 per cent of village-level disaster management teams, and 70 per cent of both central-level resource teams and central-level trauma counselling teams. More priority was given to widows and 'weaker' women when selecting the beneficiaries of the housing program. In Thiruvananthapuram District (Kerala State), village communities have taken initiatives to convert waste, which was a breeding ground for mosquitoes and diseases, into vermin compost. This helped address the chikungunya menace in the area.

SOURCE:

Gender Perspective: Working Together for Disaster Risk Reduction, Good Practices and Lessons Learned Geneva, June 2007

INVOLVING SCHOOL CHILDREN AND EX-SERVICE MEN FOR DISASTER PREPAREDNESS

As part of Community Based Disaster Preparedness (CBDP) initiative in the coastal districts of Andra Pradesh by Oxfam GB, school children and ex-servicemen were involved in disaster preparedness training. School is the place where children from different villages interact. Children are fast learners and they don't keep the knowledge with themselves. Oxfam initiated disaster preparedness training for more than 2000 school children using wide varieties of games and simulation exercises. Oxfam collaborated with the fire services to organise training for school children on fire fighting. After this training, the children can save themselves in disaster situations, can help others, will grow up with this capacity and will contribute to creating a culture of disaster preparedness. Similarly, Oxfam prepared a list of 500 ex-servicemen in the program villages, enrolled them as volunteers and oriented them for disaster response.

COMMUNITY INVOLVEMENT IN EARTHQUAKE RISK REDUCTION IN PATANKA VILLAGE (SEEDS, 2002)

Patanka Village was among the worst hit but least served villages following the Gujarat earthquake on January 26, 2001. Applying lessons from previous earthquake rehabilitation projects, SEEDS together with like-minded organizations decided to undertake a model village rehabilitation and mitigation project in Patanka. At the onset, a community workshop was convened for ideas exchange on how the community and outside organizations could work together and demonstration through construction of a prototype on earthquake resistant technology.

Intensive capacity building exercises strengthened people's knowledge about the risks they faced. Shake table demonstration tests helped in building their confidence in the safety of earthquake resistant structures. Community leaders were involved in the risk assessments. As part of the training of the local masons, trained masons from Nepal from the KVERMP stayed for 3 months in Patanka. Subsequently, all construction was finally taken up by the house owners themselves. The community had a tremendous sense of ownership of the project. Because all family members were involved, all houses were reconstructed in record time. Cost of the house is half when compared to other rehabilitation interventions made when the external agency did everything, leaving very little scope for the villagers.

Other examples of non-structural mitigation solutions coming from communities in South Asia and the Philippines includes savings and credit programs, primary health care systems, food security program including sustainable agriculture, and advocacy to pressure government for more responsive policies.

CASE OF AMARDI VILLAGE, KUTCH, GUJARAT

Action Points for Drought Proofing in Amardi village. (facilitated by UNNATI)

Amardi village is located 12 km North to Bhachau on Dudhai - Bhachau road in Kutch district. Small and marginal farmers and the poor are the most vulnerable from drought. Water scarcity, both drinking and domestic, affects the health severely. Women and children are the most vulnerable for health hazards and malnutrition.

Creation of fodder bank and seed bank within the village will largely help the villagers to sustain their live stocks in stressful conditions of drought and reduce burden of financial loss in case of crop failure. Crop failure, depleting ground water levels, saline ingress from the sea and lack of moisture content in the soil affects the productivity of the land and results in great financial loss for the farmers. Agriculture insurance is of paramount importance in this region.

Also a better and subsidized credit facilities will help the poor farmers in reducing their financial stresses. It will also put a check in exploitation by money lenders and debt traps. Insurance cover for livestock will also help poor villagers to cope up with their losses due to death of their cattle.

DRR PLAN OF AMARDI VILLAGE

Action	Proposed Activities	Target Population	Responsible Agency
Revival of village pond across highway and near kolivaas	Survey, remedial measures to strengthen the bund, excavation for deepening pond, clean up of bushes and baval	All villagers	NGO, WASMO, Panchayat, CBO
Agriculture Insurance	Linking up with Insurance Companies, Mass Insurance scheme	All families, Marginal & small farmers	Insurance company, Panchayat, NGO
Livestock Insurance	Linking up with Insurance Companies, Mass Insurance scheme	All families, esp. families depended on livestock	Insurance company, Panchayat, NGO
Watershed/ water harvesting	Check dams, reviving village water resources, water harvesting structures, formation of Paani Samiti, Generating Awareness	All families, especially vulnerables	Govt, Panchayat, NGO, corporates
Gochar development	Identifying and developing Gochar, training for operating and maintaining it	All families	Panchayat, VDC
Irrigation technology transfer	Trainings and awareness programmes, linking with GAU	All families, especially vulnerables	GAU, Panchayat
Seed bank	Formation of seed bank committee under VDC, training to operate seed bank	All families, especially vulnerables	VDC, seed bank committee
Fodder bank	Formation of fodder bank committee under VDC, training to operate fodder bank	All families, especially vulnerables	VDC, seed bank committee
Credit & SHG creation	Formation of SHGs and training to operate it	All families, especially vulnerables	Women SHGs, Panchayat, NGO, rural banks
Non farm activities promotion	Identification, promotion and market linkages to Non farm based activities	Potential skilled, unemployed,	NGO, CBOs
Vocational trainings	Vocation and technical training to skilled youths	Youths, women	Potential skilled, unemployed, youths
Food and nutrition security	Trainings and awareness generation among people and staff of CHC and Anganwadi on nutrition, monitoring food and nutrition	Women and children	Vulnerables, daily wagers, poor especially women & children
Strengthening PDS	Constant monitoring, grievance redressal system for PDS	PDS shop owner, BPL and vulnerables	PDS shop owners, monitoring committee

Vulnerability Analysis and Structural Audit of Post-Earthquake Reconstruction of Shelters at Vondh village by CFID and UNNATI,
July 2004

Vondh is a large village along National Highway 8A, 7 km from Bhachau on the way to Samakhyali. Out of approximately 1800 families, nearly 840 families (47 per cent) opted for relocation, while rest of them opted for owner driven process of the Government. There were large number of houses built without guidance and inspection by engineers or any other agency. This situation demands for structural audit of shelters in this village.

A multiphase programme was formulated which will ultimately lead to assistance in retrofitting the houses of vulnerable groups and generate mass awareness for importance of retrofitting in the village. UNNATI carried out a rapport building programme before going for actual house hold survey. After the initial rapport building, PRA was conducted to get an insight on the issues.

In the household survey, a total of 238 households were surveyed for understanding socio-economic condition, vulnerability and structural condition of house. The survey team comprised of professionals from social as well as engineering background.

Most critical parameters to assess safety of structures are disaster resistant elements incorporated in reconstruction. Ranking system was used for categorization of weak structures. Each critical parameter was ranked (with one point) and sum of the points indicated relative stability of the structures—i.e. more the points, more safe are the structures. Negative point was assigned to structures, which lacked some critical features.

Identified critical indicators were (positive points):

- Disaster resistant features in masonry
- Disaster resistant features in roof
- Presence of Plinth, Sill, Lintel and Gable bands
- Corner vertical reinforcements
- Vertical reinforcement surrounding openings
- Concrete roof structures

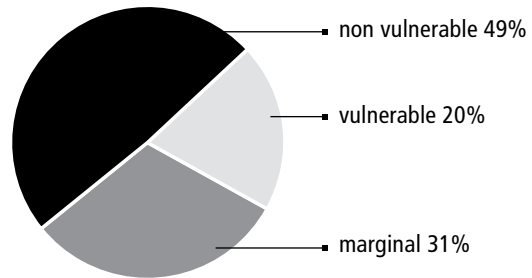
Negative points were given for absence of corner strengthening and improper joints of corner and huge openings at corner.

Houses with less than or equal to 6 points are considered as weak structures. Survey showed that 47 per cent (109) of houses gained more than 6 points indicating that they were safe structures. 26 per cent (61) of houses ranged between 4-6 points, which means there is scope of retrofitting some elements of structures. Whereas, 27 per cent (63) fall below 4 points. These are the houses that can be targeted first for retrofitting.

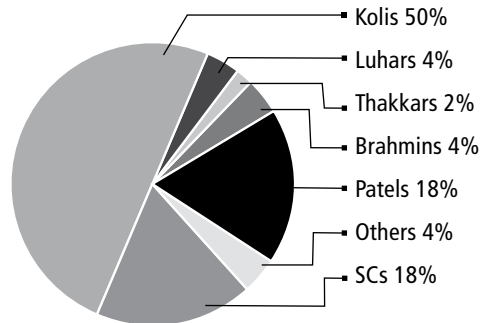
A combination of socio economic vulnerability and structural vulnerability is considered for identification of potential beneficiaries of the programme. The list of probable target group is derived by considering the weakest of both parameters.

Category	Indicators
(A) NON VULNERABLE	<ul style="list-style-type: none"> • Irrigated land • Non irrigated more than 25 acres of land • Strong Mumbai Links • Concrete slab, toilet, water supply, luxury items • Sustainable income • Multiple earners in family • Shared cropping
(B) MARGINAL OR AVERAGE	<ul style="list-style-type: none"> • Sustained income • Mumbai links • Comfortable house with basic facilities • Social support of community • Land holding between 5-15 acres • Middle income group • No luxuries • Marginal land • Physically or mentally challenged having social support
(C) MOST VULNERABLE	<ul style="list-style-type: none"> • Widow and women headed family without social support • Mentally / physically challenged without social support • Unsustained income / single earner • Limited basic amenities • Low caste / Low level occupation • Less or no social support

Socio Economic Vulnerability



Caste wise Vulnerables



DRR with the Community

From learning about the concept of disaster, vulnerability and disaster risk reduction, here we move to the next important part which defines the role of communities in achieving disaster risk reduction. There are various actors involved from the National to the State to the local level working on different aspects of DRR. It is seen in many cases that risks can be best managed at the local level. Also interventions are successful and sustainable when it involves direct participation of the people. Thus community can be considered as the building block for achieving disaster risk reduction.

What is a Community?

Community can be distinguished by groups of people, who are:

- Living within a specific geographical area or locality and exposed to common risks and hazards
- Experiencing similar disaster exposure or having been affected by a disaster
- Sharing common interests, traditions, resources or environment

When defining community, attention should be made to understand diversity and exclusion within a community. For example a community identified on the basis of geographical area will include a small village, hamlet, ward in a municipality, society or a neighborhood in a town.

However, in urban areas, communities are diverse. A geographical area can have people with diverse social and cultural groups. Usually geographical or administrative boundaries may separate urban communities. Segregation of communities is mainly on economic affordability of houses or land in that area.

Why do communities need to be prepared?

Communities need to be prepared and work together for DRR as:

- they are the first responders in a disaster situation.
- they have local knowledge to deal with the situation. People can be sources of useful ideas, such as those from indigenous technical knowledge and skills
- community participation helps to build their confidence, skills and ability to cooperate.

In case of Surat Floods of 2006, communities living on the banks of the river were unprepared as they did not receive information and warning signals about the rising water level in River Tapi. They neither had alternative arrangement nor evacuation mechanism or rescue plans. This resulted in massive damage to life and property.

DEFINITION OF PARTICIPATION



A process through which stakeholders influence and share control over development initiatives, decisions and resources which affect them.



World Bank, 1990

WHAT IS SOCIAL CAPITAL?



...the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions.

World Bank (2000)
www.worldbank.org/povertyhem.



...the rules, norms, obligations, reciprocity and trust embedded in social relations, social structures and society's institutional arrangements which enable members to achieve their individual and community objectives.

Narayan (1997) Voices of the Poor: Poverty and Social Capital in Tanzania, World Bank, Washington D.C., USA.



Community Participation

What is community participation?

Community Participation is the way in which each member in a group or community takes part in decision making and implementation of a development activity, for example women empowerment, livelihood programs, total sanitation, education, disaster management, governance, disaster management etc. They work together as a group to achieve common goals for the development of the community and individuals.

OBJECTIVES OF COMMUNITY PARTICIPATION

- To reduce vulnerabilities and strengthen people's coping capacity
- To increase the resources required for DRR
- To create ownership feeling amongst the communities
- To achieve sustainability of the program
- To reduce community's dependence on external assistance

EXAMPLE: Post earthquake of 2001 in Kutch, Gujarat, the field survey and interviews with the stakeholders indicate that Soni has been the fastest recovering community in Bhuj city, in spite of their lower income level, compared to other groups after the earthquake. The questionnaire survey suggests that speedy recovery and satisfaction rate for the construction plan of Soni is attributed to its social capital.

STAKEHOLDERS IN COMMUNITY PARTICIPATION

Stakeholders constituting of individuals and groups of people with a leader, NGOs, representatives from local administration, local business sectors and local academic institutions should work together as a community. Specific stakeholders who should be included in community based disaster management initiatives can include the following:

- Elected representatives - MPs, MLAs and members of local bodies like Panchayats and municipalities, local bodies.
- NGOs, charitable institutions and trusts, activists and credible opinion leaders in district, Block and Village settings.
- Self help groups particularly of women, groups of farmers and agricultural labourers, cooperative society members, youth clubs, Mahila Mandals, teachers associations, particularly at the primary level, ex-servicemen.
- Government representatives at local levels particularly those at block and village levels who can strike a rapport with the community because of their positioning such as the village level workers, revenue functionaries like lekhpals and patwaris, panchayat functionaries, health workers, ICDS workers, etc.
- Corporate sector.
- Volunteers, youth leaders like NCC, NSS, etc.
- Military and Para-military forces.

APPROACHES TO COMMUNITY PARTICIPATION

Community participation can be:

- **DIRECT APPROACH** – Direct approaches are one to one counseling or group meeting, call for community meetings, workshops, seminars, drills, mock rescue demonstration, lecture sessions, direct first aid and precautionary hints sessions, Group discussion.
- **INDIRECT APPROACH** – Indirect approach can be through call for co-operation through print advertisements, hoardings, posters, cable network announcements, warning notes, do's and don'ts brochures, listing and distribution of safety kits.

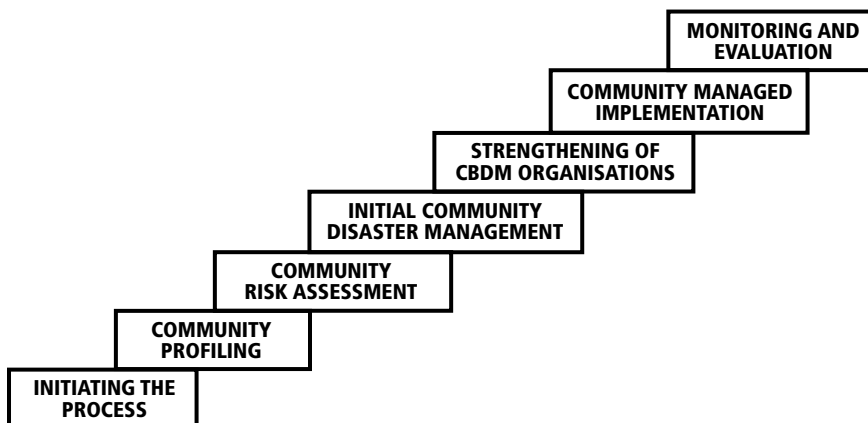
MEDIUM FOR COMMUNITY PARTICIPATION

Community participation can be encouraged through many platforms and mediums such as,

- Residential associations
- Social clubs
- Local schools and college activities
- Volunteers
- Self help groups
- Youth clubs
- Associations (in both urban and rural areas)
- Municipal corporation/ Panchayat meetings

PROCESS FOR COMMUNITY PARTICIPATION

Steps in the CBDRM process - transforming vulnerable communities to disaster-resilient communities



SOURCE:

Lorna P. Victoria, Community Based Approaches to Disaster Mitigation

KEY FEATURES OF CBDP PROGRAM CONDUCTED IN ORISSA

- Training of Trainers and Orientation on Block & Panchayat Disaster Management Plans.
- Formation of Block and Gram Panchayat Disaster Management Committees, Working Plans, Training of Task Forces.
- Selection and training of Volunteers from each village in CBDP & Mitigation and Community Contingency Planning (preparedness and mitigation measures).
- Formation & Training of Village Response Groups / Task Forces.
- Finalization & Approval of the GP and Block Disaster Management Plans.
- Mock Drills, Plan Implementation and Social Mobilization at various Levels.

SOURCE:

Impact Assessment Study of the Pilot Orissa Disaster Management Project, Report by Lorna P. Victoria on behalf of the Asian Disaster Preparedness Centre

Although steps may vary from community contexts and organizational mandates, the process and requisites for disaster risk reduction can be generalized as follows:

➤ **Initiating the Process**

- Develop an understanding of the disaster risk in the local context
- Build linkages and rapport with the community
- Define the project's objectives and outcomes
- Seek community leaders to support the project
- Build an inter-disciplinary group of experts to help with the implementation

➤ **Community Risk Assessment**

- participatory assessment of hazards,
- vulnerability assessment
- Resources Mapping Discussion
- capacities and people's perception of risks

➤ **Formulation of Initial Disaster Risk Reduction Plan**

- Identification of appropriate mitigation and preparedness measures including public awareness,
- training and education

➤ **Formation of Community Task Forces/ Committees**

- Community organizing and mobilization
- capability building and preparedness

➤ **Implementation of Risk Reduction Measures, activities, projects and programs**

- Implementation strategies and mechanisms
- Organizational/ institutional strengthening

➤ **Monitoring and Evaluation**

- Continuous improvement of disaster risk reduction plan
- Documentation and dissemination of good practices for replication

Community participation can be sustained if the risk reduction project responds to the immediate needs and priorities of the communities and they are involved in the study and decision process to identify relevant, realistic and do-able solutions.

CBDP PROGRAM INITIATED BY OXFAM GB IN ANDHRA PRADESH

Based on the need analysis of the coastal poor communities Oxfam's Disaster Preparedness initiative integrated Savings & Income Generation, Insurance, Health Education and Housing for the communities. A village development council at the village level coordinates the volunteers from the committees for savings, income generation, health, insurance, housing and disaster preparedness.

SOURCE:

*Disaster Vulnerability Reduction in Andhra Pradesh, India:
A Sustainability Approach by N Hari Krishna*

STRATEGY FOR CREATING A CULTURE OF DISASTER PREPAREDNESS IN CBDP PROGRAM BY OXFAM GB IN ANDHRA PRADESH

- Public awareness campaign
- Community mobilizing & training through formal & informal means
- Application of sophisticated remote sensing & early warning systems
- Risk and hazard mapping & Vulnerability analysis
- Institutional and individual capacity building
- Inter-agency coordination and networking
- Advocacy for integration of disaster preparedness in development plans at all levels (environment, power, irrigation, water supply, poverty reduction,
- Agriculture, education, health schemes)
- Integration disaster preparedness in school curriculum
- Mainstream disaster preparedness in the media and intellectual debates.
- Make disaster preparedness as a governance issue.

SOURCE:

Disaster Vulnerability Reduction in Andhra Pradesh, India: A Sustainability Approach by N Hari Krishna

Building Community Assets and Access to Resources

- Access to resources gives households and communities the ability to withstand a shock.
- Ownership of assets allows people a minimum level of well-being against disasters.

A household must have a minimum level of assets to cope with disaster risks. The interaction of assets with risk is always complex. It is not just the level of assets, but also the mix of assets that influences the capacity to manage risks. While the importance of financial and physical assets is obvious, human and social assets have also emerged as important variables in risk management. Assets and indigenous knowledge are the strengths of a community which are interrelated with each and contribute to community development.

Social assets at a community level are made up of community organizations, social groups, cultural groups etc, and at an individual level comprise of relatives, friends, etc. Community-based assets, also include water bodies like rivers, lakes, trees, forests etc. These assets might be contributing to the financial assets of individuals in the community by providing livelihood options as well as act as natural barriers to some disasters.

Physical assets mainly comprise of land, houses, livestock, vehicle, infrastructure etc.. The physical assets of communities in urban areas may be backed by financial assets like insurance, whose losses get compensated in the time of disasters as compared to rural communities among which the concept of insurance is not popular. At a community level physical assets are common properties like community buildings, roads, land, school buildings etc.

Financial assets comprise of savings, credit and insurance coverage. At a community level they comprise of banks, savings groups etc. In some rural areas services like banks, financial institutions are not present. For savings people mainly depend on self-help groups or non-government organizations. There have been initiatives by the government to cover urban poor and rural communities under insurance, but due to lack of information and awareness they are not optimally utilized.

FINANCIAL RESOURCES

- Credit: to be used for income-generation, asset-building, and consumption.
- Savings: flexible savings programs help households in coping with disasters.
- Insurance: credit and savings - linked insurance for compensating disaster losses.

COMMUNITY NETWORKS AND INFORMATION - SHARING

Importance of community networks in mobilizing resources:

- Relief and Recovery.
- Early Warning and Response Programs.
- Women's Participation in Reconstruction.
- Sharing of information and knowledge: disaster-resistant design, regions of high and low risk, sources of emergency supplies, preparedness plan, etc.

LIVELIHOOD STRATEGY

- Provide financial resources for income-generation activities.
- Diversify income-earning opportunities.
- Organize skills training.
- Commence large-scale public works.
- Implement post-disaster reconstruction program for employment generation.

SOCIAL PROTECTION

- Assistance for improvement in shelter.
- Cash transfers to poorer households.
- Food programs (free distribution, food stamps, subsidies, school-feeding, etc.),
- Assistance for agricultural inputs (subsidies, free packs), and
- Health and education fee waiver programs.

HOUSING

- Housing is one of the most important assets for protection against natural disasters.
- Provides an asset which could also be used for home enterprise, renting, and social use.
- Requires infusion of public and private resources for construction of better houses, strengthening of existing houses, and improvement in sites and services.

Addressing needs of Special People including gender issues

SPECIAL NEEDS OF WOMEN, CHILDREN, ELDERLY AND PHYSICALLY CHALLENGED PERSONS.

Vulnerability and coping capacity varies from people to people. It depends on factors like socio-economic conditions, age, gender, disabilities, health status, etc. For disaster planning, social practitioners should consider the needs of these people as their vulnerability and coping capacity has either diminished or is minimal.

Here we look at gender aspects more closely. We realize that impact of disasters affects men, women and children differently and also basic requirements of women are very specific. Women and children are the worst affected in any disaster and most in need. It can be seen that gender based inequalities are deep rooted and this situation increases the vulnerability of women further during disaster situation.

On the following page is an analysis of some important gender concerns which are overlooked by decision makers and community members in normal as well as disaster situations and its impact on women in particular and the overall community.

IMPORTANT CONSIDERATIONS OVERLOOKED	IMPACT ON WOMEN AND THE COMMUNITY
Representation of women in planning and decision making and participation in community consultation especially for emergency shelters, medical aids, etc.	<ul style="list-style-type: none"> • Special concerns of women remain unattended • Gender based inequalities continue to grow
Cultural Systems and privacy needs of women	<ul style="list-style-type: none"> • Distribution of relief material unfair • Women feel insecure • Women underpaid or not paid for their hardwork
Livelihood needs	<ul style="list-style-type: none"> • Growth in unemployment • Women headed families suffer economically and psychologically. • Additional burden imposed on women in crises situation
Security and safety needs	<ul style="list-style-type: none"> • Sexual and physical abuse • Women Trafficking • Transmission of HIV and STD • Psychological impact
Special needs: sanitary supplies and clothing	<ul style="list-style-type: none"> • Unhygienic condition • Health problems • Psychological impact
Special needs: of pregnant and lactating women like medical help and food supplements	<ul style="list-style-type: none"> • Malnourished babies and mother • Difficult deliveries • Deformities and health issues
Access to information	<ul style="list-style-type: none"> • Participation in decision making and outdoor activities remains minimum • Deprived of relief material • Health hazards
Entitlements rights	<ul style="list-style-type: none"> • Continues their financial dependence on other members of the family • Lack of power to change their situation

WOMEN AS FLOOD MANAGEMENT PRACTITIONERS

ADPC experience in Cambodia

PRIMARY CARE GIVERS

- Providing care to young, sick and elderly in the family
- Female nurses and social workers in the community

FAMILY FLOOD RISK MANAGEMENT PRACTITIONERS

- Stockpiling of fuel, food, medicine, etc., sharing flood info
- Managing temporary household evacuation (packing, sorting, etc.), sharing flood info, collecting relief
- Cleaning and making repairs to the house

COMMUNITY PLANNERS

- Contributors to family income and are familiar with the community as well as the natural environment

WOMEN AS 'RISK COMMUNICATOR'

- More attune to the happenings in the neighborhoods and the surroundings
- Responsible for the well beings of the family
- Participate actively in community social networking

Each community practice for Disaster Risk Reduction is context specific. However, special efforts need to be made to promote social inclusion (participation of women, persons with disabilities, dalits and other marginalised communities). Most of the time a common action plan may not be possible with specific groups of people having specific needs, hence diverse solutions may form part of the community DRR plans.

Hazard Specific Instructions

Disaster Risk Reduction begins at home – in our schools, places of work and worship, and throughout our local communities. It is here where we will either save lives – or lose them – depending on the steps we take today to reduce our vulnerability to tomorrow’s hazards. For greatest impact, these steps must be grounded in local knowledge and communicated broadly so that everyone, from a local school child to a village grandmother to the municipal mayor, knows how to protect him or herself from nature’s vicissitudes.

IMPORTANT GUIDELINES IN CASE OF EMERGENCY

Always, If time permits take care of the following:

-
- ❗ Listen to a battery-powered radio and follow local evacuation instructions.

 - ❗ Secure your home: Unplug electrical equipment, such as radios and televisions, and small appliances, such as toasters and microwaves.

 - ❗ Leave freezers and refrigerators plugged in unless there is a risk of flooding.

 - ❗ Follow recommended evacuation routes.
Do not take shortcuts; they may be blocked.

 - ❗ Be alert for washed-out roads and bridges.

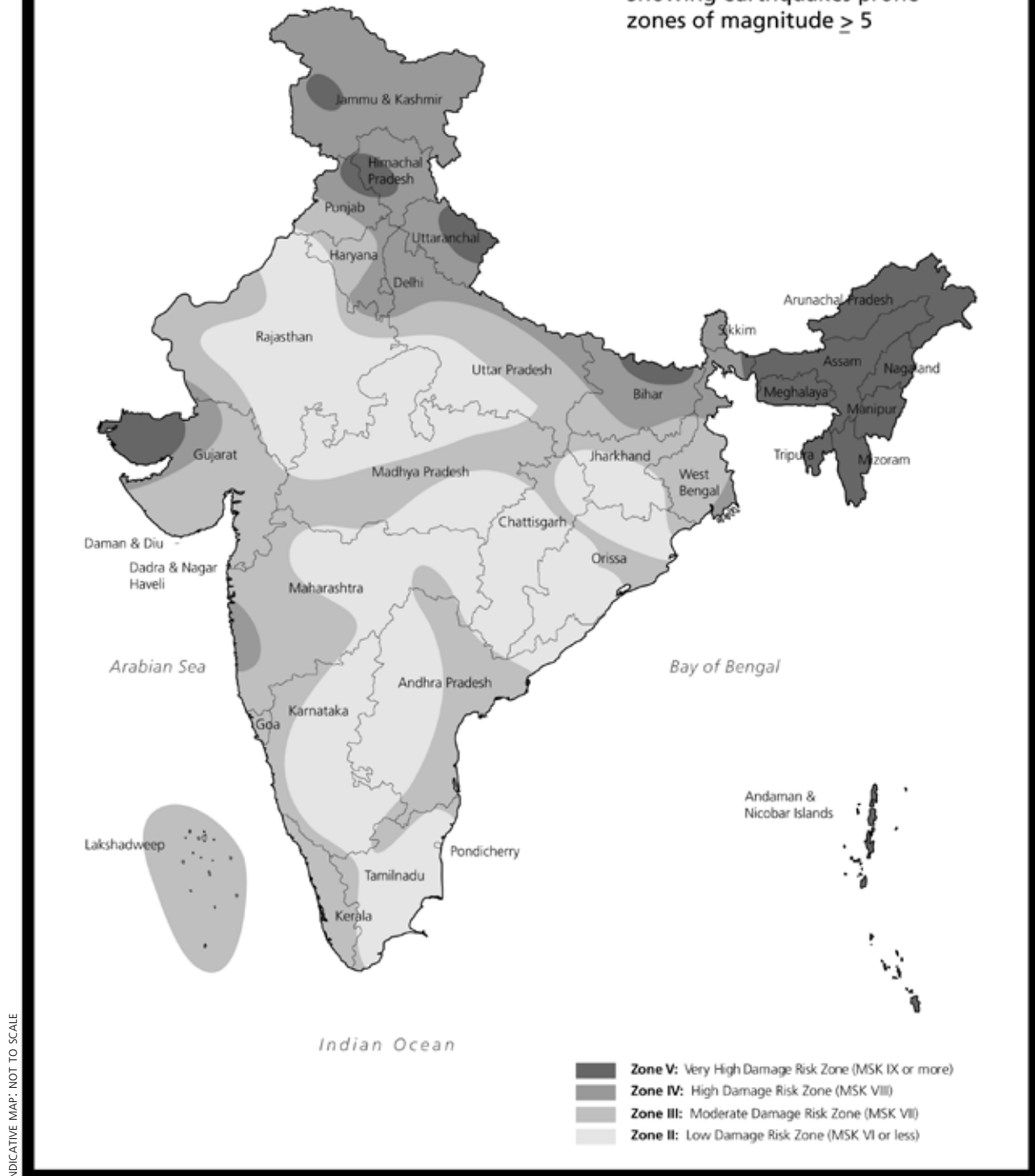
 - ❗ Do not drive into flooded areas.

 - ❗ Stay away from downed power lines.
-

INDIA

Earthquake Hazard Map

Showing earthquakes prone zones of magnitude ≥ 5



ADOPTED FROM:
Vulnerability Atlas of India, BMTPC, World Bank, 2004

EARTHQUAKE

Points To Remember :: PREPARE YOURSELF

- Insure your house against damage.
 - Before you buy a flat, check legality of the construction – ask for copy of the ‘Building Use permit’ or ‘occupation certificate’.
 - Ensure all cabinets, wall hangings are anchored to the walls.
 - Sensitize your neighbours about the earthquake risk they face and organize repair work if required.
 - Get your building reviewed by a competent and registered structural engineer.
 - Structural retrofitting should be done only under supervision of a structural engineer.
 - Ensure all clearances before construction of new building.
 - Check if the land is not prone to flooding.
 - Check the soil is not soft and is not liquefiable and build on solid natural ground.
 - Get your building plans approved from the relevant authorities.
 - Ensure there is good connection between roof and walls, foundation and walls, at wall corners.
 - Enforcement of building byelaws.
 - Strengthening of public buildings.
-

EARTHQUAKE

When You Know there is an Earthquake

DO THIS!

- If already inside, then stay indoors! Get under a heavy desk or table and hang on to it.
- If fire breaks out, drop on the floor and crawl towards the nearest exit.
- If you are out doors during the earthquake, keep away from buildings, trees and electricity lines. Walk towards open places, in a calm and composed manner.
- If you are driving, quickly but carefully move your car as far out of traffic as possible and stop. Stay inside the car until shaking stops.
- If you are in a school, get under a desk or table and hold on to it.
- If you are near an exit, leave the building as soon as possible.
- If you are in high-rise building, staircase do drop cover and hold sit or lie besides under mentioned furniture.

DON'T

- **Do not panic**
- Do not stop on or under a bridge or overpass or under trees, light posts, power lines, or signs.
- Do not be afraid of the aftershocks .
- Do not enter into the unsafe or risky houses or buildings.

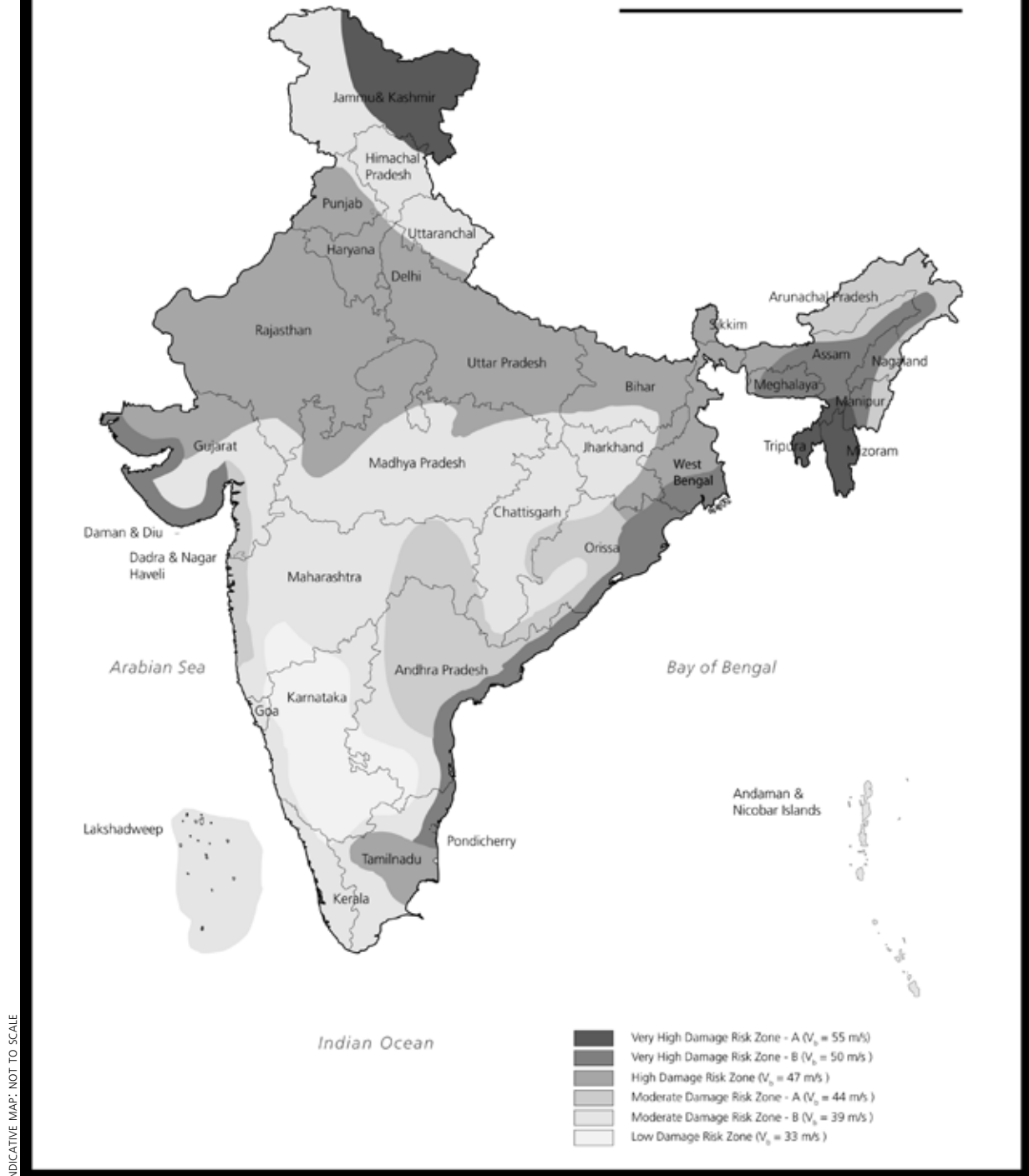
EARTHQUAKE

After An Earthquake

- Listen to radio or TV and other media for Government Announcements.
 - Check for injuries to yourself and those around you. Take first aid where you can.
 - Extinguish fires, if any.
 - Examine walls, floors, doors, staircases and windows to make sure that the building is not in danger of collapsing.
 - Inspect for Gas leaks — if you smell gas or hear blowing or hissing noises, open a window and quickly leave the building. Don't light your kitchen stove if you suspect a gas leak.
 - Do not keep telephone lines busy unnecessarily.
 - Switch off electric lines.
-

INDIA

Wind & Cyclone Hazard Map



ADOPTED FROM:
Vulnerability Atlas of India, BMTPC, World Bank, 2004

CYCLONE

Points To Remember ::

DO'S IF YOU ARE IN A CYCLONE PRONE AREA

- Make plans to secure your property.
 - Install straps or additional clips to securely fasten your roof to the frame structure.
 - Trees and shrubs should be well trimmed.
 - Clear loose and clogged rain gutters and downspouts.
 - Secure loose objects like boats, drums, etc.
-

IN CASE OF A CYCLONE

- Listen to the radio or TV for information.
 - Secure your home, close storm shutters, and secure outdoor objects or bring them indoors.
 - Turn off utilities if instructed to do so.
 - Avoid using the phone, except for serious emergencies.
 - Ensure a supply of water for sanitary purposes.
-

CYCLONE

YOU SHOULD EVACUATE UNDER THE FOLLOWING CONDITIONS:

- If you are directed by local authorities to do so.
 - If you live in mobile home or temporary structure— such shelters are hazardous during cyclones no matter how well fastened to the ground.
 - If you live in high rise buildings—Winds are stronger at higher elevations.
 - If you live on the coast, on a floodplain, near a river, or an inland waterway.
 - If you feel you are in danger.
-

CYCLONE

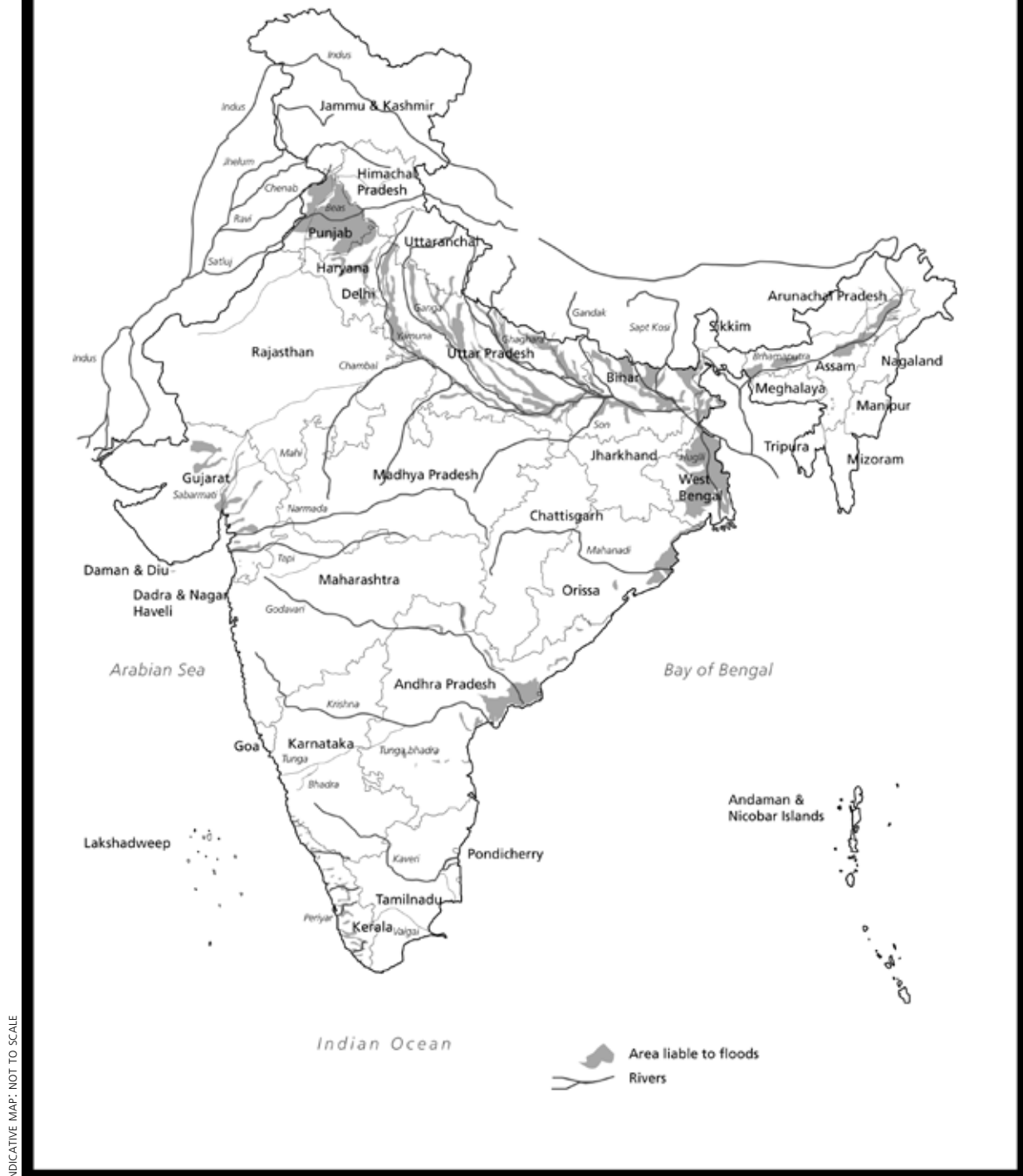
IF YOU ARE UNABLE TO
EVACUATE, GO TO A WIND
SAFE ROOM.

**If you do not have one,
follow these guidelines:**

- Stay indoors during the cyclone and away from windows and glass doors.
 - Close all interior doors - secure and brace external doors.
 - Keep curtains closed. Do not be fooled if there is a lull; it could be the eye of the storm. Winds will pick up again.
 - Take refuge in a small interior room, closet or hallway on the lowest level.
 - Lie on the floor under a table or another sturdy object.
-

INDIA

Flood Hazard Map



INDICATIVE MAP: NOT TO SCALE

ADOPTED FROM:
Vulnerability Atlas of India, BMTPC, World Bank, 2004

FLOODS

Points To Remember : : DO THE FOLLOWING AND BE PREPARED
if you are in a flood prone area

- Avoid building in a floodplain unless you elevate and reinforce your home.
 - Elevate the pumps and electric panel if susceptible to flooding.
 - Install 'check valves' in sewer traps to prevent flood water from backing up into the drains of your home.
 - Construct barriers (levees, beams, floodwalls) to stop floodwater from entering the building.
 - Seal walls in basements with waterproofing compounds to avoid seepage.
-

IF A FLOOD IS LIKELY IN THE AREA

- Listen to the radio or TV for information.
 - Be aware that flash flooding can occur. If there is any possibility of a flash flood, move immediately to higher ground. Do not wait for instructions to move.
 - Be aware of streams, drainage channels, canyons, and other areas known to flood suddenly. Flash floods can occur in these areas with or without such typical warnings as rain clouds or heavy rain.
 - If you must prepare to evacuate, you should do the following:
 - Secure your home. If you have time, bring in outdoor furniture. Move essential items to an upper floor.
 - Turn off utilities at the main switches or valves if instructed to do so. Disconnect electrical appliances. Do not touch electrical equipment if you are wet or standing in water.
 - If you have to leave your home, remember these evacuation tips:
 - Do not walk through moving water. Six inches of moving water can make you fall. If you have to walk in water, walk where the water is not moving.
 - Use a stick to check the firmness of the ground in front of you.
 - Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground if you can do so safely. You and the vehicle can be quickly swept away.
-

AFTER A FLOOD, DO THESE

- There is a possibility of spread of water borne diseases after flood, hence medical treatment should be taken immediately.
 - Sprinkle medicines in the stagnant dirty water.
 - Inspect your house for any cracks or other damage. Check all the walls, floor, ceiling, doors and windows, so that any chance of house falling down can be known and you can be aware about the immediate danger.
 - Keep listening to weather forecast on radio and television. Move to your residence only when instructed by the competent authority. It is not safe to believe that the problems have ended after the flood water have receded.
 - Inform the competent authority/officer for restoration of the necessary connections like gas, electricity, telephone, drainage, etc.
 - Beware of the various insects or poisonous snakes that may have been dragged inside the house along with the floodwater.
 - Destroy the food commodities that have been affected by floodwater.
 - Check properly all the electric circuits, floor level furnace, boilers, gas cylinders, or electric equipments like motor pump etc. Check whether any inflammable or explosive item has not entered along with the floodwater.
 - Switch off the main electric supply, if any damage is noticed to the electric equipments.
 - Sewerage system should be checked and any damage should be repaired immediately so as to curtail spread of diseases.
 - Empty the water clogged in the basement slowly with help of water pump so that damage to infrastructure can be minimised
 - Check gas leakage which can be known by smell of gas or by hearing the sound of leakage; immediately open all windows and leave the house.
 - Boil drinking water before use and drink chlorinated water.
 - Eat safe food.
 - Rescue work should be undertaken immediately after flood situation as per the instructions.
-

AFTER A FLOOD, DO NOT DO THESE

- Do not enter deep, unknown waters.
 - Do not go near the riverbank even after the floodwater has receded.
 - Do not try to leave the safe shelter to go back home until the local officials declare normalcy after flood and instruction to return home are not given.
 - Do not use polluted water.
 - Do not follow any shortcut for rescue work.
 - If you find any breakage in the drainage system stop using latrines and do not use tap water.
 - If the floodwater has entered the house or has surrounded the house, then it is advisable not to enter such house.
-

FIRE

A fire can become a threat in just a few minutes. It takes only few minutes to engulf a building or even less if the roof is thatched. But a little bit of caution and care can prevent many accidents.

Points To Remember ::

DO THE FOLLOWING AND BE PREPARED

- Install fire extinguishers, maintain them and learn how to use them.
 - Keep a few buckets full of water and sand handy.
 - Make an escape plan and practice the escape routes.
 - Keep the kitchen stove area clean and clear of combustibles like fuel and match boxes.
 - Do not let trash accumulate.
 - Keep the electrical wiring in good condition. Do not ignore any spark.
 - Make sure the windows are not painted shut or nailed.
 - Store flammable liquids in the labs in well-ventilated storage areas.
 - Do not work with unknown chemicals.
-

IN CASE THERE IS A FIRE

- If your clothes catch fire—stop, drop and roll or cover yourself with a blanket. Do not run till it is doused.
- Get out as fast as possible and use the stairs if you are upstairs. Avoid using the elevator, you may get trapped in it.
- Test the door for heat with the more sensitive back of your hand, not your palm. Open if the door is cool.
- If thick smoke is blocking the usual route, try escaping from a safe door or a window.
- While escaping, keep low and cover your mouth. Heat and smoke are more dangerous than flames. Inhaling smoke can sear your lungs.
- Crawl to escape smoke and shut doors to slow down spread of fire.
- Once safely out, stay out.

AFTER A FIRE

- If there are any burns, cool and cover it to prevent spread of infection
- Call for help.
- Do not try to open any box or safe right away.

SOURCE:

<http://www.tsunamiresponsewatch.org/2006/10/16/how-to-prevent-fires/>

DRR: Policy Environment and Local Action

Policy environment on disaster risk reduction can be traced back to early 1990s, when in 1991, the UN assembly adopted resolution for integrated approach for disaster management and promoting culture of prevention. In 1994 the Yokohama Strategy for a Safer World provided guidance on reducing disaster risk and the impacts of disasters. It called for establishing national platforms for disaster risk reduction objectives, implementation of agreed policies, increase understanding of DRR. The need to develop national platform and international coordination to deal with disasters was also articulated.

In January 2005, The World Conference on Disaster Reduction was held in Kobe, Japan. It stressed the need to build linkage between DRM strategy and local development planning; strengthen political will, sustained allocation of resources and practical action; developing quality database on vulnerability and hazard risks and early warning mechanisms. It also emphasized need to develop legislative provisions and policies as facilitative mechanisms. These points were articulated as three strategic goals and five priority action areas. This is known as Hyogo Framework of Action 2005-2015. India has adopted and committed itself to implementing the Hyogo Framework for Action 2005-2015 by being a signatory.

Hyogo Framework for Action (HFA) 2005–2015

Strategic Goals

1. Linking DRR with development policies, plans and programmes;
 2. Systematically building resilience at all levels;
 3. Incorporating DRR in response and recovery.
-

Priorities for Action

ENSURE THAT DISASTER RISK REDUCTION IS A NATIONAL AND A LOCAL PRIORITY WITH A STRONG INSTITUTIONAL BASIS

- Strengthening national institutional and legislative frameworks for risk reduction
 - Developing and committing resources for the implementation of risk management policies and programmes
 - Promoting community participation
-

IDENTIFY, ASSESS AND MONITOR DISASTER RISKS AND ENHANCE EARLY WARNING.

- Strengthening national and local risk assessments
 - Establishing institutional and community capacities for effective early warning
 - Developing and sustaining technical infrastructure and information management capacities for effective data collection and hazard analysis
 - Build cooperation mechanisms for analysing regional and emerging risks
-

USE KNOWLEDGE, INNOVATION AND EDUCATION TO BUILD A CULTURE OF SAFETY AND RESILIENCE AT ALL LEVELS.

- Strengthening networks and mechanisms for information management and exchange
 - Promoting inclusion of risk reduction in school and community education and training
 - Furthering research into risk and hazard analysis and cost-benefit analysis for risk reduction actions
 - Promoting public awareness to engage media and community interest
-

REDUCE THE UNDERLYING RISK FACTORS.

- Integrating environmental and natural resource management with risk reduction
- Strengthening safety-nets by improving social and economic development practices in health, food security, livelihoods and other sectors
- Incorporating risk management into land-use planning and other technical measure

STRENGTHEN DISASTER PREPAREDNESS FOR EFFECTIVE RESPONSE AT ALL LEVELS.

- Strengthening institutional capacities and training and learning mechanisms to include risk reduction in all aspects of disaster management
 - Strengthening contingency and preparedness planning
 - Promoting community participation
-

To take forward the objectives of HFA, Sub-regional conferences and support mechanisms have been put into place. In this context, it is worth mentioning some of the key events in Asia and India. The 1st Asian Ministerial Conference on DRR was organized at Beijing, China in September 2005. It deliberated on establishing national platforms and legislations, policies to promote national and local ownerships of DRR, visualizing investment on DRR is investment for development, education and training needs for DRR, etc.

The 2nd Asian Ministerial Conference on DRR was subsequently held in New Delhi in November 2007. It focused on (i) mainstreaming DRR in areas of water, housing, sanitation, energy, health, agriculture, education, health, infrastructure and environment; (ii) keeping communities in the centre during mitigation and response (CBDP); (iii) strengthening finance mechanisms –e.g. micro-finance, micro-insurance; (iv) attending to the needs of women, disabled, children, orphans and other vulnerable sections; (v) integrating climate change initiatives; (vi) encouraging public private partnership and (vii) increasing civic engagement in local, national and regional planning and decision making.

Some of the other forums working on disaster risk reduction:

ProVention Consortium

- A learning initiative based in Geneva
- Consortium of Governments, international NGOs, Academic institutions, private sector to increase safety of vulnerable communities.

Asian Disaster Preparedness Centre and Asian Disaster Resource Centre

- UN mandated support mechanisms based in Thailand
- Research and capacity building

SAARC Disaster Management Centre (SDMC)

- Part of regional cooperation subsequent to HFA
- Set up in Delhi with NIDM
- Strengthening of SAARC institutions for DRM

Some of the civil society networks formed to take up DRR are as follows.

Asian Disaster Risk Reduction Network (ADRRN) – promote coordination, information sharing and collaboration among NGOs and other stakeholders for appropriate disaster reduction and response in Asia Pacific region.

National Alliance for Disaster Risk Reduction (NADRR) – linking people’s efforts with policies for positive synergies.

Sphere India Project – developing standards for relief and response, institutionalizing quality and accountability principles.

Duryog Nivaran – research, training and advocacy network committed to promoting disaster risk reduction in South Asia at policy and community level.

BASIN South Asia Regional Knowledge Platform (BASIN SA) - committed to developing knowledge system and promoting collaborative action within South Asia to enable access by the poor to sustainable habitat and livelihoods knowledge platform.

Inter Agency Group – an initiative of international NGOs to coordinate for humanitarian action.

Legislative Provisions and Policies for DRR in India

In India, there have been institutional and structural changes at national and state level. The passage of the Disaster Management Act, 2005 and the formation of Disaster Management Authorities at national and in many States have set the stage for a paradigm shift from a relief centered strategy to that of prevention and pre-preparedness. Some of the states like Gujarat and Orissa had formulated state level DM Acts and Authorities prior to the National Act.

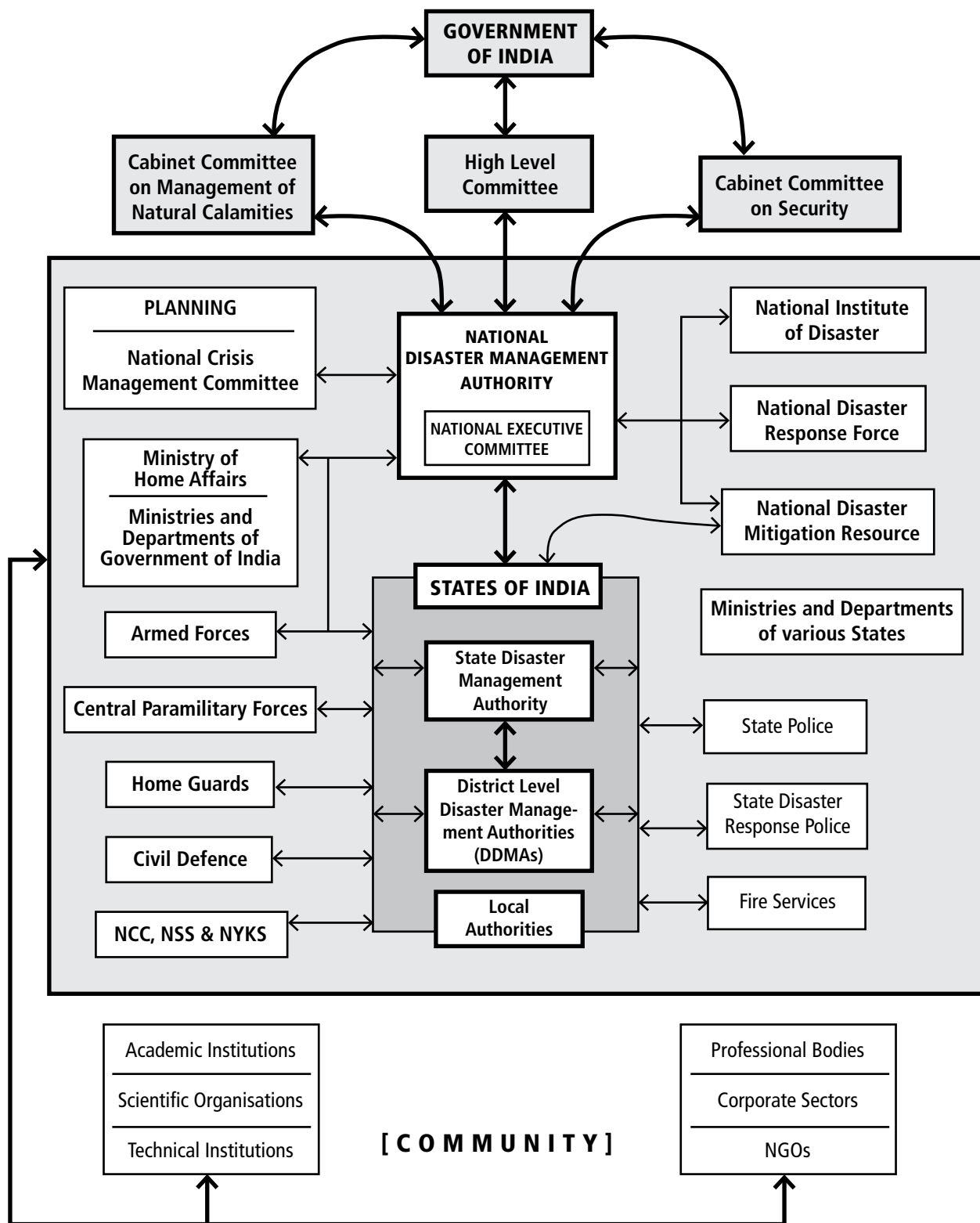
Important feature of the DM Act is to prepare and implement preparedness and mitigation plans in coordination with line departments, local bodies and communities at village, taluka/ block, district and state level. Local community is considered as a primary stakeholder. These plans are conceived as dynamic in nature and there is provision to review and update them periodically.

The key components of the disaster management plan are as follows.

- Types of disaster that may occur and their possible effects;
- Communities, assets and infrastructure at risk;
- Appropriate prevention and mitigation strategies
- Capacity building initiatives
- Integration prevention and mitigation strategies with development plans and other programmes
- Contingency plans including plans for relief, rehabilitation and reconstruction in the event of a disaster. Contingency plan provides for:
 - allocation of responsibilities to the various stakeholders and their coordination
 - procurement and provision of essential goods and services
 - establishment of strategic communication links
 - Dissemination of information.

With the prevailing international and national policy environment, there is a lot scope to work for DRR with overall development planning with community participation. In this context NDMA and various state governments with UNDP support have been taking up CBDP including capacity building of task force, school safety, certification programmes for artisans, housing insurance, formulation of building bye laws, etc. With this overall scenario, as it is envisaged, in the coming years perhaps a paradigm shift to address disaster risks will not only remain at the level of discourse but make difference in the lives of people by reducing risks and vulnerabilities.

NATIONAL DISASTER MANAGEMENT STRUCTURE



SUMMARY OF ADMINISTRATIVE & IMPLEMENTATION FRAMEWORK (NATIONAL ACT) : Entities and Description

NATIONAL AUTHORITY

- Established by the Government of India
- Members: Not exceeding 10
- Chairperson: Prime Minister, ex officio
- Vice Chairperson: Designated by the Chairperson from among the nine members nominated by the PM
- Lay down national policies on disaster management
- Prescribe Minimum Standards for Relief to be provided to persons affected by disaster anywhere in the country

NATIONAL EXECUTIVE COMMITTEE

- Central Government shall, immediately after issue of notification under subsection (1) of section 3, constitute a National Executive Committee
- Assist the National Authority; Executive body of the NDMA
- Chairperson: Secretary to the Government of India in charge of the Ministry or Department of the Government of India having administrative control of the disaster management
- Secretaries of key ministries/ departments and the Chief of the Integrated Defense Staff of the Chiefs of Staff Committee (ex officio)

NATIONAL PLAN

- Plan for disaster management for the whole of the country
- National Plan shall be prepared by the National Executive Committee
- Plan will be as per the National Policy
- It will be prepared in consultation with the State Governments and expert bodies or organizations
- It must be approved by the National Authority

STATE AUTHORITY

- State Disaster Management Authority – notified by respective state Government in the Official Gazette
- Establish a State DM Authority with such name as may be specified in the notification of the State Government (not necessarily be called S-DM-Authority)
- Chairperson: Chief Minister of the State, ex officio
- Specify detailed guidelines & standards for providing relief to persons affected by disaster in the state, subject to the norms set by National Authority

STATE EXECUTIVE COMMITTEE

- Assist the State Authority
- Coordinate action in accordance with the guidelines laid down by the State Authority and directions issued by the State Government
- Chairperson: Chief Secretary, State Government – ex officio
- Chairperson: Powers and functions prescribed by the State Government

STATE PLAN

- State Disaster Management Plan
- Vulnerability of different parts of the State to different forms of disasters
- Measures to be adopted for prevention and mitigation of disasters
- Manner in which the mitigation measures shall be integrated with the development plans and projects
- Roles and responsibilities of different agencies/ line departments in responding to threatening disaster situations or disasters

DISTRICT AUTHORITY

- Members: not exceeding seven, as prescribed by the State Government
- District Disaster Management Authority for every district in the State with such name as may be specified in that notification
- Chief Executive Officer: not below the rank of Additional Collector or Additional District Magistrate or Additional Deputy Commissioner; appointed by the State Government
- Chairperson: Collector or District Magistrate or Deputy Commissioner

DISTRICT PLANS

- District-wise plans will be prepared
- It will identify the risk faced by the district and map the vulnerability zones

LOCAL LEVEL

- Involvement of panchayat
- Enhanced role of local bodies is envisioned

DISASTER VOCABULARY

CAPACITY

Capacities are knowledge, skills, resources, abilities, coping strategies and strengths present in individuals, households, organizations and communities, which enable them to prevent, mitigate, prepare for and cope with damaging effects of disasters or quickly recover from them.

A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster. Capacity may include physical, institutional, social or economic means as well as skilled personal or collective attributes such as leadership and management. Capacity may also be described as capability.

ISDR

COMMUNITY

People living in one geographical area, who are exposed to common hazards due to their location. They may have a common experience responding to hazards and disasters. However, they may have different perceptions of and exposure to risk.

CBDRM

The community-based disaster risk management or CBDRM approach involves activities, measures, projects and programmes to reduce disaster risks which are designed and implemented by people living in high-risk areas with the goal of building safer, disaster resilient, and developed communities.

DEVELOPMENT

Development means ‘improvement in a country’s economic and social conditions’. More specifically, it refers to improvements in ways of managing an area’s natural and human resources in order to create wealth and improve people’s lives. Development is measured in terms of Economic and Human development indicators.

DISASTER

Any occurrence that causes damage, ecological destruction, loss of human lives, or deterioration of health and health services on a scale sufficient to

warrant an extraordinary response from outside the affected community area

www.nhtsa.dot.gov/people/injury/ems/emstraumasystem03/glossary.htm

A disaster (from Greek meaning, 'bad star') is a natural or man-made event that negatively affects life, property, livelihood or industry often resulting in permanent changes to human societies, ecosystems and environment.

en.wikipedia.org/wiki/Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceeds the ability of the affected community or society to cope using its own resources.

United Nations

DISASTER RISK MANAGEMENT

Disaster Risk Management or DRM is a range of activities (preparedness, mitigation, prevention, emergency response, recovery) that contribute to increasing capacities and reducing immediate and long-term vulnerabilities to prevent, or at least minimize, the damaging impact in a community.

The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.

DISASTER RISK REDUCTION

The systematic development and application of policies, strategies and practices to minimise vulnerabilities, hazards and the unfolding of disaster impacts throughout a society, in the broad context of sustainable development.

United Nations Development Programme (UNDP)

The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.

THE DISASTER RISK REDUCTION FRAMEWORK

is composed of the following fields of action, as described in ISDR's publication 2002 *'Living with Risk: a global review of disaster reduction initiatives'*, page 23:

- Risk awareness and assessment including hazard analysis and vulnerability /capacity analysis
- Knowledge development including education, training, research and information;
- Public commitment and institutional frameworks, including organisational, policy, legislation and community action;
- Application of measures including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;
- Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities.

ISDR

EXPOSURE

Elements at risk, such as people and property.

HAZARD

A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

UN/ISDR

A hazard is a phenomena, event, occurrence or human activity which has the potential for causing injury to life or damage to property, livelihood, community facilities, and the environment.

MITIGATION

Mitigation is the collective term used to encompass all actions taken prior to the occurrence of a disaster (pre-disaster measures) including preparedness and long-term risk reduction measures. (Mitigation has been used by some institutions or authors in a narrower sense, excluding preparedness.)

Mitigation refers to measures taken to eliminate or reduce the intensity of hazardous event. They can address existing vulnerabilities through measures like retrofit or strengthening. Actions can be taken to reduce future vulnerability, such as implementation and enforcement of building standards, environmental protection measures and resource management practices.

MITIGATION MEASURES can be directed towards physical, social and environmental vulnerability.

PHYSICAL MEASURES are divided into structural and non-structural measures. Structural risk reduction measures include any actions that require the construction to reduce the effects of a hazard event, such as flood- and wind proofing, elevation, seismic retrofitting and burial of utilities. Non-structural measures are policies and programs that guide future development and investment towards reduced hazard vulnerability. Examples of non-structural measures include physical development plans, development regulations, acquisition of hazardous properties, tax and fiscal incentives and public education.

SOCIO-ECONOMIC MEASURES aim at increasing the resilience of individuals and communities to hazard effects. Activities include raising awareness of hazards and vulnerabilities and helping to establish community and mutual assistance networks and programs.

ENVIRONMENTAL RISK REDUCTION MEASURES are designed to protect existing, or rehabilitate degraded, environmental systems that have the capacity to reduce the impacts of natural hazards. These can take the form of policies and programs, such as development control or environmental impact assessments.

They can also include physical measures that restore or fortify damaged environmental systems, such as coral reef protection, reforestation of critical watersheds or restoration of degraded river courses.

NATURAL PHENOMENA

Natural phenomena are extreme climatological, hydrological, or geological, processes that do not pose any threat to persons or property. A massive earthquake in an unpopulated area, for example, is a natural phenomena, not a DISASTER.

PREVENTION

Prevention covers measures to provide permanent protection from disasters or reduce the intensity/frequency of a hazardous event so that it does not become a disaster. These include safety standards in industries, poverty alleviation and assets redistribution schemes, and provision of basic needs and services such as preventive health care and education.

PREPAREDNESS

Disaster preparedness involves measures taken in anticipation of a disaster to ensure that appropriate and effective actions are taken during the emergency such as setting up the systems for early warning, coordinative and institutional arrangements, evacuation and emergency operations management, public awareness, disaster and evacuation drills, and stockpiling.

EMERGENCY RESPONSES

These are measures undertaken to ensure survival and prevent further deterioration of the situation. These include search and rescue, immediate repair and restoration of critical facilities and utilities, conduct of damage needs and capacity assessment, food and non- food relief assistance, medical assistance, evacuation center management, and networking.

RECOVERY

This covers rehabilitation and reconstruction and can be undertaken within the framework of mitigation and vulnerability reduction, and not just bringing back the situation to pre-disaster levels.

RESCUE

Rescue refers to operations that usually involve the saving of life or prevention of injury.

RESILIENCE

The capacity to adjust to threats and mitigate or avoid harm. Resilience can be found in hazard-resistant buildings or adaptive social systems.

RECONSTRUCTION

These are the actions taken to re-establish a community after a period of rehabilitation subsequent to a disaster. Actions would include construction of permanent housing, full restoration of all services, and complete resumption of the pre-disaster state.

REHABILITATION

These are a set of operations and decisions taken after a disaster with a view to restoring a stricken community to its former living conditions, while encouraging and facilitating the necessary adjustments to the changes caused by the disaster.

RELIEF/ RESPONSE

The provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.

RISK

The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.

UN/ISDR

Risk is the expected lives lost, persons injured, property damaged, and economic activity disrupted due to a particular hazard. Risk is the probability of a disaster occurring and resulting in a particular level of loss.

RISK ASSESSMENT

This determines the scale of the estimated losses which can be anticipated in particular areas during a specified time period. Risk assessment involves an analysis and combination of both theoretical and empirical data concerning: the probabilities of known disaster hazards of particular force or intensities occurring in each area ('hazard mapping'); and the losses (both physical and functional) expected to result to each element at risk in each area from the impact of each potential disaster hazard ('vulnerability analysis' and 'expected loss estimation')

ACCEPTABLE RISK

The level of loss a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions

RISK TRANSFER

These are mechanisms which do not reduce actual vulnerability but reduce financial risk by transfer mechanisms in order to ensure that funds are available when loss occurs.

The main risk transfer/ risk financing methods are:

- Budget self insurance – allocation a small proportion of budget to be spent on improved maintenance.
- Market Insurance and Reinsurance. Insurance provides coverage for damage and expenses that are beyond the potential for budget self-insurance.
- Public asset coverage.
- Risk pooling and diversification
- Risk financing.

VULNERABILITY

Vulnerability is a set of prevailing and long-term factors, conditions and weaknesses, which adversely affect the ability of individuals, households, organizations and the community to protect itself, cope with or recover from the damaging effects of disasters. It denotes exposure to risk and an inability to avoid or absorb potential harm.

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UNNATI - Organisation for Development Education is a voluntary non-profit organization registered under the Societies Registration Act (1860) in 1990. It is our aim to promote social inclusion and democratic governance so that the vulnerable sections of society are empowered to effectively and decisively participate in mainstream development and decision making processes.

It is an issue based, strategic educational support organization working in western India with people's collectives, NGOs, elected representatives in local governance and the government. Collaborative research, public education, advocacy, direct field level mobilisation and implementation with multiple stakeholders are the key instruments of our work. The interventions span from the grassroot level to policy level environment in ensuring basic rights of citizens. In this, inspiration is drawn from the struggles of the vulnerable and strength from our partners. Presently, all the activities are organised around the following programme centres:

SOCIAL INCLUSION AND EMPOWERMENT

The initiatives include:

- Dalit mobilisation and organising in Western Rajasthan in collaboration with local NGOs and people's organisations to fight discrimination.
- Educational support for mainstreaming gender at all levels—internally and for our partners.
- Promoting civic response in mainstreaming disability through educational support to agencies working with persons with disabilities and other civil society organisations.
- Facilitating formation of craft based producers' group of women affected by the Gujarat earthquake for livelihood promotion.

CIVIC LEADERSHIP AND GOVERNANCE

We work in the rural and urban areas. The activities include:

- Community mobilisation for participation in decision making forums and monitoring of basic services to ensure social justice.
- Support elected representatives especially women and dalits to promote accountability through reform in local governance institutions. The support includes capacity building for equitable implementation of development programmes, participatory planning and facilitating social audits.
- Promotion and strengthening of forums like association of women elected representatives, Social Justice Committees and Village Development Committees for facilitating collaborative action.

SOCIAL DETERMINANTS OF DISASTER RISK REDUCTION

We facilitate adoption of sustainable and affordable innovations in the field and research to promote community-based practices for disaster risk reduction. The activities include action research on current community practices, documentation of best practices and research and advocacy on disaster response policies and packages.

The learning derived from our field experiences are consolidated and disseminated in print and electronic forms for wider sharing through a Knowledge Resource Centre. It is our endeavour to build an academy for community leaders, especially dalits and women, so that they can effectively address local issues.



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