



“Disaster Risk Management”

October 5–10, 2009 Islamabad



6-Day course for NWFP and FATA Government officers & NGOs



5th Workshop for MWFP and UNDA Government officials & NGOs on
"Disaster Risk Management"
October 5 – 10, 2009 Islamabad



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Co-Organized by MINTP and FATA Government Offices & NGOs on
"Disaster Risk Management"
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Course Objectives

The overall objective of the initiative is to impart training and necessary skills to concerned officers with regard to disaster preparedness, response and mitigation for saving lives and properties of people from natural and human-induced disasters



Purpose

To provide disaster risk management knowledge and skills to district government officers and civil society members who have key disaster risk management responsibilities at the district level. The course will enable professionals to effectively integrate disaster risk management into their development programs and policies. Participants would be encouraged to develop key skills and adopt proactive attitudes through participation in interactive lectures and reflection on a range of key issues raised during discussions and practical activities.



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Introduction to Disaster Risk Management

Module – 1



Disaster Risk Management Terms and Concepts

1- Hazard

- Hazard is an event or occurrence that provokes disaster.
- A hazard is a natural or human-made phenomenon, which may cause physical damage, economic losses, or threaten human life and well being if it occurs in an area of human settlement, agriculture or industrial activity. Note, however, that in engineering, the term is used in more specific, mathematical sense to mean the probability of the occurrence, within a specified period of time and given area, of a particular, potentially damaging phenomenon of given severity or intensity.
- A hazard can be defined as a phenomenon that has the potential to cause injury to life, livelihoods and habitats.
- **Natural Hazards:** Natural phenomena which pose a threat to people, structures or economic assets and may cause disaster. High winds, floods, fires, volcanic eruption, landslides, droughts and earthquakes are all natural hazards. In this fast developing society, the distinction between natural and man-made hazards is becoming harder to define. For instance, flooding may be increased through landfill, drainage or groundwater extraction; storm surge hazard may be worsened by the destruction of mangroves.
- **Human-man hazards:** Conditions that may have disastrous consequences for a society. These are associated with industries or energy generation facilities and include explosions, leakage of toxic waste, pollution, dam failures. War or civil strife is included in this category.
- **Hazard Assessment:** The process of estimating, for defined areas, the probabilities of the occurrence of potentially damaging phenomena of given magnitude within a specified period of time. Hazard assessment involves analysis of formal and informal historical records and skilled interpretation of existing topographical, geological, hydrological and land-use maps.
- **Hazard Mapping:** The process of establishing geographically where and to what extent particular phenomena are likely to pose a threat to people, property, infrastructure, and economic activities. Hazard mapping represents the results of hazard assessment on a map, showing the frequency / probability of occurrence of various magnitudes or durations.
- **Hazardous Waste:** Any waste which is flammable, corrosive, reactive or toxic and which may pose substantial or potential hazard to human health and safety or to the environment when improperly managed (reactive refers to the ability to enter into a violent chemical reaction which may involve an explosion or fumes).



- **HazMats:** 'Techno jargon' for hazardous materials, which, if released or misused, could pose a threat to people and the environment. HazMats can be explosives, flammable and burnable substances, poisons and radioactive materials.

2- Vulnerability

All the evidence points to a steep and continuing rise in deaths and injuries from disasters since the 1960s, and there is general consensus among researchers and insurers that the number of disasters is increasing. This rise cannot be explained by a parallel rise in the number of earthquakes, cyclones and the like. What we are seeing is an increase in the effects of disasters on people – or, in other words, an increase in people's vulnerability to disasters.

It is the social, cultural, economic and political environment that makes people vulnerable. This is most apparent in the economic pressures that force many of the poor to live in cheap but dangerous locations such as flood plains and unstable hillsides; but there are many less visible underlying factors – social and political as well as economic – that affect people's ability to protect themselves against disasters or to recover from them.

Some groups are more vulnerable than others. Vulnerability is not just poverty, but the poor tend to be the most vulnerable. The influence of poverty and the development process on vulnerability to disasters is now well established. Being poor, and having no choice, increases vulnerability to disasters. Class, caste, ethnicity, gender, disability and age are other factors affecting people's vulnerability. Those who are already at an economic or social disadvantage because of one or more of these characteristics tend to be more likely to suffer during disasters.

Poor people often get locked in a cycle of vulnerability. Because they are poor, they become vulnerable. Because they are vulnerable, they are at great risk in the face of a natural hazard leading to disaster. Because they suffer greater losses from a disaster, they become even poorer, more vulnerable, and are at an even greater risk of another disaster.

- Vulnerability is the susceptibility to harm of those at risk.
- Vulnerability is the coping capacity of those at risk.
- Vulnerability is the degree of susceptibility and resilience of the community and environment to hazards
- Vulnerability depends on the characteristics of a person or group in terms of capacity to anticipate, cope with, resist and recover from the impact of hazard
- The extent to which an individual, community, sub-group, structure, service, or geographic area is likely to be damaged or disrupted by the impact of a particular disaster hazard.



- Conditions of vulnerability are a combination of factors that include poor living conditions, lack of power, exposure to risk, and the lack of capacity to cope with shocks and adverse situations.
- **Classification of Vulnerabilities:** Vulnerabilities can be classified as following:
 - **Physical Vulnerabilities** are the hazard-prone locations of settlement, insecure and risky sources of livelihood, lack of access to basic production resources (such as land, farm inputs, and capital), lack of knowledge and information, lack of access to basic services.
 - **Social Vulnerabilities** are reflected in the lack of institutional support structures and leadership, weak family and kinship relations, divisions and conflicts within communities, and the absence of decision-making powers.
 - **Attitudinal Vulnerabilities** are seen in dependency, resistance towards change, and other negative beliefs. People who have low confidence in their ability to affect change or who feel defeated by events, are harder hit by disasters than those who have sense of their ability to bring the changes they desire.
 - **Economic Vulnerabilities** pertain to how people make their living and from where they get their livelihood. Determining which type of livelihood is easily affected by disasters (e.g. fishing, tricycle driving, etc.) is a key issue to be considered in determining the magnitude of economic vulnerability.
- **Vulnerability Analysis:** The process of estimating the vulnerability to potential disaster hazards of specified elements at risk. For engineering purposes, vulnerability analysis involves the analysis of theoretical and empirical data concerning the effects of particular phenomena on particular types of structures. For more general socio-economic purposes, it involves consideration of all significant elements in society, including physical, social and economic considerations (both short and long term), and the extent to which essential services and traditional and local coping mechanisms are able to continue functioning.

3- Capacity

All natural crisis events such as floods or earthquakes do not become disasters. Some times, they cause no major damage to life or property because they occur where no one lives or because people have taken measures to prevent or reduce their damaging effects. Even when these events do cause damage, not everyone in a disaster area suffers equally. Why is it some people suffer more from disasters than other people? The answer is that some people have fewer capacities and are more vulnerable than others.

Capacity has been included in disaster management initially as a guide for both international and local agencies who work with vulnerable communities to link disasters to development – even in emergency situations disaster survivors have capacities. They are not helpless victims but have coping mechanisms on which to build on for emergency



response and recovery. As the developmental and risk reduction paradigms in disaster management emerged, for many vulnerable groups, the viable track to reduce vulnerabilities has been by increasing their social / organizational capacities.

- Capacity is a community's actual or potential ability to withstand disasters through the presence of material and human resources that aid in the prevention and effective response to disasters. This includes the resources and skills people possess, can develop, mobilize or have access to which allow them to have more control over shaping their future. It is the ability of the community to deal with hazards effectively.
- **Classification of Capacities:** Capacities can be classified as following:
- **Physical Capacities:** Even people whose houses have been destroyed by a typhoon or crops have been destroyed by a flood can salvage things from their homes and farms. Sometimes they have food in storage or crops that can be recovered from the fields or farm implements for planting again. Some family members from the fields or farm implements for planting again. Some family members have skills which enable them to find employment if they migrate, either temporarily or permanently.
- **Social Capacities:** In most disasters, people suffer their greatest losses in the physical and material realm. For rich people, they have the capacity to recover soon because of their wealth. In fact, they are seldom hit by disasters because they live in safe areas and their houses are built with stronger materials. However, even when everything physical is destroyed, people still have their skills and knowledge; they have family and community organization. They have leaders and systems for making decisions and capacities in the social and organizational realm.
- **Attitudinal Capacities:** People have also positive attitudes and strong motivations such as the will to survive, love and concern for and willingness to help each other. Coping mechanisms or strategies are generally considered capacities for survival.
- **Economic Capacities:** This refers to the ability of the business sector to recover and re-establish the economic community.

5- Disaster

The term 'disaster' is defined in different ways. For example:

- Sudden or great misfortune, calamity (Concise Oxford Dictionary).
- A sudden calamitous event producing great material damage, loss and distress (Webster's Dictionary).
- An event natural or man-made, sudden or progressive, which impacts with such severity that the affected community has to respond by taking exceptional measures (Disaster Management, A Disaster Manager's Handbook, Asian Development Bank, Manila).



- An event associated with the impact of a natural hazard, which leads to increased mortality, illness and/or injury, and destroys or disrupts livelihoods, affecting the people or an area such that they perceive it as being exceptional and requiring external assistance for recovery (Cannon 1994).
- An event, natural or man-made, sudden or progressive, which impacts with such severity that the affected community has to respond by taking exceptional measures (Carter 1991).
- Calamity beyond the coping capacity of the effected population, triggered by natural or technological hazards or by human action (D&E Reference Center 1998).
- A disaster is a normatively defined occasion in a community when extraordinary efforts are taken to protect and benefit some social resource whose existence is perceived as threatened" (Dynes 1998).

A disaster is an event concentrated in time and space, in which a society or one of its subdivisions undergoes physical harm and social disruption, such that all or some essential functions of the society or subdivision are impaired (Kreps 1995).

- Disasters are the interface between an extreme physical event and a vulnerable population (Okeefe et al 1976).
- A Condition or situation of significant destruction, disruption and/or distress to a community. (Salter 1997-98).
- A disaster occurs when a disruption reaches such proportions that there are injuries, deaths, or property damage, and when a disruption affects many or all of the community's essential functions, such as water supply, electrical power, roads, and hospitals. Also, people affected by a disaster may need assistance to alleviate their suffering. (Simeon Institute).

6- Disaster Risk

- The probability of meeting danger or suffering harm and loss.
- A measure of the probability of damage to life, property, and/or the environment, which could occur if a hazard, manifests itself, including the anticipated severity of consequences to people.
- Risk = Likelihood x Consequence. (Ansell and Wharton 1992).
- Risk is nothing more than the consequences of hazard (Bezek 2002).
- The possibility of suffering harm from a hazard (Cohrssen and Covello 1989)



- Risk is the probability of an event occurring, or the likelihood of a hazard happening (Presidential/Congressional Commission on Risk Assessment and Risk Management 1997).
- Risk refers to the probability that death, injury, illness, property damage, and other undesirable consequences will stem from a hazard (Lerbinger 1997).
- A function of two major factors: (a) the probability that an event, or series of events of various magnitudes, will occur, and (b) the consequences of the event(s) (Petak and Alkinson 1982).
- Expected losses (of lives, persons injured, property damaged and economic activity disrupted) due to a particular hazard for a given area and reference period. Based on mathematical calculations, risk is the product of hazard and vulnerability (U.N. 1992).
- The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally risk is expressed by the equation Risk = Hazards x Vulnerability/Capacity (U.N. ISDR 2002, 24).

7- Elements at Risk

- Following are described as 'elements at risk'
 - Peoples' lives and health
 - Household and community structure
 - Facilities and services such as houses, bridges, schools, roads, hospitals, etc.
 - Livelihood and economic activities, which include jobs, equipment, crops, livestock, etc.
 - Natural environment

8- Disaster Risk Assessment

- A participatory process of determining the nature, scope and magnitude of negative effects of hazards to the community and its households within an anticipated time period (ADPC, CBDRM 11).
- The First Step of the process identifies hazards in the community. Its output should identify, list down and describe the nature of hazards in terms of its recurrence, seasonality, location, possibility of early warning and general knowledge of the people about the hazard.
- The Second Step captures hazards, vulnerability and natural resources and facilities of the community in community and / or digitized maps.



- The Third Step identifies and assesses the vulnerabilities and capacities of the community in general but makes sure that there is gender desegregation of data; special needs groups like children and disabled are given utmost considerations as well.

9- Disaster Risk Management

- Disaster Risk Management is about looking beyond hazards alone to considering prevailing conditions of vulnerability. It is the social, cultural, economic, and political setting in a country that makes people vulnerable to unfortunate events. The basis of this understanding is simple: the national charter and chosen form of governance can be as much of a determinant in understanding the risks in a given country, as are the various social, economic and environmental determinants (U.N. ISDR 2002).
- A systematic application of management policies, procedures and practices to identify, analyzes, assess, treat, monitor and evaluate risks. This involves decision-making based on the examination of those risks, which includes hazard, vulnerability, and capacity of people and institutions. (ADPC, DMC-30, 2003)

10- Disaster Risk Reduction

- The systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society, avoid (prevention) or to limit (mitigation and preparedness) adverse impact of hazards, within the broad context of sustainable development (U.N. ISDR 2002).

11- Mitigation

- Mitigation is the social attempt to reduce the occurrence of a disaster, to reduce the vulnerability of certain populations, and to more equitably distribute the costs within the society (Dynes 1993, 179).
- Those activities designed to alleviate the effects of a major disaster or emergency or long-term activities to minimize the potentially adverse effects of future disaster in affected areas (FEMA 1990).
- Sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Mitigation distinguishes actions that have a long-term impact from those that are more closely associated with preparedness for immediate response to, and short-term recovery from a specific event (FEMA 1997, Multi Hazard).
- In its simplest sense, mitigation is risk management. The term describes actions that can be taken at the individual, local, State and Federal levels to reduce the overall risk from natural disasters.
- Action to reduce the effects of a disaster on a population (Nimpuno, 1998).
- Mitigation is seen as prevention – stopping a negative event before it happens. (Peterson and Perry 1999, 242).



- Measures taken in advance of a disaster aimed at decreasing or eliminating its impact on society and on environment. (U.N. 1992, 4)
- Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards. (U.N. ISDR 2002, 25)

12- Preparedness

- Those activities, programs, and systems that exist prior to an emergency that are used to support and enhance response to an emergency or disaster. (FEMA 1992)
- Preparedness represents actions that are undertaken to reduce the negative consequences of events where there is insufficient human control to institute mitigation measures. (Peterson and Perry 1999, 242)
- Activities designed to minimize loss of life and damage, to organize the temporary removal of people and property from a threatened location and facilitate timely and effective rescue, relief and rehabilitation.
- Activities and measures taken in advance to ensure effective response to the impact of disasters, including the issuance of timely and effective early warnings and the temporary removal of people and property from a threatened location. (U.N. ISDR 2002, 25)
- Measures to ensure the readiness and ability of a society to forecast and take precautionary measures in advance of an imminent threat, and to respond to and cope with the effects of a disaster by organizing and facilitating timely and effective rescue, relief and appropriate post-disaster assistance.



National Disaster Risk Situation

The October 2005 earthquake highlighted the risk exposure and vulnerability of Pakistan. The decision makers, politicians, media, development workers, international donors and the general populace have become aware for the first time of the major catastrophic risks facing Pakistan. Pakistan's exposure to natural hazards and disasters could be ranked between moderate to severe. A range of natural hazards including earthquakes, droughts, floods, landslides, avalanches, cyclones/storms, tsunami, glacial lake outbursts, and river erosion threaten Pakistan. In addition a variety of human induced hazards also threaten the society, economy and environment in the country. They include industrial, nuclear and transport accidents, oil spills, urban fires and civil conflicts. The high priority hazards from the perspective of disaster risk reduction include earthquakes, droughts, flooding and transport accidents that can cause widespread damage and losses when they occur. The following is an overview of the key hazards that threaten Pakistan.

Earthquakes

The Indo-Australian plate upon which Pakistan, India and Nepal lie, is continuously moving northward, colliding with and subducting under the Eurasian plate, thus forming the Himalayan mountains, and triggering earthquakes in the process. Within the Suleiman, Hindu Kush and Karakoram mountain ranges, the Northern areas and Chitral district in NWFP, Kashmir including Muzaffarabad, and Quetta, Chaman, Sibi, Zhob, Khushdar, Dalbandin, the Makran coast including Gawadar and Pasni in Baluchistan are located within high hazard and very high hazard risk areas. The cities of Islamabad, Karachi and Peshawar are located on the edges of the high hazard areas.

The areas comprising Pakistan have suffered four major earthquakes in the 20th century including the great Quetta earthquake of 1935, the 1945 earthquake off the coast of Makran, the 1976 earthquake in Northern areas, and the October 2005 Kashmir earthquake. In between these major events, the Northern areas and Kashmir have experienced many small quakes with localized impact.

The 7.6 Kashmir earthquake of October 2005 occurred in a region where a major plate-boundary earthquake was considered long over due. Although the earthquake resulted in widespread devastation, the scientists believe that it may not have released more than one tenth of the cumulative elastic energy that has developed since the previous great earthquake in the region in 1555 or earlier¹. The seismologists are also concerned about the absence of earthquakes in Baluchistan in the recent history, which may mean the occurrence of major seismic activities in future.

Seismologists like Dr. Roger Bilham and his associates believe that one or more great earthquakes may be overdue in a large fraction of the Himalaya, threatening millions of people in the region². They also don't rule out the chances of occurrence of ruptures with magnitudes in the range 7.5 Mw. to 8 in the Baluchistan area³.

¹ http://cires.colorado.edu/~bilham/Kashmir_202005.htm- Dr. Roger Bilham of the Cooperative Institute for Research in Environmental Sciences

² Himalayan Seismic Hazard, Roger Bilham, Vinod K Gaur, Peter Molnar

³ Kashmir quake of October 8 2005: A quick look report, Mid America earthquake centre, MAE Report No. 05-04 Ahmed Jan Durrani et al



Droughts

The incidence of drought in Pakistan is becoming increasingly common with substantial consequences on food security, livestock production, environment and natural resources. Low rainfall and extreme variations in temperature characterize the climate in Pakistan. About 60 per cent of the total land area in country is classified as arid, which receives less than 200 mm annual rainfall. The main arid rangelands include Cholistan, Dera Ghazi Khan, D.I. Khan, Kohistan, Tharparkar and Western Baluchistan. The average annual precipitation in Baluchistan and Sindh provinces is about 160mm as compared with 400 mm in Punjab province and about 630mm in NWFP province. Within Baluchistan, the average precipitation varies from less than 50 mm in the southwest to about 400 mm in the northeast. Rainfall variability during different seasons is also considerably high. The climate of the country in lower southern half is arid and hyper-arid. Some regions of the country in each season remain drastically dry and are always vulnerable to drought. Even a small negative deviation from the low mean rainfall creates additional water scarcity in southern provinces of Baluchistan and Sindh and makes them more vulnerable to droughts. In this way drought has become a typical feature in Pakistan. These areas experience two-three drought years in every decade.

All provinces of Pakistan have a history of facing major droughts in the past. In recent years, drought has brought extensive damages to Baluchistan, Sindh and Southern Punjab. Severe drought episodes from 1997-2002 affected livelihoods, resulted in human deaths, forced tens of thousands of people to migrate, and killed large number of cattle. This drought led to 120 deaths and affected 2.2 million people, while 2.5 million livestock died and another 7.2 million livestock were affected⁴. Twenty-three (23) out of the 26 districts in Baluchistan and about 6 districts in Sindh were severely affected. The drought of year 2001 was termed as worst in the history of the country, which reduced the economic growth rate to 2.6 per cent as compared to an average growth rate of over 6 per cent. Furthermore the drought reduced the country's ability to produce hydro-electricity.

In general, per capita water availability is declining in Pakistan over time due to the combined impact of rising population, falling water flows and erosion in the storage capacity. The country's per capita water availability of 1136.5 cubic meters is only marginally above the threshold level of water scarcity i.e. 1000 cubic meters. Experts predict that with prevailing consumption rates and a population growth of 4 million people per year, one out of three people in Pakistan will face critical shortage of water, "threatening their very survival". The Government has started National Water Resources Development Programme (NWRDP) 2000-2025. The program has formulated a strategy for water resources development and identified possible sites for dam construction with a total storage capacity of 35.66 MAF (Million Acre Feet).

Floods

Fifty six (56%) percent of the Indus river basin, one of the largest river basins in Asia, lies in Pakistan and covers approximately 70 % of the country's area (IUCN, 2005). The largest river in the basin is the Indus River with Chenab, Jhelum, Kabul, Ravi and Satlej rivers as its major tributaries.

⁴. **Strengthening National Capacities for Multi-Hazard Early Warning and Response System, Pakistan Meteorological Department, May 2006.**



Generally major floods in the Indus basin occur in late summer (July to September) when the South Asian region is subjected to heavy monsoonal rains. In the upper to mid reaches of the Basin, it is generally the tributaries like Jhelum and Chenab rivers, which are the cause of flooding rather than the Indus River itself. The monsoon low depression that causes intense rain develops either in the Arabian sea or the Bay of Bengal. Major flooding is generally associated with the depression from the bay of Bengal moving across India in west/north-westerly direction and then turning north at the border with Pakistan.

The mountain ranges in the extreme north of Pakistan provide perennial source of inflow into the rivers. River floods particularly hit Punjab and Sindh while hill torrents tend to affect the hilly areas of NWFP, Baluchistan and northern federally administrated areas. Districts of Charsadda, Mardan, Nowshera and Peshawar in NWFP are exposed to flood risks from the flooding in river Kabul.

Since many rivers are snow-fed, they are also likely to cause flooding due to heat wave in early summer, combined with early monsoon⁵. Floods in Pakistan can also occur due to the dam bursts. For example in February 2005, the floods hit Pasni in Baluchistan due to the Shadi Kor dam burst, resulting from a week of torrential rains.

Economic damages resulting from annual flooding are a major burden on the country. Floods threaten country's vital agricultural, communication infrastructure and have caused damages and losses worth Rs. 225 billion (USD \$ 4 billion) recorded for the ten largest floods since country's independence in 1947.

Major Floods of Indus River Basin in Pakistan

Year	Lives Lost	Monetary losses (Billion rupees)	Villages Affected	Area Flooded (miles 2)
1950	2910	9.08	10,000	7,000
1955	679	7.04	6,945	8,000
1956	160	5.92	11,609	29,065
1973	474	5.52	9,719	16,200
1975	126	12.72	8,628	13,645
1976	425	64.84	9,150	32,000
1978	393	41.44	9,199	11,952
1988	508	15.96	1,000	4,400
1992	1008	56.00	13,208	15,140
1995	591	7.00	6,852	6,518
1998	47		161	
2001	201			
2003	230			
Total	7378	225	78,236 / 86471	

⁵ Indus Basin River system-flooding and flood mitigation, H. Rehman, and A. Kamal.



Landslides

The regions of Kashmir, Northern Areas and parts of the NWFP province in Pakistan are vulnerable to landslide hazard. Aside from the young geology and the fragile soil type of the mountain ranges, accelerated deforestation is a major cause behind increased incidences of the landslides in the region. In the aftermath of the 2005 earthquake the steep mountains in Kashmir and NWFP came down tumbling. The landslides isolated already hard to reach villages and cities. In some cases wide sections of the mountain, more than a kilometre in width slid into the valleys below. Small scale isolated landslide hazards happen frequently in the above regions, which cause significant damages and losses at the local level. The incidences of landslides can increase in future, since due to deforestation, the forest cover is shrinking by 3.1 % and woody biomass by 5 % annually (7000-9000 ha taken away annually).

Tsunami

Pakistan also has a history of tsunami disasters. A big tsunami was experienced on 28 November 1945, due to a great earthquake of magnitude 8.3, offshore Makran Coast south of Pasni during the early hours. The tsunami produced sea waves of 12-15 meters height that killed at least 4000 people in Pasni and adjoining areas. The tsunami waves reached as far as Mumbai in India. Karachi, about 450 kms from the epicentre, experienced 6 feet high sea waves which affected the harbour facilities. Fortunately when the sea wave occurred it was not the time of high tide at Karachi coast. The risk of the occurrence of a future tsunami from this source region exists. The fact that cities like Karachi lie close to the potential epicentres for large submarine earthquakes, demands attention for enhancement of local capacities for disaster risk reduction, early warning and response in order to reduce losses to life, property and environment from future earthquake or tsunami events. Tsunami may reach the coastal region within one hour. Thus, there is a need to put in place a warning system that would ensure that the warning message reaches the coastal inhabitants as soon as possible.

Cyclones/storms

Coastal belt of Pakistan (especially in Sindh) is highly vulnerable to cyclones and associated storm surges. Fourteen cyclones were recorded between 1971 and 2001. Cyclones can cause large scale damage to the coastal areas of Sindh and Baluchistan. The cyclone of 1999 in Thatta and Badin districts wiped out 73 settlements, and it killed 168 people, and 11,000 cattle. Nearly 0.6 million people were affected. It destroyed 1800 small and big boats and partially damaged 642 boats, causing a loss of Rs. 380 million. The losses to infrastructure were estimated at Rs. 750 million.

The climate change is causing increase in the frequency and intensity of storms and changes in their tracks. Although the frequency of cyclones is low along Pakistani coast, yet they cause considerable damage in the area, when they occur. Coastal belt is mostly low-lying therefore storm surges extend several kilometres inland and they damage crops and convert the agricultural land into gully lands for long time. Strong winds create havoc by destroying human settlements, electric and communication installations and trees. In the aftermath of cyclones the areas are left water logged where cultivation is not possible for months due to the soil conditions.

Glacial Lake Outbursts

Another likely scenario that can come into play is the burst of glacial lakes in the upstream of Indus basin due to heat

⁶ Indus Basin River system-flooding and flood mitigation, H. Rehman, and A. Kamal



waves, a phenomenon termed as Glacial Lake Outburst Flood (GLOF). A recent study found that, of the 2420 glacial lakes in the Indus basin, 52 lakes are potentially dangerous and could result in GLOF with serious damages to life and property. The study has also indicated that global warming can increase the potential of GLOF in future⁶.

Avalanches

The Kashmir region and northern areas in Pakistan experience avalanches on a regular seasonal basis. Local people in the hazardous region and the tourists are vulnerable to this hazard.

Industrial, nuclear and transport accidents

Transport accidents are a common phenomenon in Pakistan. Particularly the train system in Pakistan is notorious for collisions. Hundreds of people have been killed in such accidents. Plane crashes and road accidents are not uncommon events. The growing industrialization particularly within urban settlements in cities like Gujranwala, Faisalabad, Karachi, Lahore, Sialkot and elsewhere can be a source of major industrial disasters, although Pakistan has not experienced any such events in the past. The neighbouring India suffered from Bhopal Gas leakage in 1985, in which 5000 people were killed and enormous health hazards were experienced by citizens of Bhopal. Having installed various nuclear facilities and nuclear power stations, Pakistan is also exposed to the risks of nuclear accidents. The Chernobyl disaster in Russia must serve as a reminder in this regard.

Pakistan now has two ports in Karachi and Gawadar along the coast of Makran. These areas are at risk from marine accidents. In Karachi, in August 2003 the wreckage of *Tasman Spirit* a Greek oil-ship caused colossal environmental losses and health hazards for the businesses, port workers and adjacent communities. About 28,000 ton oil spilled all over the harbour area, which affected marine life in a major way. The residents in the area reported headaches, nausea and respiratory problems in the weeks following the accident. It took months for the authorities to clear the oil affected areas.

Urban fires

Fortunately Pakistan has not experienced any major urban fire incidents so far. However, considering the pace of urbanization, coupled with industrialization, the chances of urban fires can't be ignored. The CNG gas stations are installed in all urban areas and it is also sold at small shops and stores for household use. In small cities and towns the sale of petroleum products at small shops located within residential areas is also common. These practices combined with mass culture of smoking cigarettes could pose a major fire risk. The fire services in urban centres, except Karachi, are poorly equipped.

Civil conflicts

Pakistan is a diverse society, ethnically, linguistically, religiously and culturally. This diversity has some times led towards civil conflicts amongst various social groups. For example, Pakistan has suffered sectarian conflicts during the 1980s and 1990s. These conflicts caused loss of life and damage to property, while creating insecurity for various social groups in the affected areas. Pakistan has also born the brunt of Afghan war in the form of hosting about 6 million refugees for more than two decades. About 2 million Afghan refugees still live in various parts of Pakistan. This mass scale invasion has damaged the social fabric of Pakistan.



Provincial Disaster Risk Situation

Floods

In upper to mid reaches of the Indus Basin, rivers like Jhelum and Chenab are the cause of flooding. Major flooding is generally associated with the monsoon low depression that develops in the Bay of Bengal and moves across India in west/north-westerly direction to enter Pakistan. Apart from river floods that particularly affect districts of Sialkot, Narowal, Mandi Bahuddin, Sargodha, Khushab, Shikhpura, Layyah, Rajanpur, D.G. Khan, Jhang, Muzaffargarh and Jhelum, flash floods also hit hilly and mountain areas of Punjab, which may cause landslides and road erosion. In recent years, vulnerabilities of large cities to flooding have increased. Cities like Lahore and Rawalpindi have experienced flooding due to inability of sewerage system to cope with heavy rains. The confluence of river basins, the canal irrigation network and interrupted drainage system are some of the major reasons for flooding in Punjab.

Drought

Drought is a slow on set phenomenon that affects various sectors in the vulnerable areas. They affect large geographic areas than floods or other hazards. Drought has many definitions but the common one is the meteorological drought that is characterised by a reduction in rainfall over a region for a specified period below a specified amount. The main arid rangelands in the province include Cholistan, D. G. Khan and Thal areas. Rainfall variation during different seasons is also considerably high. Climate in lower southern part of the province is arid and hyper-arid.

Low rainfall and precipitation over the last 5-6 years have resulted in the lowest water levels recorded in Pakistan. In the year 2000 the rainfall was 14 percent lower than that in 1999

21% of Punjab province's economy was affected by the drought of 1998-2002. According to the Meteorological Department, the districts of Rawalpindi, Chakwal, Jhelum, Bahawalpur, R.Y. Khan, D.G. Khan, Khushab, Multan, Attock, Mianwali, Bahawalnagar, Bhakkar, Layyah, Rajanpur, Narowal and Muzaffargarh are prone to drought hazard.

Landslides

The term landslide is used in its broad sense to include downward and outward movement of slope forming materials (natural rock and soil). It is caused by heavy rain, soil erosion and earth tremors and also happens in areas under heavy snow. In Punjab province, the Murree area is known to be most susceptible to landslides than any other district in the province.

Earthquakes

Earthquakes occur when there is movement of the tectonic plates. Based on studies by the Geological Survey of Pakistan, Punjab, except Murree and Kotli Sattian tehsils in Rawalpindi District, falls away from the fault lines and is unlikely to be affected by massive earthquakes. No major losses have occurred following earthquakes in the recent recorded history in Punjab.

Industrial Accidents

The growing industrialization particularly within urban settlements in cities and main urban areas in Punjab can be a



source of major industrial and chemical disasters. Punjab is Pakistan's most industrialized province. There are over 18,000 industrial units in the province all involved in various aspects of industrial activity from processing of agricultural products, manufacture and assembly of motor vehicles and spare parts, textiles, fertilizers, cement, oil and coal mining, mineral mining, leather, animal feeds construction material, arms and ammunition, beverages, confectionery, textiles, , gas production, coal mining and electricity generation, nuclear power plants and installations, boilers, AC and refrigeration etc.

Pollution

Being the most industrialized province, Punjab is facing a great deal of pollution hazards, especially in its urban areas. There is for example flow of raw sewage in many cities in the province that flows to the rivers, thus polluting the water bodies. There are no designated environmentally certified landfills for much of the industrial waste. This is leading to surface and ground water pollution. A research conducted by the Environment Department in Punjab found out that there are many obsolete pesticides stored in various locations in Punjab province. 100 stores in 28 districts were found to be storing an estimated 933 tons of obsolete pesticides.

Urban and Forest Fires

With growing urbanization and industrialization in the province, risks of urban fires are on the rise. Compressed Natural Gas stations are installed in all urban areas and the gas is also sold at small stores for household use. Sale of petroleum products within residential areas is also common in cities. These practices pose major fire risk in urban areas. According to statistics provided by the Civil Defence in Punjab, during the period of June 2006 to May 2007, there were a total of 2142 fire incidents in various urban centres in the province. Of the same incidents, 281 people were trapped in fire, 133 were rescued in various ways, 66 died and 177 injured.

Communicable Diseases

Communicable diseases form the main bulk of healthcare problems in Punjab. The common communicable diseases in the province are malaria, TB, cholera, smallpox. Avian flue is yet another such disease under close surveillance to prevent pandemic threat.

Crisis Situations

Crisis situations are brought about by unpredictable incidents causing chaos and mayhem. Such situations may include:

- Sectarian violence
- Bomb blast / Bomb scare
- Riots and demonstrations / civil unrest
- Terrorist attack

During the year 2006-07, the Bomb Disposal Squads of the Civil Defence have attended to 116 bomb threat calls and have recovered 82 bombs, anti-tank mines, shells, improvised explosive devices (I.E.Ds) and hand grenades in the province. The number of blasts during the same period (2006—07) was 46. The Bomb Disposal Squad has also carried out 9791 technical sweepings during the same period.



National Disaster Management System

After the promulgation of National Disaster Management Ordinance, 2006 (NDMO), an elaborate system of Disaster Risk Management (DRM) at the national, provincial and district level has been established. The National Disaster Management Authority (NDMA) at the federal level has started acting as focal point to lead the process by facilitating the work of Provincial Disaster Management Authorities (PDMAs) and the District Disaster Management Authorities (DDMAs). The new system envisages to achieving sustainable social, economic and environmental development in Pakistan through reducing risks and vulnerabilities. It has a mission of enhancing institutional capacities for disaster preparedness, response and recovery with a risk reduction perspective in the development planning process at all levels. In line with the vision, the National Disaster Risk Management Framework (NDRMF) has identified the following guiding principles:

- Focus upon most vulnerable social groups; e.g. children, women, elderly, minorities;
- Promote community and local level preparedness culture;
- Follow multi-disciplinary and multi-sectoral approaches;
- Combine scientific knowledge with social knowledge;
- Make development policy, planning and implementation risk-sensitive;
- Develop culturally, economically and environmentally relevant technologies for safer construction in different parts of the country;
- Promote sustainable livelihood practices in areas at high risk from multiple hazards;
- Establish and strengthen partnerships amongst multiple sectors e.g. government, private sector, media, insurance, NGOs, civil society organizations, UN and donors;
- Work with other countries and international community to promote disaster risk reduction;
- Acquire specific capacities / capabilities keeping in view hazard-risk profile of the country; and
- Develop disaster risk management plans from district level upwards in view of specific requirements of the local area.

Priority Areas

The DRM system revolves around the following 9 priority areas, which are being implemented at the national, provincial, district and community level:

1. Institutional and Legal Arrangements:

The National Disaster Management Ordinance calls for the establishment of disaster management commissions and authorities at the federal, provincial and district level. The commissions are mandated to take policy decisions whereas the authorities are the implementing and coordinating arms. The national and provincial disaster management commissions and authorities have been established. Similarly, the DDMAs have also been notified. Under this priority area, the institution of technical committees on various aspects and development of legal instruments, guidelines and procedures are planned to be undertaken.

2. National Hazard and Vulnerability Assessment:

In order to make informed policies, strategies and programs on disaster risk management, a Vulnerability Atlas of Pakistan will be prepared. This would include hazard maps indicating the location of various hazards with



zonation of risk levels (low, moderate, severe). The Atlas will also include analysis on vulnerability of settlements, housing stock, important infrastructure and environmental resources. A disaster inventory will also be developed to facilitate analysis on disaster and vulnerability trends.

3. Training, Education & Awareness:

Training, Education and Awareness programs would involve multiple sectors such as civil servants, federal and provincial ministries, staff of district, provincial and national Disaster Management authorities, technical agencies, UN staff, NGOs, media, politicians and more importantly communities. Apart from trainings on vulnerability reduction, hazard mitigation and emergency response management, specialized trainings are also being imparted in areas of search & rescue, first aid, fire fighting, evacuation, camp management and relief distribution.

4. Promoting Disaster Risk Management Planning"

DRM planning is essential to minimizing adverse effects of hazard(s) through effective disaster risk reduction, preparedness and adequate, timely and coordinated response. It is planned to have a National Disaster Response Plan, which will define roles and responsibilities of federal ministries, departments and other entities in relation to national level disaster response. All the provincial DMAs including AJK and Northern Areas have already developed their respective provincial DRM plans whereas DDMA are in the process of developing local plans.

5. Community and Local Level Risk Reduction Programming

It is rightly believed that the community level program implementation is the heart of disaster risk reduction strategies because disaster risks are essentially local in term of their impact and so as the response. That is why the community based initiatives for the capacity building of local officials and communities, CBOs, builders, contractors, masons, teachers and doctors etc. have been considered of immense importance in the National Framework. The NDMA has launched the first phase of community level activities in Badin & Thatha (Sindh), Quetta & Kech (Balochistan), Mansehra (NWFP) and Muzaffarabad (AJK).

6. Multi-hazard Early Warning System

The early warning capacities for droughts will be enhanced and the Early Warning System (EWS) will be developed for cyclone and tsunami hazards. The role of media will also be enhanced to improve dissemination of warnings. Likewise, communities will be linked with different warning agencies in order to be able to react timely and efficiently.

7. Mainstreaming Disaster Risk Reduction into Development

The purpose of mainstreaming DRR into development is to ensure that the development infrastructure in hazard-prone areas is built to higher standards of resilience against multiple natural and man-made hazards. This will be done by incorporating risk and vulnerability assessment into project planning stage. NDMA will work with the National Planning Commission and the Ministry of Finance in order to integrate disaster risk reduction into the National Development Plan and the National Poverty Alleviation Strategy. Some pilot projects with selected ministries will be initiated on mainstreaming of risk reduction.



8. Emergency Response System

Apart from the National Emergency Operations Centre (NEOC), NDMA will facilitate PDMA's in establishing emergency operations centers at the provincial and district levels. The NEOC would serve as a hub for receiving early warnings and issuing necessary instructions to response agencies. It would also lead coordination and management of relief operations in affected areas. Standard Operating Procedures (SOPs) will be drafted to define roles of federal, provincial and local agencies for their involvement in emergency response.

9. Capacity Development for Post Disaster Recovery

In order to manage disaster recovery programs effectively, it's very important to put institutional arrangements and system in place. NDMA will develop guidelines for recovery needs assessment and recovery program design and management for multiple sectors. Similarly, orientation workshops for line ministries and other stakeholders on post disaster recovery program design and implementation will be organized.

Disaster Risk Management Structure

In line with the provisions of NDMA, the Government of Pakistan has approved and notified the following DRM structure at the national, provincial and district levels:

1- National Level:

1.1. National Disaster Management Commission (NDMC)

Headed by the Prime Minister as its Chairperson, the NDMC is the highest policy and decision making body for disaster risk management. Other members include opposition leaders of both the houses; Chief Ministers of four provinces; Governor NWFP; Prime Minister AJK; Chief Executive of Northern Areas; Chairman JCSC or his nominee; federal ministers for Communications, Defence, Finance, Foreign Affairs, Health, Interior, Social Welfare and Special Education; Chairman NDMA; Representative of Civil Society; and any other person appointed or co-opted by the Chairperson. NDMC is mandated to formulate policies and develop guidelines on DRM, approve DRM plans prepared by Ministries or Divisions of the federal government, arrange and oversee funds, and provide support to other countries affected by major disasters.

1.2. National Disaster Management Authority (NDMA):

NDMA has been established to serve as the focal point and coordinating body to facilitate implementation of disaster risk management strategies. Following are the powers and functions of NDMA:

- Act as the implementing, coordinating and monitoring body for DRM;
- Prepare the National DRM Plan to be approved by the National Commission;
- Lay down guidelines for preparing DRM Plans by different Ministries or Departments and the Provincial Authorities;
- Implement, coordinate and monitor the implementation of the National Policy;
- Provide necessary technical assistance to PDMA's for preparing Provincial DRM Plans;
- Coordinate response in the event of any threatening disaster situation or disaster;



- Promote general education and awareness in relation to DRM; and
- Perform such other functions as the National Commission may require it to perform.

2- Provincial Level:

2.1 Provincial Disaster Management Commission (PDMC):

The PDMC is chaired by the Chief Minister and other members include opposition leader and a member nominated by him. The CM has the powers to nominate other members of PDMC. Similarly, he may designate one of the members to be the Vice Chairperson. The powers and function of PDMC are as following:

- Lay down the provincial / regional DRM policy;
- Approve the DRM Plan
- Review implementation of the Plan;
- Review the development plans of provincial departments and ensure that risk reduction measures are integrated; and
- Oversee the provision of funds for risk reduction and preparedness measures.

2.2 Provincial Disaster Management Authority (PDMA):

The PDMA is headed by a Director General appointed by the Provincial Government. Following are the powers and functions of PDMA:

- Formulate DRM policy and obtain approval of the PDMC;
- Ensure implementation of DRM policies and plans in the Province;
- Coordinate and monitor the implementation of the National Policy, National Plan and Provincial Plan;
- Examine the vulnerability of different parts of the Province to different disasters and specify prevention or mitigation measures;
- Lay down guidelines to be followed by Provincial Departments and District Authorities for preparation of DRM plans;
- Evaluate preparedness and response arrangements of public and private agencies / departments at the provincial level;
- Coordinate response in the event of disaster;
- Give directions to any Provincial department or authority regarding actions to be taken in response to disaster
- Ensure that communication systems are in order and disaster management drills are being carried out regularly.

3- District Level:

3.1 District Disaster Management Authority (DDMC):

The Disaster Management Ordinance put ample emphasis on establishing DDMA's by notifying them in the Official Gazette. DDMA's are headed by District Nazims whereas DCOs / DCs, District



Police Officers (DPOs), EDOs (Health), and any other district-level officer appointed by the District Government are its members. Following are the powers and functions of DDMAs:

- To plan, coordinate and implement DRM measures in accordance with the guidelines laid down by NDMA and PDMA;
- Prepare District Disaster Risk Management Plan (DDRMP) and district Emergency Response plan;
- Ensure that the risk-prone areas are identified and prevention and mitigation measures are undertaken accordingly;
- Ensure that the guidelines for prevention, mitigation, preparedness and response measures as laid down by NDMA and PDMA are followed by all district level departments;
- Lay down guidelines for disaster management plan;
- Monitor the implementation of DRM plans prepared by the district departments;
- Organize and coordinate DRM training programs for district government officials, community members and community-based organizations;
- Set up, maintain, review and upgrade the mechanism for early warnings and dissemination of proper information to public;
- Prepare, review and update district level response plan and guidelines;
- Establish stockpiles of relief and rescue materials;
- Ensure that communication systems are in order and disaster management drills are carried out periodically.



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Disaster Risk Assessment



Overview of Disaster Risk Assessment

- 1- Risk is the probability of something happening in the future, which has a negative consequence (R. Bellers, 199).
- 2- Risk is commonly used to mean the probability or likelihood of meeting danger or suffering harm and loss. Risk is sometimes taken as synonymous with hazard but risk has an additional implication of the chance of a particular hazard actually occurring. It is also the exposure of something of human value to a hazard and is often regarded as the combination of probability and loss.
- 3- Assessment is a participatory process undertaken in phases and involving on-the-spot collection, interpreting and analyzing of information from various sources.
- 4- Disaster Risk Assessment at the community level is hazard, Vulnerabilities and Capacities assessment.
- 5- Community Risk Assessment is a participatory process of determining the nature, scope and magnitude of negative effects of hazards to the community and its households within an anticipated time period. (ADPC, CBRM 11)
- 6- Disaster Risk Assessment involves a participatory analysis and combination of both scientific and empirical data concerning the probabilities of hazards in any particular area, the negative effects expected to result to each element at risk for each particular hazard, and considering the coping mechanisms.
- 7- Risk Assessment is a structured analytical procedure to identify hazards and to estimate the probability of their occurrence, and the consequences in the light of the conditions. These estimates are then compared with a standard or criterion in order to decide whether or not action is desirable, to reduce the probabilities or to protect people, property, or environment.
- 8- Through disaster risk assessment, we get to know the possible disaster situation and predict the severity of possible future hazards, its damaging effects, the needs and available resources at a certain location.
- 9- The assessment process has four steps:
 - **Hazard Assessment:** Identify, list down and describe the nature of hazards in terms of its recurrence, reasonability, location, possibility of early warning and general knowledge of the people about the hazard.
 - **Vulnerability Assessment** Identify what elements are at risk and why (refer to unsafe conditions, dynamic pressures and root causes).



- **Capacity Assessment:** what are people's coping strategies; what resources are still available; who has access and control over these resources?
- **Community's Risk Measurement:** understanding the people's perception of risk

10- Purpose of Disaster Risk Assessment:

- Risk Assessment provides a systematic process for identifying, estimating, and ranking disaster risks.
- It is a required step for the adoption of adequate and successful community-based disaster risk reduction policies and measures (IDNDR, Yokohama Strategy).
- Disaster Risk Assessment is done for the purpose of risk reduction planning to:
 - Identify prioritized risks that need to be reduced;
 - Ensure that the risk reduction is going to be adequate and appropriate;
 - Ensure that risk reduction will be cost effective and sustainable;
 - Balance between preparedness and long-term mitigation measures;
 - Identify if there are other activities that would have a more positive development impact;
 - Identify existing capacities to assist in risk reduction both externally & within communities;
 - Assess if we are succeeding in reducing risk;
- It provides disaster specific baseline data that can be integrated in a situational analysis for development program purposes.
- The information generated through the process can be used for informed estimates in order to draft emergency appeals.

At the end of disaster risk assessment process, all actors should be able to accomplish the following objectives and outputs:



Disaster Risk Assessment Design

	Objectives	Outputs
Step 1	Describe hazards in the community	List and nature of hazards
Step 2	Conduct hazard mapping	Community hazard map Community resource map Digitized map
Step 3	Describe vulnerabilities and capacities of community, of women and men	Capacities Vulnerabilities Analysis (CVA)
Step 4	Determine Disaster Risk	Comprehensive list of risk faced by the communities
Step 5	Rank Disaster Risk	Prioritized list of risks
Step 6	Decide on acceptable level of risk	Agreed levels of risk for family and community security
Step 7	Decide whether to prevent, reduce, transfer, or live with the disaster risk(s)	Agreed strategies



Hazard Assessment

- 1- The purpose of hazard assessment is to specify the nature and behavior of the potential hazards and threats people face.
- 2- Hazard is an event or occurrence that has the potential for causing injuries to life and damaging property and the environment.
- 3- Hazard assessment means the identification of hazards in given location (D&E Reference Center 1998).
- 4- Hazard assessment is a process of estimating, for defined areas, the probabilities of the occurrence of potentially damaging phenomenon of given magnitudes within a specified period of time (Simeon Institute 1998).

Types of Hazards	
Natural disasters	Earthquakes, floods, hurricanes, land and rockslide, droughts, volcanic eruptions, forest fires, tsunami, and storm surge.
Technological (man induced)	Hazardous material, transportation accidents, explosions, epidemics, fires, collapsed buildings.
Internal disturbances	Riots, demonstrations, prison breaks, strikes, terrorism.
Energy and Material Shortages	Strikes, labor problems, price wars, embargo.
Armed conflict	Nuclear or conventional, chemical or biological warfare.

- 5- Underlying causes of the possibility of any new hazard to occur are:
 - **Natural:** Change in the patterns of weather leading to new forms of drought and floods
 - **Economic:** Drastic fluctuations in real value of currency affecting immediate livelihood; other trade related policy changes, structural adjustment measures
 - **Social and Political Trends:** Change in policy for poverty reduction, subsidy programs, re-locating people
 - **Political Structures:** Structural changes within the country such as decentralization / centralization, conflicts
 - **Industrial hazards:** Chemical accidents, poisoning of different kinds



- **Epidemics:** New forms of epidemics such as AIDS

Primary Hazard	Secondary Hazard
■ Floods	Epidemics, snake bite
■ Drought	Epidemics, famine
■ Earthquake	Landslides
■ Civil War	Refugees, epidemics
■ Landslides	Epidemics
■ Pollution	Disease

6- To understand the nature and behavior of hazards, we need to consider following factors:

- **Origin:** The factor or factors which create / result in a hazard. It can be natural or man-made.
- **Warning signs and signals:** Scientific & indigenous indicators that hazard is likely to occur
- **Forewarning:** Time gap between warning signs and the impact of hazard
- **Force:** Factors that make the power of hazards e.g. intensity and magnitude of an earthquake
- **Speed of Onset:** rapidity of arrival and impact
- **Frequency:** Time related patterns of occurrence of hazards
- **Seasonality:** Occurrence of a hazard in a particular time of the year
- **Duration:** Hazard's presence in a time scale



Hazard Matrix

Hazard Type	Origin	Warning Signs	Fore-warning	Force	Speed of Onset	Frequency	Seasonality	Duration
Flood	Rain, River overflow	Rainfall duration, Intensity, Quality, Speed of wind, Temperature, Movement of animals, insects and birds	Relatively short but can vary from a few hours to a few days	Volume of water	Can often be predicted a few days in advance	Seasonal	Monsoon season	Days / weeks

- 7- Small-scale and localized hazards that neither hit the headlines nor appear in disaster statistics have been increasing significantly. Collectively, these can present a more serious problem than any catastrophic event. For example, in densely populated shanty-towns, fires and epidemics are increasingly common events.

Origin or Causes of Hazards

Hazard	Origin or Causes
<ul style="list-style-type: none"> ■ Cyclone ■ Floods 	Wind currents that spin River and coastal rising of water due to intense rainfall, ill-planned structural measures
<ul style="list-style-type: none"> ■ Drought 	Rainfall deficit over long time periods
<ul style="list-style-type: none"> ■ Environmental Pollution 	Caused by air, marine & fresh water pollutants
<ul style="list-style-type: none"> ■ Deforestation 	Cutting forests for livelihood and commercial purposes
<ul style="list-style-type: none"> ■ Earthquake 	Shaking of earth by the waves below the earth's surface
<ul style="list-style-type: none"> ■ Landslides 	Down slope transport of soil & rock by natural vibrations, changes in direct water content or removal of lateral support
<ul style="list-style-type: none"> ■ Epidemic 	Rise in parasitic infestations due to exposure to toxin

- 8- Following are some important points to be considered in Hazard Assessment:

- Look at scientific and statistical data
- Take action to translate scientific data into practical information



- Approach other knowledgeable sources / people
 - Understand various intensities of the same hazard
- 9- **Tools for Hazard Assessment:** There are several tools that can help in hazard assessment but the most commonly used tools are as following:
- Hazard Map: to locate the probable area covered by a hazard's impact and the elements at risk
 - Historical Profile or Time Line: can make us understand how hazards have changed over time; which hazards have happened in the past; or the start of particular hazard occurrence
 - Seasonal Calendar: visualizes the time, frequency and duration of common hazards
 - Hazard Matrix: helps to systematize information on the characteristics of hazards, specifically warning signs and signals, forewarning, speed of onset, frequency, period of occurrence and duration



Vulnerability Assessment

- Vulnerability is the extent to which communities, structure, service or geographic area is likely to be damaged or disrupted by the impact of a particular hazard.
- Vulnerability is a complex combination of interrelated, mutually reinforcing and dynamic factors.
- Vulnerability analysis is the process of estimating the susceptibility of 'elements at risk' to various hazards.
- Vulnerability assessment – the second level of hazard assessment – combines the information from the hazard identification with an inventory of the existing property and population exposed to a hazard. It provides information on who and what are vulnerable to a natural hazard within the geographic areas defined by hazard identification. Vulnerability assessment can also estimate damage and casualties that will result from various intensities of the hazard (Deyle et al. 1998, 129).

1- Types of vulnerability:

- **Physical / Material:** Pertains to the man-made environment of infrastructure, and the natural environment of agriculture, and forestry. It is not limited to the geographical location of population, buildings and crops. This also pertains to the physical capacity of buildings to cope with the battering of forces. The following are factors that determine the magnitude of physical vulnerability:
 - Disaster-prone location of community, houses, farmlands, infrastructure, basic services, etc.
 - Insecure and risky sources of livelihood
 - Lack of access and control over means of production (land, farm inputs, animals, capital, etc.)
 - Dependence on money-lenders / Aarhtis etc.
 - Inadequate economic fall-back mechanisms
 - Occurrence of acute or chronic food shortage
 - Lack of adequate skills and educational background
 - Lack of basic services (education, health, safe drinking water, shelter, sanitation, roads, electricity, communication, etc.)
 - High mortality rates, malnutrition, occurrence of diseases, insufficient caring capacity



- Overexploited natural resources
- Domestic violence, community conflicts, or war
- **Socio-Cultural Vulnerability:** Elements or factors, which come from demographic concerns such as population density and level of awareness. Following are key issues to be considered in assessing social vulnerability:
 - Special categories of vulnerable groups of people i.e. single parents, women, pregnant mothers, mentally and physically challenged, children and babies, elderly.
 - Population density which has a strong correlation with casualties. It is necessary to assess areas of hazards in relation to where people work and live.
 - Common perception and beliefs of the community about hazards, its impact and corresponding mitigation measures.
 - Weak family / kinship structures
 - **Organizational / Institutional:** Vulnerability factors which come from organizational or institutional concerns include:
 - Lack of leadership, initiative, organizational structures to solve problems or conflicts
 - Ineffective decision-making, people / groups are left out, etc.
 - Unequal participation in community affairs
 - Rumors, divisions, conflict (ethnic, class, religion, caste, ideology, etc.)
 - Weak local institutions (government, private organizations) that cater to assisting / responding to the pre-disaster and disaster needs of the community
 - Lack of access to political processes
 - Inconsistency in organizational dynamics which determines how they respond to disasters.
 - **Economic Vulnerability:** Pertains to how people make their living and where they get their livelihood. Determining which type of livelihood is easily affected by disasters is a key issue to be considered in determining the magnitude of economic vulnerability.
 - **Attitudinal / motivational:** Refers to the individual's perception of risk and his / her ability to mitigate and cope with disasters. This also addresses the people's sense of priorities. Those who perceive



disasters as uncontrollable events are harder hit than those who believe that disasters can be mitigated or avoided. The elements of this type of vulnerability include:

- Negative attitude of communities / individuals towards change
- Passivity, fatalism, hopelessness, dependence
- Lack of spirit for taking initiative
- Lack of unity, cooperation, solidarity
- Negative beliefs / ideologies
- Unawareness about hazards and consequences
- Dependence on external support

Things to remember:

- Vulnerability assessment framework must be simple enough to be useful, but complex enough to capture reality
- Vulnerability is specific to location, sector, interest group, etc.
- Vulnerability is dynamic
- Vulnerability is sometimes irreversible
- Vulnerability and poverty are strongly linked with each other.

(M.B. Anderson)



The following guide questions may help the community in accomplishing the Vulnerabilities Assessment Matrix:

Physical / Material	Socio-Cultural	Organizational / Institutional	Economic	Attitudinal / Motivational
<ul style="list-style-type: none"> ● What are the ways the community may be physically vulnerable (land, climate, environment, people's health, infrastructure, food, housing, physical technologies)? ● What adjustments can be made to strengthen existing structures? ● Are building codes adequate? Are codes enforced? 	<ul style="list-style-type: none"> ● What measures are being taken to develop community awareness and capacities to reduce disaster impact? ● What social structures in the community are vulnerable? ● How can social activities be improved? ● How can conflicts / division within the society be reduced? 	<ul style="list-style-type: none"> ● What formal and informal systems are vulnerable? ● How can decision-making be improved? ● How can leadership be improved? 	<ul style="list-style-type: none"> ● How can economic activities be improved? ● What measures are being taken to diversify economic activities to reduce vulnerability/ ● What are the vulnerable livelihoods in the area? 	<ul style="list-style-type: none"> ● How does the community view itself and its ability to deal with the physical, social and political environment? ● Do the people feel they have the ability to shape lives ● Do people feel victimized

2- **PRA tools for Vulnerability Assessment:** A variety of tools can be used to enrich the community's participation in assessing vulnerability. These include following:

- Hazard Maps visualize the elements at risk.
- Transect Walk gives a better understanding of the map done by the community and provides opportunities to ask more questions regarding physical / material vulnerability.
- Seasonal Calendar gives insight in periods of stress, diseases, hunger, debt, etc.
- Livelihood Analysis helps to learn that not everybody is equally affected by hazards; some groups and people are more vulnerable than others.



- Venn Diagram shows the state of coordination among organizations and government agencies, or leadership patterns.
 - Semi-structured Interviews help to assess the motivational vulnerabilities of the community.
 - Problem Tree and Ranking enables community members to express their main vulnerabilities and which one they prioritize to be addressed.
- 3- Although poverty and vulnerability are closely related, they are not synonymous. While people are vulnerable to a hazard because of physical proximity combined with low economic or social status, it is not only the poor who reside in hazard-prone places. When personal, community or national wealth is inadequate even for basic daily security, few investments are made in measures that can help to ensure survival from hazard exposure. On the other hand, in upscale residential areas, which are built on hills and shores, design and engineering technologies are applied to minimize risk but do not eliminate it.



Capacity Assessment

- 1- All natural hazards do not become disasters. Sometimes, they cause no major damage to life or property because they occur where no one lives or because people have taken measures to prevent or reduce their damaging effects. Even when these events do cause damage, not everyone in a disaster area suffers equally. Why it is some people suffer more from disasters than other people? The answer is that some people have fewer capacities and are more vulnerable than others.
- 2- Capacity is a community's actual or potential ability to withstand disasters through the presence of material and human resources that aid in the prevention and effective response to disasters. This includes the resources and skills people possess, can develop, mobilize or have access to which allow them to have more control over shaping their future. It is the ability of the community to deal with hazards and their attendant impact.
- 3- Capacity assessment is the process to determine what people do in times of crisis to reduce the damaging effects of the hazard, and to secure sustainable livelihood by:
 - Understanding people's previous experiences with hazards that enabled them to develop coping strategies
 - Analyzing which resources are available and used by the community to reduce risk, who has access to these resources and who controls them.
 - Assessing capacities of people at risk is a very important step in choosing strategies for community disaster risk reduction and capability building. It is a step in the risk assessment process that most people forget. When we put it aside, we can make mistakes in program design and waste scarce external resources.
- 4- Capacities can be classified as following:
 - **Physical / material:** People with economic and material resources can survive better. These may come in the form of cash, land, tools, food, jobs, or access to credit. The appropriateness and abundance of people's resources make a difference as to whether they can handle or control any kind of threat and whether they can lead a satisfying and dignified life. For example, people with access to food and clean water have better health to withstand disease; those with the means can afford materials and skills to make their homes strong cyclones.
 - **Social / organizational:** People have social resources that help them cope with, resist and handle the threats they may face. For example, communities that are close-knit and have social networks for support are stronger. Communities where good leadership, caring local and national institutions are in place, and where people share the physical resources they have in times of need are more likely to survive. These communities may be economically poor but can be socially strong.



- **Attitudinal / Motivational:** People, who are aware of their abilities and have confidence in themselves, are better able to cope with a crisis. When they have a sense of control over events and the power to change their condition, they are less vulnerable to threats.
- 5- **Coping and Coping Mechanisms:** 'Coping' means 'managing resources' in adverse situations. Coping can include defense mechanisms, active ways of solving problems, and methods for handling stress. Coping mechanisms are employed when vulnerable communities face difficulties in recovering from a disaster. Their livelihood has become unstable; they face food shortages and even hunger. However, previous experiences with seasonal problems and hunger itself have enabled communities to develop coping strategies. Immediate concern is to secure livelihood than maintaining food supplies. People would rather eat less than be forced to sell livestock or tools, which would undermine their livelihood in the long-term. (Maxwell, 1996)
- 6- **Sequence of Coping Strategies:**
- **Stage 1:** At the first stage, communities develop an indigenous coping mechanism to deal with disasters. For instance, they develop a warning system, evacuation routes and places, and coordinate relief efforts. They also rely on kinship relations during crisis. People bank on these capacities in pre and during disaster situation to minimize the loss of life and property.
 - **Stage 2:** The following strategies are employed to overcome normal seasonal stress, when a number of factors converge into a weakening food supply basis:
 - Short-term dietary changes
 - Change in farming practices and patterns
 - Diversification of income sources
 - Temporary migration in search of work during lean months in the farming calendar
 - Sale of non-essential possessions
 - Sale of animals
 - **Stage 3:** In case of a prolonged stress, strategies take a shift from solving long-term problems to short-term gains. Stress often cause change in gender roles and responsibilities; productive and reproductive tasks are done regardless of gender since priority remains on income-generating sources, which include:
 - Essential livestock is sold
 - Seeds for next cropping season are consumed
 - Agriculture tools are sold
 - Money is borrowed from outside on high interest rates
 - Land is mortgaged or sold
 - Migration
 - Sale of essential household belongings



■ Begging

- Stage 4: At this stage, affected population is left with no other option but to take extreme measures such as:
 - Raids on the warehouses of the Government or NGOs where food is stockpiled
 - Permanent out-migration of whole family
 - Residing in relief camps for emergency food
 - Begging
 - Stage 5: Starvation and death
- 7- Coping strategies at community level do not always work but certainly contribute in ensuring survival during disaster. The standard practice of relief agencies usually comes during fourth and fifth stage when affected families threaten to raid warehouses
- 8- If the outsiders ignore existing resources at household and community level during the process of designing risk reduction measures, their indigenous coping mechanisms may be undermined that eventually lead to increasing people's vulnerability.
- 9- Tools for capacity assessment:
- Hazard Map
 - Historical Profile
 - Seasonal Calendar
 - Gendered Resource Mapping
 - Focus Group Discussion
 - Livelihood / coping analysis
 - Institutional and Social Network Analysis



Disaster Risk Management: Operational Areas



Prevention and Mitigation Framework

1. Major Mitigation Components

Certain major components or activities generally apply to mitigation programs. These are covered below under the headings of non-structural mitigation and structural mitigation.

Non-Structural Mitigation

Legal framework: Generally speaking, existing disaster-related legislation tends not to place enough emphasis on mitigation. In establishing or reviewing such legislation, therefore, it may be advantageous to ensure that mitigation requirements are adequately covered. Land-use planning and the application of building codes provide some legal basis for successful mitigation. However, both these aspects tend to fall short of full effectiveness unless they are rigidly enforced.

Incentives: Incentives can often provide better inducements for mitigation than legal impositions. Government grants or subsidies may help to persuade commercial and other institutions to include mitigation measures in their building or reconstruction activities. The provision of government technical assistance can help towards the same end. Insurance can also provide useful incentives: for instance, insurance companies may be persuaded to offer reduced premiums for buildings, once hazard-resistant measures have been incorporated.

Training and education: If mitigation is to be successful, its requirements must be widely known and understood. Therefore, there is a need to train and educate all those involved, including disaster risk management officials, construction specialists and the general public. In this regard, public awareness programs can provide an important foundation by informing people generally of the need for and benefits of mitigation programs. In a more specific sense, programs of training and education are necessary to ensure that mitigation programs would be supported and properly implemented. Four target groups are especially important:

- Public officials who play a vital role in disaster risk management. Appropriate training modules should be incorporated in their career-path training programs and opportunities provided to them to attend specialist courses.
- Technical students whose professional education should include disaster mitigation courses.
- Small builders and craftsmen who may be given on-the-job training in simple mitigation practices.
- School children who should be introduced to simple mitigation measures in the context of environmental studies, natural science or geography classes.

Public awareness: In addition to general awareness, certain particular areas of public involvement are necessary for effective implementation of mitigation programs. These include:

- A good public knowledge and understanding of local hazards and vulnerabilities.
- Public awareness of the kind of mitigation measures which can be applied.
- Public participation in community preparedness programs.



Governments can substantially assist public awareness of safe mitigation practice by ensuring that their own public buildings (such as post offices, tools, hospitals, government offices) and services are built to high safety standards. This will also help to ensure that designers, builders and engineers gain experience in safe construction and, at the same time, contribute to a safer environment.

Institution building: The strengthening of a country's or community's social structure can enhance disaster mitigation capacity. Such strengthening is, however, difficult to achieve. Three possible ways are to extend normal development as follows:

- First, through institution building; Organizations that serve as coping mechanisms can be identified and strengthened. A deliberate effort can be made to increase their institutional capacities and skills thus enhancing their ability to deal with a crisis.
- Second, through increasing the number of coping mechanisms within a country or community. By developing formal institutions and linking them to outside resources, means are established for intervention and the provision of assistance.
- Third, through encouraging actions that promote co-operation among different groups within society. Such cooperation can considerably reduce the social impact of disasters.

In their development activities, both government and non-government agencies should be careful to avoid actions that will further increase or institutionalize a society's vulnerability. It is especially important to identify institutional dependency relationships, particularly those that may be increased in a disaster situation, and work to eliminate them. By increasing self-sufficiency, agencies may improve the ability of families and communities to cope with disaster. This can be a mitigating factor and help to speed recovery. Strong institutions can play a vital role in various aspects of mitigation, such as promoting public awareness programs, training at community levels and monitoring hazards and vulnerabilities.

Warning systems: Various modern developments have significantly improved the ability of disaster management authorities to provide effective warning of impending disaster. Better warning systems have, for instance, been instrumental in evacuating vulnerable groups, moving livestock to safety and mobilizing emergency services and resources. In the particular context of mitigation, three matters are underlined here.

- The steps between the issuing of warning and the taking of action by relevant authorities or vulnerable people are critical.
- Evacuation should only be ordered when there is virtual certainty of hazard impact; a false evacuation order for a hazard that does not materialize can destroy public confidence in the warning system and neutralize several years of preparedness planning.
- To the extent possible, the dissemination of warnings should use duplicate systems to ensure effectiveness. For example, radio message backed up by siren warnings; warning flags backed up by house-to-house visits by local wardens.



Agricultural mitigation measures: Various measures can be applied in agriculture to mitigate the effects of disaster. These include:

- The planting of shelter breaks, comprised of trees and shrubs, to reduce wind effects.
- Crop diversification.
- Adjustments to crop planting/harvesting cycles.
- Food storage programs to insure against shortage arising from disaster.

Structural Mitigation

Non-structural mitigation measures may need to be complemented by structural measures. In the case of flood-prone areas, embankments, regulators, drains or by-pass channels can be provided, where appropriate, to protect areas from damage by floods. Techniques to mitigate the effects of earthquakes, cyclones and floods on structures also exist. Structural mitigation measures may apply to both engineered structures and non-engineered structures.

Engineered structures: Engineered structures involve architects and engineers during the planning, designing and construction phases. They may include buildings ranging in scale from simple dwellings to multi-story office blocks, as well as infrastructure such as electricity pylons to dams, embankments, ports, roads, railways and bridges. While professionals are trained to plan, design and supervise the construction of buildings and infrastructure to achieve necessary structural safety standards, they may need additional training to incorporate mitigation practices into their design of structures resistant to seismic shock, storm winds or floods. The application of sound technical principles is achieved through:

- site planning;
- assessment of forces created by the natural phenomena (earthquake, typhoon and flood);
- the planning and analysis of structural measures to resist such forces;
- the design and proper detailing of structural components;
- construction with suitable material; and
- good workmanship under adequate supervision.

Most countries have building codes for engineered construction. These codes provide general guidelines for the assessment of forces and further analysis, appropriate design methodologies and construction techniques. If a country does not have a building code which specifies design and construction requirements for earthquake and wind forces, such a code should be formulated as soon as possible, technical personnel trained in its use and enforcement ensured. The quality of construction is as important as good analysis and design. Good workmanship must be encouraged by appropriate training and supervision to achieve better performance.

Non-engineered structures: Non-engineered structures are those constructed by their owners themselves or by local carpenters and masons who generally lack formal training. Such structures mainly comprise simple dwellings and public buildings, built with local materials in the traditional manner. In some disasters, high casualties and economic losses can be attributed to the failure of non-engineered structures. The improved designs vary according to the many different traditional ways of building that suit various cultures, climates, available skills and building materials.



Another important aspect of increasing the safety of non-engineered structures is to try to ensure that they are not built on hazardous sites such as steep slopes subject to landslides, floodplains subject to flash floods or river bank erosion, or coastal areas exposed to storm surges. However, people often do not want to leave their traditional homes and the area in which they have been living for generations, even though the location may be hazard prone. Economic pressures may also induce people to settle in hazardous areas. Wherever practical, incentives should be offered to attract people out of hazardous locations; alternatively, consideration may be given to substituting appropriately engineered structures where this might be practical and economic, or mitigation measures introduced in non-engineered constructions so as to enhance their safety.

2. Formulation and Implementation of Mitigation Programs

The requirements and circumstances for formulating and implementing mitigation programs are likely to differ in various countries. However, the information given should be of general assistance.

- If possible, a simple broad strategy should be devised to cover foreseeable mitigation requirements. This strategy should contain component programs, with desirable priorities.
- The strategy should be interlocked, as far as possible, with national development planning, environmental considerations and other disaster risk management activities.
- A system for monitoring and reviewing the strategy should be introduced and applied.
- Responsibility for overseeing and coordinating mitigation activities should be clearly defined. Normally, this responsibility would be vested in the Minister/Official responsible for disaster-related affairs or the Commission on Emergency and Disaster Management, with clear down ward delegation. Responsibility for individual mitigation programs should also be clearly defined.
- There should be a requirement for an annual progress report covering mitigation activities; this should normally be embodied in an annual disaster risk management report to Cabinet.
- Mitigation activity should be regarded as a suitable and productive area for international assistance.
- Since many different agencies are likely to be involved in mitigation programs, the national disaster risk management office (in the case of Afghanistan Department of Disaster Preparedness) or section should be authorized (on behalf of government) to fulfill day-to-day liaison requirements, in order to ensure coordination of effort.
- For individual mitigation programs it is likely that a particular government ministry/department can be given the lead role. For instance, a mitigation program to protect and conserve a vital road system should be led by the Ministry responsible for roads.
- Mitigation programs should not be regarded as, or be allowed to become, a separate activity. They should be part of an integrated national program.

3. Guiding Principles of Mitigation

The following principles are widely recognized as providing a valuable guide to disaster mitigation.

Initiation

Disasters offer unique opportunities to introduce mitigation measures.

Mitigation can be introduced within the three diverse contexts of reconstruction, new investment and the existing environment. Each presents different opportunities to introduce safety measures.



Management

Mitigation measures are complex and interdependent, and they involve widespread responsibility. Therefore, effective leadership and co-ordination are essential to provide a focal point.

Mitigation will be most effective if safety measures are spread through a wide diversity of integrated activities.

"Active" mitigation measures that rely on incentives are more effective than "passive" measures based on restrictive laws and controls.

Mitigation must not be isolated from related elements of disaster planning such as preparedness, relief and reconstruction.

Prioritization

Where resources are limited, priority should be given to the protection of key social groups, critical services and vital economic sectors.

Monitoring and Evaluation

Mitigation measures need to be continually monitored and evaluated so as to respond to changing patterns of hazards, vulnerability and resources.

Institutionalization

Mitigation measures should be sustainable so as to resist public apathy during the long periods between major disasters.

Political commitment is vital to the initiation and maintenance of mitigation.



Drought Mitigation

Drought may be considered in general terms a consequence of a reduction over an extended period of time in the amount of precipitation that is received, usually over a season or more in length. It is thus a temporary aberration, which is a permanent feature of the climate. It should be noted that 'drought is a normal, recurrent feature of climate, and it occurs in virtually all climatic regimes. Droughts, however, have some unique characteristics that may require different approaches to reduce their impacts. Droughts differ from other natural hazards in several important ways:

- slow-onset, creeping phenomenon that makes it difficult to determine the onset and end of the event;
- duration may range from months to years;
- no universal definition;
- no single indicator or index can identify precisely the onset and severity of the event;
- impacts are generally non-structural and difficult to quantify;
- spatial extent is usually much greater than for other natural hazards, making assessment and response actions difficult, since impacts are spread over larger geographical areas;
- because of their potentially long duration, the core area or epicenter will change over time, reinforcing the need for continuous monitoring of climate and water supply indicators
- impacts are cumulative and the effects magnify when events continue from one season or year to the next;

The risk associated with drought for any region is a product of the region's exposure to the natural hazard and the vulnerability of societies within the region to the event. There is little that can be done to alter its occurrence, because drought is a normal part of climate. Vulnerability to drought is determined by social factors such as land use, population increases and migrations from one region to another or from rural to urban areas. Water use trends, environmental degradation, technological changes, and government policies can also alter vulnerability to drought. Vulnerability is dynamic and the factors mentioned above must be monitored to determine how changes in these factors may influence the impacts of future drought episodes.



Table-1: Drought types

- meteorological drought: A situation arising from inadequate and mal-distribution of rainfall;
- hydrological drought: Conditions denote reduced stream flow and inadequate filling of reservoirs, tanks or drying up of water in the surface water storage structures;
- soil moisture drought: Inadequate soil moisture particularly in rain-fed areas which may not support crop growth;
- agricultural drought: characterized by low soil moisture levels: and shortage of water resulting in crop failures;
- socio-economic drought: the reduction of availability of food and income loss, on account of crop failures endangering food and social security of the people in the affected areas;
- famine: when large scale collapse of access to food occurs which without intervention, can lead to

1. Impacts of Drought

The impacts of drought are diverse and often ripple through the economy. Thus, impacts are often referred to as direct or indirect, or they are assigned an order of propagation (i.e. first, second, or third order) (Kates, 1985).

The impacts of drought can be classified into three principal sectors: economic, environmental, and social. The economic impacts of drought are numerous, ranging from direct losses in the broad agricultural and agriculturally related sectors, including forestry and fishing, to losses in recreation, transportation, banking, and energy. Other economic impacts would include added unemployment, increases in food prices and overall disruption of food supply, strain on financial institutions because of farm foreclosures, increased costs of new or supplemental water resource development and loss of revenue to local, state, and federal government. Environmental losses are the result of damages to plant and animal species, Wildlife habitat, and air and water quality; forest and range fires; degradation of landscape quality; and soil erosion. These losses are difficult to quantify, but growing public awareness and concern for environmental quality has forced public officials to focus greater-attention on these effects. Increasing levels of environmental regulation (e.g. water quality, preservation of wildlife habitat) have imposed a new layer of constraints on water managers during water-short periods. This trend is likely to continue. Social impacts mainly involve public safety, health, conflicts between water users, inequities in the distribution of impacts and disaster relief programs, loss of life, increased social unrest, depopulation of rural areas, and reduced quality of life. The response could be guided by better understanding of drought. Drought is a slow onset natural hazard and it offers time and, opportunity to mitigate its impact.

At the later stage, distress induced environmental degradation forces affect communities to take recourse to cutting down vegetative cover to cope with acute food shortages. The situation also results in land degradation and sharp fall in livestock population upsetting the energy cycle of eco-system.



2. Household responses Pattern

Review of existing research on household responses in Asia and Africa to drought induced food crisis conclude that while conditions vary locally, there are identifiable behavioral pattern associated with onset, progression and climax of crisis. The household response to drought induced food crisis generally involve a succession of stages along a continuum of "coping" that runs from risk minimizing effort through a crisis damage containment to the extreme! Instances of household collapse. The sequencing of household response strategies can be grouped according to their relative degree of reversibility. In the interest of simplification, these stages are grouped as (i) risk minimization (ii) risk absorption (iii) survival strategies.

Risk minimization strategies relate to minor adjustment in the resource allocation and utilization of household without much outside help. Risk absorption strategies relied primarily on outside help to "tide over temporary dislocation caused by droughts. Risk minimization and risk absorption strategies are reversible as none of these strategies affect the underlying basis of the victims' potential economy. Thus for the subsistence farmer, land, tools, seed and labor potential remains intact. For the Pastoralists breeding herd is intact. For the landless laborers, his/her ability to work at peak employment period is preserved. All these strategies are reversible. The Risk Survival Strategies undermine the basis of the victims' means of survival. The sale of essential assets like stock or land means that the household position is so desperate that they sacrifice future security for present survival (Peter Walker, 1989). The sequencing of household strategies in the wake of drought induced food scarcity is given below:



3. Risk Minimization Strategies

Table 3: Progression of household level coping strategies	
Risk minimization	<ul style="list-style-type: none"> ● Altering agricultural practices ● Diversification of income sources ● Pastoral lists to hold mixed species of herds ● Temporary migration in search of work ● Drawing upon common property resources ● Drawing upon social relationships
Risk Absorption	<ul style="list-style-type: none"> ● Reducing and modifying consumption ● Borrowing of repayable loans ● Sale of non-productive assets ● Participating in relief works
Risk Survival	<ul style="list-style-type: none"> ● Disposing of productive assets ● Distress migration ● Reliance on famine foods
Household collapse	<ul style="list-style-type: none"> ● Starvation ● Death

Source: Subbiah, 1997

4. Mitigating Drought

Taking actions in advance of drought to reduce its long-term risk—can involve a wide range of tools. These tools include policies, activities, plans, and programs. This section provides an overview of the tools that various government agencies have used in recent droughts, a number of drought plans and a 9-step drought planning process. (Donald A. Wilhite Michael J. Hayes Cody Knutson Kelly Helm Smith)

Because droughts are a normal part of virtually any climate, it is important to develop plans to reduce their impacts. The process discussed in this paper can be adapted to any level of government in any country.

(1) Appoint a Drought Task Force

The drought planning process is initiated through appointment of a drought task force. The task force has two purposes. First, it supervises and coordinates development of the plan. Second, after the plan is developed and during times of drought when the plan is activated, the task force coordinates actions, implements mitigation and response programs, and makes policy recommendations.

The task force should reflect the multidisciplinary nature of drought and its impacts, and it should include representatives of government agencies and universities (e.g. representatives from extension, climatologists, policy specialists, planners). Environmental and public interest groups and others from the private sector, including industries, can be included on the task force, and/or on sector-specific working groups of the risk assessment



committee, or an advisory council, or they can be otherwise involved, as appropriate. The actual makeup of this task force would be highly variable between countries, reflecting the country's political and economic character.

(II) State the Purpose and Objectives of the Drought Plan

As its first official action, the drought task force should state the general purpose for the drought plan. Officials should consider many questions as they define the purpose of the plan, such as the:

- purpose and role of government in drought mitigation and response efforts;
- scope of the plan;
- most drought-prone areas of the country;
- historical impacts of drought;
- historical response to drought;
- most vulnerable economic and social sectors;
- role of the plan in resolving conflict between water users and other vulnerable groups during periods of shortage;
- current trends (e.g. land and water use, population growth) that may increase/decrease vulnerability and conflicts in the future;
- resources (human and economic) that the country is willing to commit to the planning process;
- legal and social implications of the plan; and
- principal environmental concerns caused by drought.

A generic statement of purpose for a plan is to reduce the impacts of drought by identifying principal activities, groups, or regions most at risk and developing mitigation actions and programs that alter these vulnerabilities. The plan is directed at providing government with an effective and systematic means of assessing drought conditions, developing mitigation actions and programs to reduce risk in advance of drought, and developing response options that minimize economic stress, environmental losses, and social hardships during drought.

The task force should then identify the specific objectives that support the purpose of the plan. Drought plan objectives will, of course, vary between regions of the country and should reflect the unique physical, environmental, socioeconomic, and political characteristics of each region. At the region level, plan objectives will place less emphasis on financial assistance measures, than would the objectives of a national plan. Support for educational and research programs should be a shared responsibility of provincial and national government. Objectives that provinces should consider include the following:

- Collect and analyze drought-related information in a timely and systematic manner.
- Establish criteria for declaring drought emergencies and triggering various mitigation and response activities.



- Provide an organizational structure and delivery system that assures information flow between and within levels of government.
- Define the duties and responsibilities of all agencies with respect to drought.
- Maintain a current inventory of provincial and national programs used in assessing and responding to drought emergencies.
- Identify drought-prone areas of the province and vulnerable economic sectors, individuals, or environments.
- Identify mitigation actions that can be taken to address vulnerabilities and reduce drought impacts.
- Provide a mechanism to ensure timely and accurate assessment of drought's impacts on agriculture, industry, municipalities, wildlife, tourism and recreation, health, and other areas.
- Keep the public informed of current conditions and response actions by providing accurate, timely information to media in print and electronic form (e.g. via TV, radio, and the World Wide Web).
- Establish and pursue a strategy to remove obstacles to the equitable allocation of water during shortages and establish requirements or provide incentives to encourage water conservation.
- Establish a set of procedures to continually evaluate and exercise the plan and periodically revise the plan so it will stay responsive to the needs of the province.

(III) Seek Stakeholder Participation and Resolve Conflict

It is essential for task force members to identify all citizen groups that have a stake in drought planning (stakeholders) and their interests. These groups must be involved early and continuously in order to ensure fair representation and effective drought management. Discussing concerns early in the process gives participants a chance to develop an understanding of one another's various viewpoints, and to generate collaborative solutions. These groups are likely to impede progress in the development of plans if they are not included in the process. The task force should also protect the interests of stakeholders who may lack the financial resources to serve as their own advocates. Public participation takes many forms. One way to facilitate public participation is to establish a citizen's advisory council as a permanent feature of the drought plan, to help the task force keep information flowing and resolve conflicts between stakeholders. Another way is to invite stakeholders to serve on working groups of the risk assessment committee.

(IV) Inventory Resources and Identify Groups at Risk

An inventory of natural, biological, and human resources, including the identification of constraints that may impede the planning process, may need to be initiated by the task force. It is important to determine the vulnerability of these resources to periods of water shortage that result from drought. The most obvious natural resource of importance is water: where is it located, how accessible is it, of what quality is it? Biological resources refer to the quantity and quality of grasslands/rangelands, forests, wildlife, and so forth. Human resources include the labor needed to develop water resources, lay pipeline, haul water and livestock feed, process citizen complaints, provide technical assistance, and direct citizens to available services. It is also imperative to identify constraints to the



planning process and to the activation of the plan in response to a developing drought. These constraints may be physical, financial, legal, or political. The costs associated with the development of a plan must be weighed against the losses that will likely result if no plan is in place.

(V) Develop Organizational Structure and Prepare Drought Plan

This step describes the process of establishing relevant committees to develop and write the drought plan and develop the necessary organizational structure to carry out its responsibilities. The drought plan should have three primary components: monitoring, risk assessment, and mitigation and response. It is recommended that committees be established to focus on the first two of these needs; the mitigation and response function can in most instances be carried out by the drought task force (Figure 1).

The drought task force, as originally defined, is composed of senior policy makers from various provinces and national agencies. The group should be in an excellent position to recommend and/or implement mitigation actions, request assistance through various national programs, or make policy recommendations to the legislature and governor.

Specific responsibilities of the task force at this point are to:

1. Determine mitigation and response actions for each of the principal impact sectors, in close cooperation with the risk assessment committee. However, the transferability of these technologies to specific situations in other provinces needs to be evaluated further because they may not be directly transferable in some cases. Working with the risk assessment committee, the task force should come up with recommendations addressing drought on two different time scales:
 - Short-term responses to implement during drought, such as voluntary water conservation guidelines, a hotline, streamlined administrative procedures for evaluating emergency assistance applications, and pre-produced infomercials leading agricultural producers and citizens to information on best management practices.
 - Long-term drought mitigation projects, such as education programs to give various audiences the background they need to interpret drought news reports or scientific drought indices; programs to persuade people to adopt measures that enhance organic content in soil, conserve water, and otherwise boost the resilience of natural and social systems that are vulnerable to drought.

Assuming there is no ongoing drought, it's a good idea to publicize the recommendations of the task force and seek public input before the plan is implemented, particularly if anything seems revolutionary or controversial.

2. Inventory all forms of assistance available from local, provincial and national government during severe drought.
3. Work with the monitoring and risk assessment committees to establish triggers. The monitoring committee can advise the task force on which drought and water supply indices are most relevant for the province or region.



4. Establish drought management areas. These subdivisions may be useful in drought management since they may allow drought stages and mitigation and response options to be regionalized. Climatic divisions are the most commonly used subdivisions at the provincial level, but they may not be the most appropriate, given topographic features, land use patterns, or water use characteristics.
5. The drought task force should disseminate drought monitoring information and for letting the public know about the drought plan.

Monitoring Committee

A reliable assessment of water availability and its outlook for the near- and long-term is valuable information in both dry and wet periods. During drought, the value of this information increases markedly. The monitoring committee should include representatives from agencies with responsibilities for monitoring climate and water supply. It is recommended that data and information on each of the applicable indicators (e.g., precipitation, temperature, evapo-transpiration, long-range weather forecasts, soil moisture, stream-flow, ground water levels, reservoir and lake levels, and snow-pack) be considered in the committee's evaluation of the water situation and outlook for the province.

The monitoring committee should meet regularly, especially in advance of the peak demand season. Following each meeting, reports should be prepared and disseminated to the province's drought task force, relevant provincial and national agencies, and the media. It is essential for the public to receive a balanced interpretation of changing conditions. The monitoring committee should work closely with public information specialists to keep the public well informed.

(VI) Publicize the Proposed Plan, Solicit Reaction

- How the drought plan is expected to relieve impacts of drought. Stories can focus on the human dimensions of drought, such as how it affects a farm family; on its environmental consequences, such as reduced wildlife habitat; and on its economic effects, such as the costs to a particular industry or to the province's overall economy.
- What it will cost to implement each option, and how it will be funded.
- What changes people might be asked to make in response to different degrees of drought, such as restricted lawn watering and car washing, or not irrigating certain crops at certain times.

(VII) Implement the Plan

Once the task force and any external constituencies have agreed on the plan, the task force and/or its designated representatives should oversee implementation of both the short-term operational aspects of the plan and long-term mitigation measures. Periodic testing, evaluation, and updating of the drought plan will help keep the plan responsive to the needs. Long-term mitigation measures, such as implementing policies that require conjunctive use of ground and surface water, may require drafting new legislation and finding funds to support new monitoring and regulation efforts. In any case, it is essential to recognize that reducing long-term vulnerability to drought will require a sustained effort, although it may be a matter of long-term programs undertaken by a variety of agencies.



(VIII) Develop Education Programs

A broad-based education program to raise awareness of short- and long-term water supply issues will help ensure that people know how to respond to drought when it occurs and that drought planning does not lose ground during non-drought years. It would be useful to tailor information to the needs of specific groups (e.g. elementary and secondary education, small business, industry, homeowners and utilities).

(IX) Post-Drought Evaluation

A post-drought evaluation documents and analyzes the assessment and response actions of government, nongovernmental organizations, and others. It provides for a mechanism to implement recommendations for improving the system. Without post-drought evaluations, it is difficult to learn from past successes and mistakes, because institutional memory fades.



Floods Risk Reduction

1. Introduction

It can be anticipated that risks of loss of lives and livelihoods associated with floods can be reduced significantly in situations where the people at risk are aware of the dangers; long warnings can be transmitted directly to those at risk; evacuation to safe areas within a reasonable distance is possible; property insurance is available and affordable; and the civil administrations and infrastructure remain intact. Conversely, risks increase when these conditions are not present.

2. Early warning systems

Flood warning systems operate at three levels. Meteorological warnings provide the longest warning but least accuracy. Once the rain has fallen, hydrological rainfall-runoff models will provide more accurate warnings but shorter warning periods. Flood routing methods based on upstream flow measurements will provide the most accurate predictions, but the warning periods will be shorter.

These methods and high level of technology is not available in other countries, where vulnerability to floods continue to increase.

- The role of government is to provide one official voice in the preparation of early warnings which must be understandable and credible.
- The probability of detection of severe meteorological events is increasing and the false alarm ratio is decreasing.
- Reaching the vulnerable is not easy.
- Early warning without response is meaningless.

Meteorological forecasts

Where available, satellite and radar imagery are very useful for determining where heavy rainfall has occurred. They also provide accurate information where rain has not occurred. This is important information in the case of widespread flooding.

Impediments to the development of meteorological forecasting are the lack of capacity to apply the necessary technology. National forecasting services are poorly equipped and often lack the required technical skills. Even where this capacity is available, institutions from outside the country's borders frequently issue warnings before the national agencies are in a position to do so. National agencies lose credibility because they are less well equipped, and consequently take longer to issue the warnings. They are also at a disadvantage because they have to be conservative when issuing warnings. In these situations, the ideal is a co-operative venture between the national and the external meteorological agencies. This has not yet occurred.



Another difficulty is that the communities at risk are scattered over wide areas and do not have access to telephones or radio communications. These result in frustrations and comments questioning the value of early warning systems when people do not react to them.

Warnings based on flood routing procedures

Warnings based on flood routing procedures are only feasible on large rivers with long travel times measured in days. However, in these rivers the water levels rise slowly and floods seldom result in loss of life or livelihoods. These warnings are nevertheless useful for implementing planned evacuation procedures.

Antecedent precipitation indices

Antecedent precipitation indices are an under-utilized basis for flood warning systems, particularly in moderate to low rainfall regions. In these regions the average soil moisture content prior to the occurrence of a flood is generally low. As a result storm rainfall has to satisfy the soil moisture deficit before appreciable runoff occurs. They also provide a good indication of the amount of additional rainfall required to generate floods. Appropriate action can be taken as soon as additional rainfall is observed.

3. Structural measures

Many developing countries do not have the financial resources to implement structural flood control measures. Large multi-purpose dams with uncontrolled spillways will reduce flood peaks to some extent, but this will generally decrease with increase in flood magnitude. Dams with controlled spillways will have a larger flood peak reduction potential, but can have the opposite effect if incorrectly operated.

Dam failures can have a very large damage potential, but modern dam safety requirements have significantly reduced this likelihood to close to zero in the case of potential 'dry weather' failures. Occasional dam failures during floods usually occur when the flood water levels are already high downstream. The incremental flood magnitude, and increases in water level and water velocity downstream are usually quite small, particularly in the case of breached earth fill dams.

4. An invitation to disaster

There are tens of thousands of people living in unplanned, flood prone settlements in urban areas. In many urban areas in developing countries there are thousands of people living along the banks of rivers below this flood-line. Shacks are often built on all available space right up to the edge of the almost vertical river banks. In some cases shacks are built on refuse dumps within the channel itself. Even minor floods that do not overtop the river banks could engulf the shacks within the river channel, and undermine the river banks causing the shacks on the banks to collapse into the river.

Once the flood water level rises above the river banks the flimsy, densely packed shacks further from the river will start collapsing. The debris from the shacks, particularly floating timber and submerged corrugated iron sheets caught in the fast flowing water will seriously injure escapees attempting to wade through the water even if this is less than knee-deep.



A lot of floating debris will be carried by floods, including uprooted trees from the upstream catchment, and material from destroyed houses and their contents. This debris will hinder rescue attempts and increase the probability that people washed into the river will drown. Debris may also block bridge openings and deflect the flood to another area that would otherwise have been out of danger. Lives may be lost when spectators gather on bridges or on the river banks and their escape routes are cut off as the river rises, or the river banks collapse. It will be impossible to use rubber boats on the river to rescue people trapped in the debris. A major flood will rise rapidly, destroy all shacks in its path and result in a large loss of life.

Options for reducing the flood risk in unplanned settlements

The 'do nothing' option is obviously unacceptable in this situation. Structural flood risk reduction measures are not a viable option as there are seldom suitable upstream dam sites, and there is no unoccupied space on the river banks for the erection of flood levees. Canalization of the river channel will not reduce flood levels. The relocation of families living within flood prone areas to safer areas is long term solution. This can be achieved by the provision of new houses in safe areas for those most at risk. However, there are difficult political decisions that have to be taken before this objective can be achieved.

Those most at risk are usually those who arrived last by which time no other land was available. They therefore have the lowest priority for new houses. If they are given high priority, this policy will become known and will encourage others to deliberately occupy unsafe areas.

Areas that have been evacuated may subsequently be re-occupied if the local authority does not have powers to prevent this happening. Alternatively occupants of shacks in unsafe areas may prefer to stay where they are rather than to move to better housing further from their places of employment, schools, and other facilities. This leaves the implementation of a flood warning system as the only viable short term solution.

River watch systems

A simple community based river watch system should be instituted in all unplanned settlements vulnerable to floods. This could consist of a watchman on the river bank, and previously identified gathering areas to which the affected families could retreat when floods occur. In the short term, often the only viable options to reduce the loss of life in 'vulnerable informal settlements in developing countries are simple and inexpensive river watch systems coupled with awareness programs. These can be upgraded to more sophisticated flood warning systems as finances permit.

Flood warning systems

Automatic rainfall telemetry equipment can be installed at one or more sites upstream of the area. Water level information can be relayed to an operations centre and sirens within the settlements can be activated by radio from the operations centre when the water level in the river reaches a level that is likely to pose a risk in the settlement area. The advance warning may be very short-possibly less than 30 minutes—so it is imperative that the communities at risk should know what to do when the sirens are sounded.

The final solution is to provide incentives that will encourage the threatened communities to move to less vulnerable areas. In many cases this will be a long process as housing will have to be provided at a faster rate than the influx of socially and economically disadvantaged people into the high risk areas. There are many communities in the world in



similar situations.

5. Flood risk reduction in informal settlements

Complete success of flood risk reduction measures in informal settlements within urban areas is unlikely to be achieved because of the very high exposure to flood risks, as well as limitations of manpower and other resources available to deal with the resulting emergencies. An unpalatable fact is that after a flood the failures such as loss of life can easily be measured, but successes cannot.

The ideal solution in an urban area would be to design and build all drainage systems to provide a high degree of safety, and to prohibit residential occupation or other activity in areas where risks cannot be avoided. This solution is not economically feasible as far as the structures are concerned and socio-politically intractable as far as the unplanned occupation of flood plains is concerned.

There are five options available for reducing the risk of loss of life and possessions of people living in flood prone unplanned settlement areas. The following comments summarize the advantages and disadvantages of each option; the information required for decision making; and the technology required for its implementation.

Option 1 - Do nothing

The option to do nothing and let nature take its course is the default option. There are many reports from developed as well as developing countries which cite the lack of political will to take unpopular decisions which incur additional costs that produce no visible benefits. The advantages are minimal cost and (assumed) avoidance of the legal consequences of direct action on the basis that residents in flood prone areas are there at their own risk. The disadvantages are the possible loss of life and possessions with resultant humanitarian, social and political consequences.

Option 2 - Apply measures to control occupation in flood prone areas

The prohibition of residential occupation below designated flood-lines and the imposition of building codes within flood-prone areas are standard practices in many local authorities throughout the world. These are the most effective options for reducing flood-related risks in urban areas. However, these measures have become unenforceable in many developing countries where there has been uncontrollable migration from rural to urban areas. There are many reasons for this migration – most of them poverty related. The obvious solution is to encourage occupants in the danger areas to move to safer areas, but this is often impractical in the short term. The main disadvantage is that the danger areas may be re-occupied by others.

Information required for decision making is whether or not alternative ground is available. Will the people go there? Can re-occupation by others be prevented? What are the costs of preparing the new area? What are the relocation costs?

Option 3 - Structural measures

The purpose of structural measures is to reduce flood peaks (flood control dams), or protect areas from inundation (flood levees), or reduce flood levels (canalization). The advantages of structural measures are that they can provide effective protection against minor floods. The disadvantages are the high cost and false sense of security as it is



always possible that a flood exceeding the design flood may occur. In general, the larger the flood, the less effective the structural flood protection measure is likely to be. The information required for decision making is mainly the availability of suitable sites and finance. The technology required for implementation is an advanced knowledge of flood hydrology, river hydraulics and structural design.

Option 4 - Develop flood warning systems

The operation of flood warning systems is the most efficient method for reducing the risk of loss of life where the unplanned occupation of flood prone areas has taken place, and legislation prohibiting residential occupation in these areas has not been enforced.

There are several important pre-conditions for any flood warning system. All people within the flood prone areas must routinely be made aware of the danger so that they will react immediately when warnings are issued. It must be physically possible to relay warnings timorously to all people at risk. A continuously manned operations centre must be available so that trained staff can receive and interpret weather and flood related information and take appropriate action should flood situations develop. The technology required for implementation includes a high degree of computer-based communications technology together with a sound knowledge of flood hydrology and river hydraulics.

The disadvantages of flood warning systems are that even where efficient systems are in operation, there will be occasions when flood warnings are issued and no damaging floods occur, or conversely damaging floods may occur without warnings being issued. These could result in loss of confidence in the flood warning system and possible claims for compensation. An ineffective flood warning system is worse than no system at all.

The information required for decision making includes the availability of a manned operations facility, technical expertise and financing. An adequate knowledge of flood hydrology and river hydraulics is required for the location of designated flood-lines. Questions that have to be addressed include: can residents be warned in time, and will residents have confidence in the warnings and in the authority that issues them?

Option 5 - Develop community river watch systems

There are many situations within and outside the jurisdiction of local authorities where efficient flood warning systems are impractical for financial or logistical reasons. In these situations the only feasible solution is to provide facilities and knowledge to local communities so that they can operate their own river watch systems.

The purpose of a river watch system is to make residents within flood prone areas aware of the danger so that they can take appropriate action should floods occur. They will have to familiarize themselves with the location of safe escape routes, and gathering places where they can temporarily keep their possessions until the river subsides. The flood awareness program could include the dissemination of regular newsletters, marking previous flood levels on beacons, posts, telephone poles, bridges, etc, or including floodlines on title deed plans.

The advantages of a river watch system are that it is an efficient system in small communities, and requires minimum installation and operation costs. The disadvantages are that it is only effective where residents are literate and have an appreciation of flood risks. Residents have no means of obtaining prior warnings of heavy rainfall within the



catchment or upstream river flow. Communities usually have no experience of floods and consequently the need for a river watch system. Communities may lose interest after a long period during which no warnings are necessary. Adequate knowledge must be available to assist communities to develop their own systems. The information required for decision making includes locating occupied flood prone areas, and determining the flood risks within these areas.



Disaster Risk Management and Livelihoods

- Livelihoods are a key area in strengthening local people's capacity to cope with disasters.
- Livelihoods are built on five types of resources, which includes human resources, social resources, natural resources, physical resources and financial resources;
- Disasters can disrupt the social mechanisms of livelihoods including production, exchanges, endowment, entitlement, claims and access.
- Livelihoods strategies and activities are also influenced by the location, since the nature of building blocks or resources is determined by their geographical location e.g. mountainous regions / upland areas, low-land areas / plains and coastal areas.
- The resources of people are determined by the structures and processes operating in a society, which provides or deny access to resources on the basis of people's class, caste, gender, education, religion or ethnicity.
- Development agencies and governments can provide direct and indirect support for strengthening people's resources to increase their choices and opportunities for better livelihood options.
- Livelihood activities of the poor largely remain invisible. That is why the official disaster assessment reports do not incorporate them in case of losses due to any natural or man-made disaster.

- 1- It is assumed that the rich people are better able to avoid disasters and to recover from losses and damages, if they are hit by disasters. There losses although may be more in absolute terms, but they suffer less damages in relative terms in comparison to the poor. Thus in order to enhance poor people's capacity to cope with disasters, it is imperative to strengthen their livelihoods. A change in the structures and processes those shape people's livelihoods are essential for providing people with better livelihood options.
- 2- Various studies on disasters and livelihoods have observed that families with more material and social resources often recover quickly from disaster affects as compared to those having less or minimum means of living.
- 3- A livelihood is sustainable when it has the potential to cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets for the time being and in future.
- 4- Livelihood options are the set of opportunities, choices, strategies and activities that are available to individuals and families from which they can select their means of living.
- 5- Reduced vulnerability, more income generating opportunities, increased well-being, improved food security and a sustainable use of natural resource base are essential components to achieve positive livelihood outcomes.
- 6- **Types of Resources:** As pointed out in the key concepts, there are five core resource categories upon which livelihoods are built. These include following:
 - **Human Resources:** Human resources are building blocks or means to achieve livelihood outcomes. However, accumulation of human resources can also be an end in itself. Many people regard



deteriorating health conditions and lack of education as core dimensions of poverty. Diverse human capital enables at-risk communities to devise different livelihood strategies in order to cope with natural or man-made hazards and to achieve livelihood outcomes. Human capital is important because it makes people capable of using other four types of resources effectively for positive livelihood outcomes.

Human Resource	
1- Direct Support to Asset Accumulation	<ul style="list-style-type: none"> ■ Provision of health / education training infrastructure ■ Support for training personnel ■ Development of relevant knowledge and skills
2- Indirect Support through Transforming Structures and Processes	<ul style="list-style-type: none"> ■ Reform of training policies and organizations
3- Feedback from Achievements of Livelihood outcomes	<ul style="list-style-type: none"> ■ Health status is directly related to income / food security ■ Higher income is often reinvested in education

- **Social Resources:** These resources are developed through:
 - Horizontal or vertical networks of people that increases mutual trust with a spirit of working together for having access to institutional circles and structures such as political or civic bodies;
 - Formal membership of community based organizations / associations etc.

Social resources can help increase people's income and rates of saving by improving the efficiency of economic relations on the basis of mutual trust and working together. Networks facilitate innovations, and knowledge development and sharing. This reflects the state of close relationship between social and human resources.
- **Natural Resources:** Natural resource base refers to the natural stocks that generate resources and useful services for livelihoods. Services that can be derived from natural resources include;
 - Land
 - Forests
 - Marine / wild resources
 - Water
 - Air quality
 - Erosion protection
 - Waste assimilation
 - Storm protection
 - Bio-diversity



Natural resources and disasters are closely associated with each other. Natural disasters such as cyclones, earthquakes etc. are the outcomes of natural processes that destroy natural resources and devastate people's livelihoods.

The vulnerable and resource-poor people largely derive their means of livelihoods from the natural resource base (farming, fishing, mineral extraction etc.). That is why their survival remains at risk without the protection and conservation of natural resources. For example, health will deteriorate where air quality is poor as a result of polluted industrial activities or natural disasters. People's health and well being depend upon the continued functioning of complex ecosystems.

- **Physical Resources:** Physical resources are a fundamental need to support livelihoods. Lack of particular types of infrastructure can be core dimension of poverty. The opportunity costs associated with poor infrastructure can preclude education, access to health services and income generation. For example, farmers will have difficulty in bringing their agriculture produce to the market if they are not provided with road infrastructure.

Following components of infrastructure are believed to be essential for sustainable livelihoods;

- Affordable transport
 - Adequate shelters and safe buildings
 - Adequate water supply and sanitation
 - Affordable energy
 - Access to information
- **Financial Resources:** To achieve sustainable livelihoods objectives, following are the major sources of financial resources:
 - Savings are the preferred type of financial resources since they do not have liabilities attached and usually do not entail reliance on others. Such forms include cash, bank deposits or liquid assets (livestock and jewelry etc.)
 - Reliable mechanisms of pensions, remittances, and / or other transfers from the state are some common inflows that positively contribute to financial resources.



Public Awareness in Disaster Risk Management

- Public awareness as a disaster reduction measure aims to increase the community's knowledge about disaster risks and practical preparedness and mitigation measures, including warning signals.
- Essential features of an effective public awareness program are the following: ongoing and sustained process; active community participation from design to implementation; hazard- and community-specific; integrated in the local warning and response system.

What is Public Awareness?

- The process by which vulnerable populations understand the nature of hazards and their potential for causing disasters (ADPC)
- A systematic distribution of information about potential hazards and threats and that people can do about them, in order to encourage people to act to protect their lives and property. (CDRC)
- The process through which people living in hazard-prone areas come to realize and understand that they live in areas of risks, know the specific dangers that they are exposed to and the warnings that are issued, and know the appropriate actions to be taken to protect their lives and minimize property damage. (ADPC)
- Education successfully communicated to the public. (CDRC)

Objectives of public awareness

- To increase the public knowledge about hazards, their nature and the possible consequences of their impact
- To increase knowledge about practical preparedness measures
- To inform the public about the warning system that will be employed and what they should do when they receive it
- To increase knowledge on how to respond to an emergency situation
- To mobilize support for disaster risk reduction plans or response activities



Elements of Public Awareness

1. Purpose

- - Message
- - Means
- - Audience
- - Intended result

2. Structure

- - Has long term and repetitive approach
- - Is consistent
- - Utilizes a wide variety of methods and media

Key Features of Public Awareness

- On-going Process - Public awareness is an on-going process, not simply a set of products such as posters, brochures, etc.
- Participatory - Target population are active participants in program design and implementation phases, in partnership with individuals having the necessary technical skills.
- Community Specific - An assessment of specific hazards is the essential basis for developing public awareness programs.
- Target Population Specific - Must be based on need of specific user groups for information, which are essential to them (women, children, and indigenous people).
- Integral Part of Local Warning and Response System

Steps in Setting-up a Public Awareness Program

1. Establish the need

- What do people know about the hazards they are prone to?
- What do they do to prepare for such hazards? Are these adequate?
- Do people understand the meaning of warnings and what they should do when they hear these?



2. Planning the Program

- Define without bias how people will behave before the hazard impact, during the impact and after the impact.
- Define the critical elements of the program.
- Who should be informed? Who are the most vulnerable? What are their habits, preferences, what is the common means through which they get information?
- What type of hazard, potential effects?
- Who will be involved in the implementation?
- How can it promote self-reliance and uphold sound indigenous practices?
- How can results be sustained?

3. Resource Mobilization

- List down resources needed and sources

4. Implementation

5. Evaluation

6. Improvement of the program

Critical factors for Effective Communication

- **Credibility** -The recipient must have confidence in the source and this may involve building a climate of trust between the sender and receiver
- **Context** - Must form part of the normal environment of the receiver to enable them to relate to the information. **Make the materials as locally specific as possible.** People are more likely to take action if they come to understand that they are personally at risk.
- **Content** - Must have meaning for the receiver; it must be compatible with his value system and relevant to the problem. Relate the facts about hazards to human experience rather than solely relying on statistics. Suggest specific actions that can be taken to reduce losses and highlight the benefit of such actions.



- **Clarity - Must be in simple terms; the further it travels, the simpler it should be. Keep the material simple to ensure that essential facts are easily understood**
- **Continuity and Consistency - Message should be repeated and should be consistent with one another. Repeat the reinforced message in a continuing rather than in a single awareness effort. Use various means of conveying the same message to sustain interest.**
- **Channels - Established channels of communication should be utilized particularly channels that are used and respected by the audience.**
- **Capability - Must take into account such factors as the receiver's habit, degree of literacy and knowledge of the world. Make certain that materials are in a language, which target audience understands.**
 - **Creativity - Must be in form that will take interest of audience. Use pictures or graphic descriptions or earlier losses or people's action, which save them.**

What the Community/Organizations can do to promote Public Awareness

- - Community Meetings
- - Community discussion groups
- - Wall sheets, posters, newsletters
- - Plays
- - Leaflets, manuals, handbooks, brochures, books, comics
- - Forum
- - Press releases national or local newspaper, radio or television
- - Transparencies, slide presentations, film, photos for exhibit
- - Public speeches, letters to the editors, articles in the printed media
- - Radio program , etc...



Community Based Disaster Risk Management

1. Concept

Disaster risk management includes community based-disaster risk management in which at-risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks. This means that at-risk communities are at the heart of decision-making and implementation of disaster risk management activities in order to reduce their vulnerabilities and enhance their capacities. It is essential that the capacity of the community be built so that they are able to assess the risk, identify risk reduction measures and plan and implement these risk reduction measures. Risk reduction measures include those activities that will prevent disasters, mitigate hazards, and prepare the community to respond to crisis and emergencies.

The involvement of the most vulnerable is paramount and the support of the least vulnerable is necessary. In CBDRM, local and national governments are involved and supportive.

2. Aims of CBDRM

Disaster Risk Reduction

Achieve resilient communities and effective risk reduction, through the inclusion of a community based approach in government disaster risk management policy and strategy and through gender equality.

Sustainable Development and Poverty Reduction

Contribute to sustainable development and poverty reduction through development-oriented risk management strategies, achieved through strengthening community coping capacities.

People empowerment

Empower at-risk communities to deal with disaster risks by themselves, through building capacities of the most vulnerable and making the outside stakeholders accountable to the community.

Equity

Achieve equity in development gains through transforming community relations and structures.

3. Contribution of CBDRM to Sustainable Development and UN-Millennium Development Goals

Sustainable development was defined as, "meeting the needs of the present generations without compromising the ability of future generations to meet their needs" (Brundtland Commission). There are four essential aspects of sustainability: Social, Environmental, Economic and Institutional. Please refer to the table 1 to see the United Nations Millennium Development Goals (MDGs)

Community based disaster risk management is envisaged as an integral component of sustainable development, since it helps in avoiding the negative impacts of disasters on development. CBDRM can contribute to good sustainable development by:



- Reducing disaster impact to lives, assets and livelihoods through addressing hazards and building people's capability to continually pursue development goals. (MDG 7)
- Through promoting protection and rehabilitation of environmental resources, as an important mitigation strategy (MDG 7)
- Strengthening livelihood assets at household and community level, through sustained institutions and resource flows (MDG 1)
- Strengthening social capital, networks and organizations of people, and their interaction with the state and its services (MDG 8)
- Focusing state efforts on the most vulnerable and poor to address social inequalities, including inter-generational inequalities
- Protecting physical assets and infrastructure
- Utilizing financial resources effectively and efficiently
- Reducing poverty as a strategy to reduce vulnerability (MDG 1)
- Reducing mortality through building disaster resilient communities (MDG 4)
- Contributing to better sanitation, education, nutrition and food security (MDG 2 & 5).
- Promoting gender equality through building capacities of women and reducing their specific vulnerabilities to disaster risks (MDG 3).

Table 1: UN- Millennium Development Goals

Goal 1	Eradicate Extreme Poverty and hunger
Goal 2	Achieve universal primary education
Goal 3	Promote gender equality and empower women
Goal 4	Reduce child mortality
Goal 5	Improve maternal health
Goal 6	Combat HIV/AIDS, malaria and other diseases
Goal 7	Ensure environmental sustainability
Goal 8	Develop a global partnership for development



4. Key characteristics

A) Philosophy

- CBDRM contributes to addressing the root causes of vulnerabilities and to transforming or removing the structures generating inequity and underdevelopment.
- CBDRM is a development-oriented approach. The long-term goal of CBDRM is to promote sustainable development and this can be only achieved through integrating CBDRM in to the development practice in all sectors. It works best when it is integrated with structural and non-structural development planning.
- Living in disaster safer communities is considered a **basic human right**.
- Community knowledge, culture and customs are recognized and respected.

B) Actors

- CBDRM recognize the central role of vulnerable groups and persons. It means that people are given the opportunity to identify disaster risks, find solutions and make choices to build their own safer future. Therefore, a "bottom up" approach is considered as an essential part of disaster risk management.
- CBDRM is gender sensitive. It recognizes that men and women have different needs, different activities and different perception of risk and different priorities. Women's participation as disaster managers at all levels is integrated.
- There is a wide range of actors in CBDRM. It recognizes that since community based initiatives will usually require resources from outside the community, there is a need for broad, interdisciplinary, local to national and national to local interaction. The role of NGOs, government and civil society (faith groups, business, academe, and other professionals) is supportive.
- The role of media as an important stakeholder is recognized.

C) Nature of Stakeholder Relationships

- CBDRM requires a high level of coordination and cooperation amongst stakeholders, e.g. governments, donors, NGO's and vulnerable groups and people.
- CBDRM advocates and workers believe that they are accountable to the people first and foremost.
- There is a need to maintain efforts to enhance inclusiveness, decentralization and empowerment



D) Approach to Implementation

- It puts a premium on the organizational capacity of the vulnerable sector through the formation of grassroots disaster risk management organizations;
- The strategies of CBDRM are participatory in nature. These include participatory analysis, hazard mapping, vulnerability and capacity assessment, counter disaster planning, implementation and monitoring and evaluation.
- CBDRM is multi-faceted and highly adaptable. It is most effective when it is contextualized and adapted to match the social, political and cultural environment in specific locations at a specific point in time.
- It recognizes the need for continued innovation. The risk management related needs of communities in different cultural contexts and over time may change. Therefore, new strategies will always need to be invented to meet those needs.
- It provides an opportunity to share resources from different stakeholders and complement the limited resources of the governments.
- CBDRM contributes to *empowerment of community members, and can bring pride, dignity, self-confidence, a desire to learn more and a willingness to seek improvements.*

5. Monitoring and Evaluation in CBDRM

A) Definitions

Monitoring was defined as the continuous and periodic review and overseeing by all stakeholders managing an activity, to ensure that input deliveries, work schedules, target outputs, and other requirements are proceeding according to plan. Monitoring has two types.

- Process monitoring
- Effect Monitoring

Monitoring is done at various levels

- Community or field level
- Regional/district or local level
- Provincial level
- National/headquarter Level

Evaluation is an activity whereby the results and effects of a project are being assessed, to see to what extent the project objectives have been achieved. After a project has finished, an evaluation helps to find out whether the



project has been successful or not. Evaluation can be done as an internal review or as an external impact assessment. Evaluation is done on the following aspects.

- Impact on the beneficiaries
- Appropriateness regarding needs, duration/timing, customs and practice
- Efficiency and cost effectiveness
- Coverage: geographical, targeted vulnerable groups
- Sustainability
- Replicability of the activity
- Coherence
- Gender

B) Utilizing the Results

- Integration into planning procedures for future interventions
- Feedback and discussion for learning and growth
- Give feedback to other partners, government institutions
- Identify areas for improvement, to redefine project priorities and actions for next activity

C) Notes on Current Status in the Region

- Community is often involved in implementation, but not in monitoring and evaluation;
- Although baseline surveys are conducted at the project start up but impact indicators are not developed;
- Various organizations follow very different approaches on monitoring and evaluation;
- There is no common framework, guidelines and standards available on participatory monitoring and evaluation;
- It is not possible to develop common impact indicators for CBDRM monitoring and evaluation since situation in different communities varies;
- Current monitoring and evaluation practice focus more on assessing quantity rather than quality;
- Few NGOs are implementing participatory monitoring and evaluation;
- In the case of community based organizations, monitoring and evaluation is a built-in process, and it is not done explicitly.

D) Current Approaches and Methods

- Logical Framework Matrix/ observing the key result areas
- Strengths, weaknesses, opportunities and threats analysis (SWOT)
- External Evaluation
- Preliminary social investigations and analysis
- Field monitoring visits
- Participatory Rural Appraisal
- Family clustering
- Regular community meeting
- Case Story writing



- Periodic reviews
- Capacities and vulnerabilities analysis
- Regular record keeping
- Formal questionnaire survey
- Informal conversations
- Lesson learnt workshops

E) Process in Participatory M & E

People's participation is a must, as it enhances the integration and recognition of community knowledge and experiences, and ensures accurate and reliable data. Participatory approach makes sure that the project beneficiaries carry out monitoring and evaluation. The information gathered is aimed at helping people to analyze and interpret their own progress, to help identify and anticipate problems and to plan their own steps to avoid or solve these problems. In the participatory monitoring system, information flows between all the people involved: the community, the government, donors, NGOs.

- Form a Program Coordination Team of all stakeholders (including beneficiaries, implementing organization/s, government, donors and others) to develop, implement and monitor and evaluate the program activities.
- Develop impact indicators to meet the requirements of all stakeholders
- Define roles and responsibilities of all stakeholders in M & E
- Jointly conduct data-collection, analysis and review of agreed impact indicators, achievements and activities implemented
- Present the findings and analysis of M & E process to partners from various levels for validation
- Finalize the evaluation report and disseminate to partners

Participatory Monitoring and Evaluation Approach Enhance:

- Joint responsibility
- Capacity of partners in program management
- Accountability to partners and to beneficiaries
- Ownership amongst partners and beneficiaries
- Learning and reflection
- Attitudinal change
- Customization of program strategies to local conditions

F) Strategies to Promote Participatory M & E

- Develop M & E framework for CBDRM, based on country context
- Develop general areas of impact indicators, performance indicators and qualitative indicators
- Raise awareness on the need for participatory monitoring & evaluation
- Build capacity of government, community and other actors on P M & E
- Build Monitoring and Evaluation into initial planning process
- Form multi-stakeholder program management teams to implement P M & E



- Conduct baseline survey before the project start and develop community specific impact indicators with the participation of beneficiaries
- Acclimatize monitoring and evaluation scheme with the community socio-economic calendars to encourage more participation
- Develop writing and note taking skills of community members and instill the habit and discipline of record keeping
- Integrate properly in local government's planning on community sustainable development strategy
- Design an effective feedback and review mechanism
- Ensure social, organizational and institutional learning
- Analyze why people do not participate, and how their behavior and attitudes could be changed to encourage participation.

G) Examples of Indicators

Impact indicators

- Reduce number of casualty
- Improve the quality of life (agriculture, health, resiliency)
- Ensure Safer communities
- Strengthen livelihoods security

Process

- Ensure 'real' participation
- Enable community focused leadership
- Focus on strengthening community linkages (Break down dividers)
- Proactive focus on risk reduction



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October 5 – 10, 2009 Islamabad



Disaster Risk Management Planning at District Level

Module – 4



Overview of Preparedness Planning

1. The Nature of Preparedness

Preparedness is inter-related with so many other aspects of disaster risk management. In fact, it can almost be said that every aspect of disaster risk management affects, or is affected by preparedness. There is, however, another significant factor which concerns preparedness. This is its different nature when compared with prevention/mitigation. Measures of prevention/mitigation tend to be geared to major policy decisions at government level; also they are usually directed primarily from senior management levels. Preparedness measures, however, tend to be more strongly oriented towards action by individual organizations. The fact that, generally speaking, significant numbers of organizations are involved in preparedness emphasizes that there is a more critical requirement for coordination than may be the case with prevention/mitigation.

2. Preparedness Needs

The maintenance of effective disaster preparedness is a dynamic requirement. Left to itself, preparedness will quickly fade away, even to the point of becoming virtually non-existent. This chapter therefore presents a summary of many different aspects which affect preparedness.

National Disaster Risk Policy

There is need for a clear and comprehensive national disaster risk policy which covers all aspects of disaster risk management and which ensures that preparedness is given proper consideration and priority.

Disaster Risk Legislation

Special disaster legislation may be necessary to ensure that preparedness aspects of national policy are adequately covered and implemented. In some countries this has been found necessary, especially to ensure that preparedness measures exist in the private sector and/or within communities.

Organizational Structure

There also needs to be a clear and workable organizational structure, so that levels of disaster preparedness are identified. Disaster legislation helps to formalize this aspect. There is also need within the organizational structure for some form of national disaster risk management section or office.

National Disaster Risk Management Section (or Office)

In relation to preparedness, some form of national disaster risk management section or office is vitally important. There needs to be a continuous process of monitoring applied to the wide range of necessary preparedness activities. This can be done most effectively by a specialist section.

Assessment of Preparedness Actions

Adequate arrangements for identifying, assessing and monitoring the disaster threat are also necessary. In turn, this enables a reasonable forecast to be made of the likely effects arising from disasters. Preparedness is vitally concerned with these effects, because they constitute the actual circumstances, events and problems against which preparations need to be made. Usually, these effects are many and varied. For example, they include:



- casualties,
- damage to and destruction of property,
- damage to subsistence and cash crops,
- disruption of services,
- damage to national infrastructure,
- economic loss,
- loss of livelihood.

Therefore, preparedness measures to deal with these effects need to be determined and put in place before disaster strikes.

Planning Framework

If preparedness measures are to be fully effective, they need to be clearly set out in appropriate plans. Such plans usually need to apply at national, provincial/regional and local government and community levels. If preparedness measures are set within this planning framework, responsibilities for them can be clearly an officially defined. This also helps to ensure that the measures can be systematically monitored and kept up-to-date.

The production of effective counter-disaster plans usually involves considerable negotiation with resource organizations (e.g. government departments, non-government organizations), especially to ensure that their capability is utilized to the maximum extent. This is important because, especially in severe disaster circumstances, the total capability of these organizations is needed to deal with the many operational tasks which arise.

Utilization of Resources

If available resources are to be utilized to optimum effect, there must be:

- An accurate and up-to-date inventory of all available resource organizations (e.g. government departments, non-government organizations, potential international assistance agencies).
- Clear allocation of the roles and responsibilities which resource organizations are required to undertake during response operations and, where necessary, during the recovery phase.
- Suitable preparedness arrangements within resource organizations ensure that they are able to fulfill their roles when required. It is advisable that their preparedness arrangements should follow common guidelines and, advisedly, these guidelines should be issued by the national disaster management section as part of the general planning process.
- It is also desirable that the capability of resource organizations should be monitored, as appropriate, in order to ensure the operational roles can be fulfilled. This can usually be done by the organizations themselves but, if necessary, assistance can be provided from the national disaster risk management section.
- Consideration should also be given to preparedness measures necessary for the reception and utilization of international resource. These might include arrangements for reception, storage and distribution of relief commodities; utilization of assistance teams (e.g. rescue workers, medical personnel, technical teams); fly-in and turn-round of assistance aircraft, including refueling and similar arrangements; port handling facilities for visiting sea transport.



Coordination of Effort

Disaster preparedness (and the response operations to which preparedness essentially applies) involves a wide range of activities and organizations. If these activities are to be successfully carried out by the organizations concerned, there clearly needs to be a system for achieving coordinated effort.

This system is usually provided through the organizational framework. For instance, a provincial disaster committee would normally co-ordinate activities within its area of responsibility. However, additional coordinating responsibilities may be designated to organizations or individuals, if deemed necessary.

Arrangements to achieve successful co-ordination of effort must obviously be made, as a part of preparedness, before disaster impact.

Operational Facilities and Systems

Adequate preparedness of the various facilities and systems which are required for response operations is also most important. Such facilities and systems usually include:

- emergency or stand-by communications;
- a warning system, including provision of warning and information to the general public;
- a system for activating the organizational structure and its resource organizations (usually by designating stages such as Alert, Stand-by and Action);
- emergency operations centers (which form the focal points of information management);
- a system for damage survey and assessment of needs;
- emergency relief arrangements (for food, shelter materials, medical assistance)

Equipment and Supplies

If stockpiles of emergency equipment and supplies are held, these need appropriate surveillance to ensure their serviceability and ready availability. Emergency equipment needs to be held at the levels where it will be primarily used (e.g. equipment for local self-help teams, such as picks and shovels, needs to be held at community level). Sometimes safe storage (and thus ready availability) poses some problems. However, these can usually be overcome locally. In one case the village schoolmaster was made responsible for storing and maintaining emergency stocks and school children had a part in checking and accounting for them.

When there is a possibility that equipment and supplies from the private sector may need to be co-opted or requisitioned, preparedness arrangements for this eventuality need to be maintained.

Training

Training is obviously a most important component in preparedness. If possible, a permanent training system and program is desirable. This should cover not only the needs of government officials but also those of non-government organizations. In addition, training is required for persons (such as volunteers from within the community) who may fulfill or assist in disaster management roles during times of emergency. Exercises, designed to test the disaster management system or parts of it, provide valuable preparedness needs. In training, as with so many other aspects, the existence of a permanent disaster management section or office is invaluable.



Public Awareness and Education

An aware, alert and informed public is a most valuable asset for preparedness. Public awareness programs can be presented in a variety of forms, to suit particular circumstances. Events such as a National Disaster Preparedness Day are helpful in promoting and sustaining public awareness. Inclusion of disaster awareness in school programs usually has long-term value.

Effects of Crisis Pressure

Disaster impact usually imposes various forms of crisis pressure on organizations and individuals who have to deal with the problems caused. It is difficult to simulate this crisis pressure in exercises or tests. Therefore, in formulating preparedness measures, it is advisable to take account of crisis pressure and, where possible, to try to compensate for it. This might be done by earmarking additional stand-by personnel, arranging for mobility in switching resources from one area to another, or similar measures.

3. Maintenance of Preparedness Levels

The maintenance of effective levels of preparedness is a major problem, especially because preparedness will tend to fade away if left to itself. Certain activities and arrangements help to maintain the viability of disaster plans. These are summarized below:

- Training activities
- Exercises and tests
- Functional and readiness checks
- Post-disaster review
- Use of regulations
- International assistance liaison
- Public awareness activity
- Publicity
- Education in schools

However, there are usually two particularly key areas which, in most countries, can significantly influence preparedness levels. These are:

- The lead given by the main national disaster risk management authority (e.g. the National Disaster Council or its equivalent).
- Astute utilization of the outreach capability possessed by most of those non-government organizations which have a disaster-related capability and role.

In many countries, particularly over recent years, non-government organizations (NGOs) have played an increasingly prominent role in disaster risk management, especially in preparedness and response. Many governments have realized that, because of restrictions in their own resources, it is beneficial and effective to make optimum use of the religious and welfare organizations which comprise the majority of disaster-related NGOs, because these have a very strong out-reach and contact capability as far as the general public is concerned. In addition, NGOs of this type have



strong links internationally. It follows that these two capabilities of out-reach strength and international linking provide an excellent basis for promoting community awareness and preparedness.

Linking and programming can be achieved between the official disaster risk management leadership and the ongoing activities of NGOs, there is every prospect of developing and maintaining good standards of preparedness.

Funding

Whereas the financial requirements of prevention and mitigation are largely self-evident, this aspect is sometimes overlooked with preparedness. Effective preparedness programs do require adequate budgetary support and, for this purpose, international assistance can often be obtained (e.g. for training, communications, warning systems).

Warning Aspects

Warning has sometimes been described as the critical "hinge factor" in disaster risk management. In other words, it provides the vital link between preparedness measures and response action. From a preparedness viewpoint, therefore, the following aspects are of key importance:

- The Warning system, and its associated procedures, must be clearly defined and written down in plans, standard operating procedures and all other relevant documents.
- The warning system must be known to and understood by all key government, Ministers, disaster risk management organizations and officials, other relevant persons and the general public.
- The system must possess the capability for:
 - Receiving international warning
 - Initiating in-country warning, and
 - Issuing warning at national and other governmental levels, and at community level
- The system must also include back-up measures, in case its primary components fail or are damaged
- Intended recipients of warning (e.g. key persons and organizations and the general public) must possess the means of receiving the warning and must know what action should be taken.
- All facilities and arrangements relevant to warning and the warning system (e.g. evacuation arrangements, shelters and safe havens) must be in an appropriate state of readiness to react to warning.
- Arrangements for activation and mobilization of resources must be in place in order to make maximum possible use of any warning period.
- All plans and arrangements for disaster response must make provision for no-warning situations (e.g. for an earthquake or volcanic eruption where no prior warning indicators have occurred).
- The warning system and /or component parts of it must be tested and practiced periodically if it is to function satisfactorily when needed.



Early Warning

- Early warning means the transmission and effective / timely dissemination of the message about any imminent danger that enables communities for taking preventive measures to avoid or reduce the possible losses of the danger.
- An effective early warning is necessarily hazard and audience-specific that gives advice to the people for possible actions in advance, and the consequences of not taking appropriate measures.

The early warning is given to disaster prone communities to inform them about the looming hazard, the risks involved and elements at risk, environment, and potential needs for them.

The warning usually advises on the following issues:

- Means of protection (for instance, warning on contamination of water sources either from natural or human made activities)
- Means of preparedness (for instance, severe weather forecast / warning, preventive evacuation etc.)
- Means of mitigation (for instance, sandbagging to reinforce the dike / embankment)
- Means of response to threat (for instance, warning that the floodwater is about to hit the dike and cause breach; that the communities need to reinforce the dike through sandbags or other available means)

The early warning message also instructs on "what, when, how, who, and where" to help people effectively deploy their resources.

Different forms of giving / receiving warnings:

- Community meetings
- Notices / posters
- Verbal or pictorial messages
- Radio
- Community-based newspapers
- TV



- Other indigenous means

Inform people about different phases of the warning and its meanings; give update of the forecast through symbols or sounds that are understandable to locals.

For larger dissemination of the message / warning updates, "Information Boards" can be placed at various important locations such as:

- Schools or government buildings
- Stores / bazaars
- Bus / wagon stands
- High-raised places of a particular community
- Outside mosques / churches / other religious places

Formation of village level committees: With the assistance of government departments and NGOs, an information committee may be constituted for dissemination of information pertaining to warning / forecast or the monitoring of natural or man-made hazards. The committee can further assign primary and secondary roles and responsibilities to individuals and groups.

Warning Template

"Based on the latest warning received from the Met Department, floodwaters are expected to reach our area within next 24 hours, which would flow through the main village settlement and surrounding localities. According to the Met Department, this is going to be the severe flood as compared to the last one, which destroyed houses and crops, and killed animals.

Therefore, all residents of the area are advised to evacuate to their designated evacuation centers. Please bring food, cooking utensils, bed-sheets and water and other valuables that are likely to be damaged by the floodwaters.

We have three hours to prepare before our organized evacuation. After necessary preparations, please proceed to the place where vehicles are waiting to pick all of us for evacuation centers.

It is estimated that the floodwater would recede within three days, and we would be able to get back to our homes on July 5.



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Emergency Response Management

Module – 5



Emergency Response Management

1. Important characteristics of Response

Effective response to the impact of disaster is critical, mainly in order to:

- Limit casualties,
- Alleviate hardship and suffering,
- Restore essential life support and community systems,
- Mitigate further damage and loss, and
- Provide the foundation for subsequent recovery.

There are certain characteristics which typically apply to response effort. They include the following:

Type of disaster

Depending on its type, the onset of disaster may provide long warning or no warning to all. This will obviously influence the effectiveness of activation, mobilization and application of response effort.

Severity and extent of disaster

This represents the size and shape of the response problem and particularly affects aspects such as:

- The ability of response effort to cope with the problem;
- The urgency of response action and the priorities which are applied;
- Exacerbation of disaster effects if appropriate action is not taken;
- Requirements for external assistance.

The ability to take pre-impact action

If warning time and other conditions permit pre-impact action to be taken (in the form of evacuation, shelter and other protective measures), this have a major effect on the success of response overall.

The capability for sustained operations

A frequent requirement of response operations is that they must be sustained over a long enough period to be fully effective. Several factors are involved here, including:

- Resource capacity,
- Management,
- Community self-reliance,
- International assistance.

However, the capability to sustain operations, relative potential threat, is a disaster management objective which needs to be carefully addressed both during preparedness and response action itself.

Identification of likely response requirements

An important characteristic of response is that it is generally possible to identify beforehand the kind of response action which is likely to be needed for any particular disaster. As indicated earlier the disaster threat, the effects likely



to emanate from individual disasters are well established. Thus, the required response actions are also identifiable. This represents a considerable advantage in emergency response terms, in that it is possible to plan and prepare for well-defined response action in the face of potential threats. This, again, constitutes a tangible objective for management of emergency response. The assessment of response needs in the light of the foregoing and similar factors has useful application to most circumstances.

2. Requirements for Effective Response

Wide international experience has shown that effective response depends fundamentally on two factors;

- Information, and
- Resources

Without these two vital components, the best plans, management arrangements and expert staff become virtually useless. Bearing this fundamental premise in mind, the major requirements for effective response are summarized below.

General background of preparedness

The effectiveness of response operations will depend vitally on the general background of preparedness which applies. This includes various aspects of policy direction, planning, organization and training.

Readiness of resource organizations

The readiness of resource organizations (both government and non-government) to respond to disaster situations, often at very short notice, is a very important requirement for response operations. Sometimes, failure on the part of only one designed organization may seriously upset the total response effort. However, disaster management authorities do need to bear in mind that the response lead-time for resource organizations can differ markedly.

Warning

As has been emphasized earlier, an effective system of warning is vitally important for successful response operations; even though there are bound to be some occasions when little or no warning will be available. The main needs for warning are:

- Initial detection, as early as possible, of the likelihood that a disaster will occur.
- Origination of the warning process as early as practicable, bearing in mind false or unnecessary warning needs to be avoided. In this regard, however, precautions can be built into the warning sequence by ensuring that, where doubt exists, only key officials are initially informed.
- Effective means of transmitting warning information.
- Facilities to receive and assess warning information.
- Response decisions, as a result of assessing warning information.
- Dissemination of response decisions and, as appropriate, broadcast of warning information to the public.

Preliminary reaction to warning, before a disaster actually strikes, can save lives and property. This preliminary reaction might include:



- Closing of schools, offices and other public places,
- Checking emergency power supplies and similar facilities,
- Taking precautions in households to ensure supplies of food and drinking water.

It is re-emphasized that preliminary reaction of this kind should be planned beforehand and, where necessary, the relevant information should be passed to disaster related organizations and the public.

The evacuation of communities, groups or individuals is a frequent requirement during response operations, evacuation is usually:

- Precautionary (in most cases undertaken on warning indicators, prior to impact, in order to protect disaster-threatened persons from the full effects of the disaster)
- Post-impact (in order to move persons from a disaster-stricken area into safer, better surroundings and conditions).

The question of evacuation is a complex one which involves a wide range of factors.

Activation of the response system

For rapid and effective response, there usually needs to be a system for activating emergency response officials and resource organizations. It is useful to implement activation in stages. These might be alert, stand-by and action. The benefit of this arrangement is that if, after the initial warning, the disaster does not materialize, activation can be called off. Thus, full mobilization of resources can be avoided and the minimum of disruption is caused to normal life. It is advisable for government departments and other resource organizations to work to this system of stages in their own internal plans.

Co-ordination of response operations

Co-ordination of the action taken in response operations is very important. Good co-ordination ensures that resource organizations are utilized to best effect, therefore avoiding gaps or duplication in operational tasks.

Appropriate emergency coordination centers are essential for achieving effective co-ordination, because the ECC system is designed to facilitate information management and accurate decision making.

Also, appropriate disaster risk management committees (usually at national, intermediate, local government and community levels) are necessary, in order to ensure that, as far as possible, there is overall co-ordination in decision making and in the allocation of tasks.

Communication

As with all aspects of disaster risk management, good communications are essential for effective response. Also, since communications may be adversely affected by disaster impact, reserve communications (with their own power supplies) are a necessary part of response arrangements. The value of solar-powered communications, essentially under severe disaster conditions, can be considerable.



Survey and assessment

It is virtually impossible to carry out effective response operations without accurate survey of damage, and consequent assessment of relief and other needs. To be fully effective, survey and assessment needs to be carefully planned and organized beforehand. It usually calls for:

- Survey from the air,
- Survey by field teams,
- Accurate reporting from emergency response and other official authorities in or near the disaster area.

A general survey needs to be made as early as possible after impact, with follow-up surveys as necessary. Some training is usually required for personnel who are required to carry out survey and assessment duties. This is necessary in order to ensure the accuracy of collected information. The information gathered through survey and assessment is, of course, vitally important for the implementation of immediate relief measures. However, it should also be noted that much of the information is also required for the formulation of recovery programs.

Information Management

In the confused circumstances which tend to exist following disaster impact, it is not easy to obtain accurate and complete information. However, without accurate and comprehensive information, it is difficult to ensure that response operations are focused upon the correct tasks, in the right order of priority.

Emergency coordination centers are essential for effective information management. Especially, ECCs ensure that information is correctly processed according to the proven cycle of:

- Acquisition of information,
- Information assessment,
- Decision making,
- Dissemination of decision and information.

Therefore, even if there are limitations in obtaining information, the ECC system will make the best use of what is available.

Allocation of tasks

Through proper preparedness planning majority of response tasks can be designated beforehand to appropriate government departments and other response organizations. For example

- Public works department to undertake debris clearance tasks.
- Medical and health department to implement health and sanitation measures.
- Police to maintain law and order, and to assist with control of people and vehicles around the disaster area.
- Red Cross to carry out first aid and other emergency welfare assistance.



The emergency response authority may need to give especial attention to tasks such as emergency feeding and emergency shelter programs, which are not covered in the day to day responsibility of government departments and other organizations.

Priorities for the implementation of response tasks are usually decided by the appropriate level of disaster committee. These priorities may have to be changed frequently and both emergency response authorities and resource organizations need to be capable of accepting and implementing such changes.

Availability of relief supplies and committees

The ready availability of relief supplies and commodities is an important factor in effective response. After disaster impact, there is usually an urgent need to provide and distribute:

- Food,
- Drinking water,
- Clothing,
- Shelter materials,
- Medical supplies and assistance.

Emergency response action therefore needs to cover two main areas

- Obtaining the various commodities from government stores, emergency stockpiles, commercial supplies and international assistance sources; and
- Organizing the distribution of these commodities according to the best possible orders of priority.

International Assistance Resources

International assistance resources often play a valuable part in response operations. These resources mainly comprise relief commodities, especially food, shelter and medical supplies. However, specialist personnel and equipments are also available for damage survey and similar tasks. Emergency management authorities responsible for response operations should also bear in mind that some international agencies and some countries hold stockpiles of relief supplies conveniently situated around the World. Access to such stockpiles may be extremely valuable in times of urgent need.

Public Co-ordination

Good coordination between the emergency response authorities and the public is essential if response operations are to be successful. The foundation of such cooperation should be laid during the public awareness programs as part of preparedness. However, emergency response and coordinating authorities should remember that the affected public needs to be kept informed. This particularly applies to intended response action and the timing of relief supplies. If the affected public is not kept, as fully informed as possible, rumors and false reports are likely to be started, thus causing problems of co-operation for the response authorities.

Media Cooperation

Disaster, especially major disaster, is news. Consequently, requirements for information by local and international media are inevitable. Thus, it is clearly advisable to have well-organized arrangements to deal with this aspect. It is



important that conditions in the affected country should be accurately reported internationally and that there is no misreporting. Therefore, to avoid possible misunderstandings and misrepresentations, it is important to give appropriate briefing and information to media representatives about disaster impact. Delays may lead to some media representatives making their own news, which may not be in the best interests of the country. Good relations with the local media are also important and usually two-way benefits are involved. Not only do the local media benefit from good cooperation from the disaster risk management authority, but they can also perform valuable services such as warning and public awareness.

It is recognized that during pressurized response operations, disaster management authorities may regard media information as having to take a low priority. However, this should be avoided.

3. Major emergency response aspects

Following the impact of disaster, there are usually varying degree of damage to the systems which support everyday life. Communities therefore need help urgently in order to subsist through the emergency phase and beyond. Key aspects of this assistance include:

Response

To rescue persons who may be trapped in buildings and under debris, isolated by flood waters, or need rescuing for any other reason.

Treatment and care of victims

To dispose of the dead.

To render first aid.

To ensure identification tagging of casualties.

To ensure needs in term of medical treatment, hospitalization and medical evacuation; or whether such a requirements is likely to arise later.

Shelter

To provide shelter for victims whose housing has been destroyed or rendered unusable. This may involve:

Making urgent repairs to some housing,

Issuing tents and/or tarpaulins to provide means of temporary shelter,

Accommodating groups of homeless people in community building such as schools.

Food

To organize and distribute food to disaster victims and also emergency workers.

To estimate damage to food and food stocks.

To estimate food reserves available (including un-harvested crops)

Clearance and access

To clear key roads, airfields and ports in order to allow access for vehicles, aircraft and shipping; also to prepare helicopter landing sites.



Water and power supplies

To re-establish water and power supplies or to make temporary arrangements for them. The provision of potable water is often difficult, particularly in the immediate aftermath of disaster. Water purifying equipment might therefore have to be obtained and/or water purifying tablets issued.

Temporary subsistence supplies

To provide supplies such as clothing/disaster kits, cooking utensils and plastic sheeting, so as to enable victims to subsist temporarily in their own area to reduce the need of evacuation.

Health and Sanitation

To take measures to safeguard the health of people in the stricken area and to maintain reasonable sanitation facilities.

Public Information

To keep the stricken community informed on what they should do, especially in terms of self-help. To prevent speculation and rumor concerning the future situation.

Security

To maintain law and order, especially to prevent looting and unnecessary damage.

Construction requirements

To estimate high priority building repair and replacement requirements.

Disaster welfare enquiry

To make arrangement to handle international and national enquiries concerning the welfare of citizens and residents, including tracing of missing persons.

Maintenance of public morale

Depending on cultural and local circumstances, to make arrangement for counseling and spiritual support of the stricken community. This may involve religious bodies, welfare agencies and other appropriate organizations.

Other requirements

Depending on individual circumstances, other requirements, additional to those above, may arise.

4. Period of response operations

Wide international experience indicates that most governments find it expedient to keep the period of emergency response operations down to a fairly limited period. This period usually tends to be 2-3 weeks, after which remaining relief and associated needs are met through the normal systems and processes of government. Undue extension of the emergency is usually regarded as undesirable in order to avoid:

- Over-dependence on emergency aid (especially food supplies),
- Adverse effects on the local commercial system, and
- Unnecessary delay in returning to normal community life.



6-Day course for NWFP and FATA Government officers & NGOs on
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Power Point Slides Presented at the DRM Training Course

Power Point Training Slides

(Slides Pages 96 - 333)

Basic Concepts and Terminologies in Disaster Management

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Courtesy: ADFP, Beqatub Tolibov

Basic Definitions & Terms

Learning Objectives

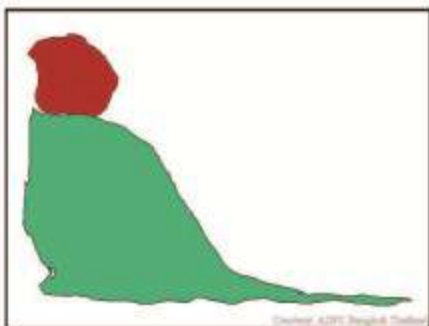
At the end of this module, you should be able to:

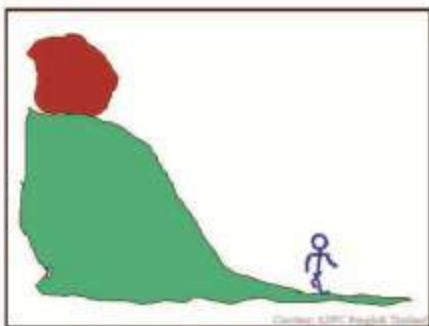
Define disaster, hazard, risk, elements of risk, vulnerability, capacity, response, relief, rehabilitation, reconstruction, development, mitigation, preparedness and prevention

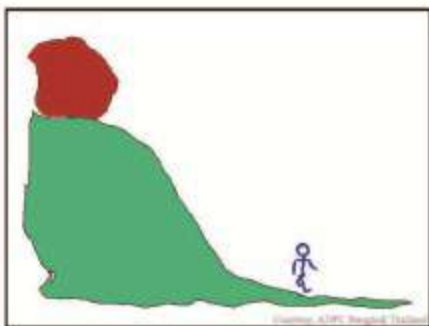
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|---------------------|------------------------------|
| 1. Catastrophe | 11. Development |
| 2. Crisis | 12. Mitigation |
| 3. Emergency | 13. Preparedness |
| 4. Disaster | 14. Prevention |
| 5. Hazard | 15. Disaster Risk Management |
| 6. Risk | 16. Disaster Management |
| 7. Elements At Risk | 17. Recovery |
| 8. Vulnerability | 18. Relief |
| 9. Capacity | 19. Rehabilitation |
| 10. Response | 20. Reconstruction |

Courtesy: ADFP, Beqatub Tolibov







HAZARD

Phenomenon or situation, which has the potential to cause disruption or damage to people, their property, their services and their environment.

There is a potential for occurrence of an event

Source: UNISDR English Thesaurus

DISASTER

The serious disruption of the functioning of society, causing widespread human, material or environmental losses, which exceed the ability of the affected people to cope using their own resources.

An event, either man-made or natural, sudden or progressive, causing widespread human, material or environmental losses

Source: UNISDR English Thesaurus

Vulnerability

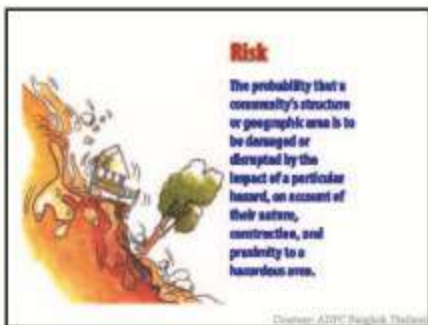


is a condition or sets of conditions that reduces people's ability to prepare for, withstand or respond to a hazard

Source: UNISDR English Thesaurus









Elements at Risk

Persons, buildings, crops or other such like material components exposed to known hazards which are likely to be adversely affected by the occurrence of the hazard.



Exposed Elements



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Response



Actions taken immediately following the impact of a disaster when exceptional measures are required to meet the basic needs of the survivors.

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Relief



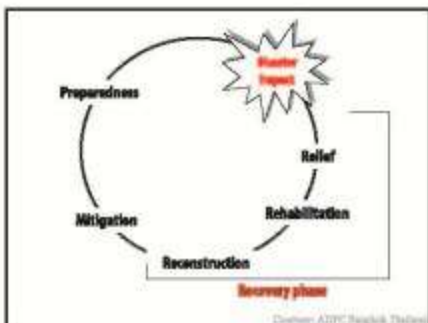
Measures that are required to search and rescue survivors, as well to meet the basic needs for shelter, water, food and health care.

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What is difference between

- 1. Recovery**
- 2. Rehabilitation**
- 3. Reconstruction**

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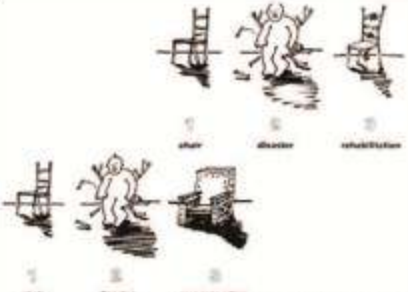
Recovery

The process undertaken by a disaster affected community to fully restore itself to pre-disaster level of functioning.

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Rehabilitation



Actions taken in the aftermath of a disaster to:

- assist victims to repair their dwellings;
- re-establish essential services;
- revive key economic and social activities

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Reconstruction



Permanent measures to repair or replace damaged dwellings and infrastructure and to set the economy back on course.

Disaster ATOP English Thailand

Development



Sustained efforts intended to improve or maintain the social and economic well-being of a community

Disaster ATOP English Thailand



Prevention

Measures taken to avert a disaster from occurring, if possible (to impede a hazard so that it does not have any harmful effects).

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Mitigation

Measures taken prior to the impact of a disaster to minimize its effects (sometimes referred to as structural and non-structural measures).

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Preparedness

Measures taken in anticipation of a disaster to ensure that appropriate and effective actions are taken in the aftermath.

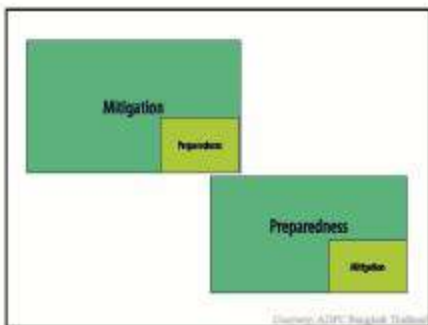
Copyright © 2011 Good and Beautiful

Mitigation	Prevention
Measures taken prior to the impact of a disaster to minimize its effects (sometimes referred to as structural and non-structural measures).	Measures taken to avert a disaster from occurring, if possible (to impede a hazard so that it does not have any harmful effects).

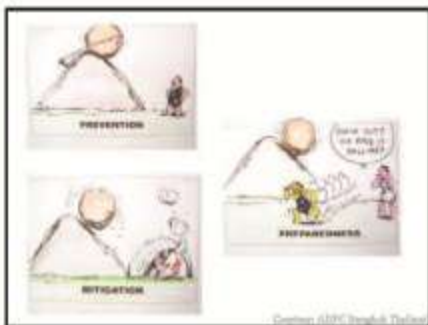
Courtesy: ADFC Resilient Thailand

Mitigation	Preparedness
Measures taken prior to the impact of a disaster to minimize its effects (sometimes referred to as structural and non-structural measures).	Measures taken in anticipation of a disaster to ensure that appropriate and effective actions are taken in the aftermath.

Courtesy: ADFC Resilient Thailand



Courtesy: ADFC Resilient Thailand



**What is the difference
between DM and DRM**

Disaster ADPC Bangkok Thailand



Disaster Management

A collective term encompassing all aspects of planning for preparing and responding to disasters. It refers to the management of the consequences of disasters.

Disaster ADPC Bangkok Thailand

Disaster Risk Management



A broad range of activities designed to:

- Prevent the loss of lives
- Minimize human suffering
- Inform the public and authorities of risk
- Minimize property damage and economic loss
- Speed up the recovery process

Source: ADPC Bangkok Thailand

Disaster risk management - Stress on proactive disaster management responses of prevention, mitigation and preparedness



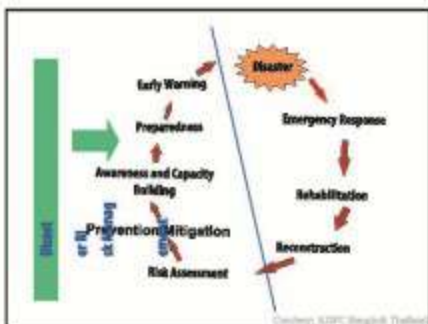
• Prevent, reduce, transfer or live with disaster risk
• Public safety, disaster resilience, sustainable development for all

Source: ADPC Bangkok Thailand

THE DISASTER MANAGEMENT CYCLE



Source: ADPC Bangkok Thailand



Conclusion


- Clear out distinction between different terminologies
- Difference between Preparedness, Mitigation, and Prevention,
- Difference between Recovery, Rehabilitation and Reconstruction
- Difference between DM and DDM
- Sharpen our knowledge about different terminologies

Courtesy: ADFC Bangkok Thailand

QUESTION & DISCUSSION

Courtesy: ADFC Bangkok Thailand

Overview of Risk Assessment



Irfan Maqbool
Tourism Sector Skills Training Project, 2016/17

Risk Assessment

How to assess the risk



```
graph LR; A[Hazard Type] --> B[Risk Analysis]; B --> C[Loss Capacity]; C --> D[Impact]; D --> E[Response Plan]
```


Risk Assessment Process

Hazard Assessment

Vulnerability Assessment

Capacity Assessment

Risk Perception



COASTAL HAZARDS IN PAKISTAN

BY
AMIR MOHYUDDIN





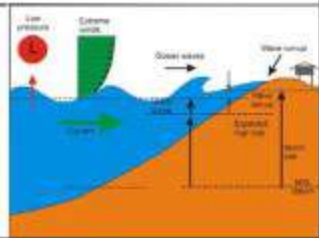
Coastal Hazards (Primary)

- Cyclones
- Storm surges
- Tides
- Ocean currents
- Tsunami
- Wind



The three main types of Secondary Coastal Hazards:

- Coastal erosion caused by storms and/or long-term processes;
- Coastal inundation caused by storms or gradual inundation from sea-level rise; and
- Coastal inundation caused by tsunami.





Storm Surge

- The greatest potential for loss of life related to a hurricane is from the storm surge.
- Storm surge is simply water that is pushed toward the shore by the force of the winds swirling around the storm. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level to heights impacting roads, homes, and other critical.
- The storm surge combined with wave action can cause extensive damage, severely erode beaches and coastal highways.



Hurricane Winds

- Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. Debris such as signs, roofing material, and small items left outside become flying missiles in hurricanes. Extensive damage to trees, towers, water and underground utility lines (from uprooted trees), and fallen poles cause considerable disruption.



HAZARD CONTEXT

• Texas Context

- Cycloidal 1989 severely impacted Texas and both states affected U.S. and Mexico placed record loss of 200 lives
- Cycloidal 2000 affected 26 states of both Texas and U.S. both affected 2.5 million people and caused loss of 400 lives



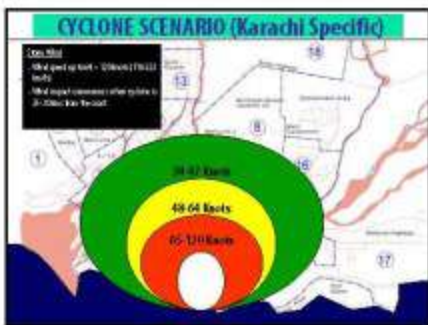


HAZARD CONTEXT

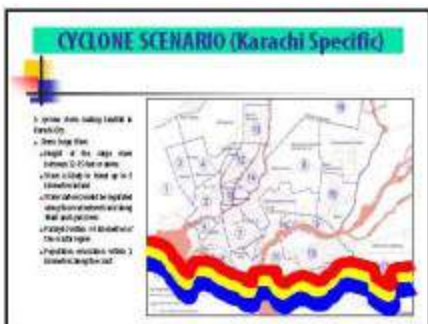
• Global Perspective

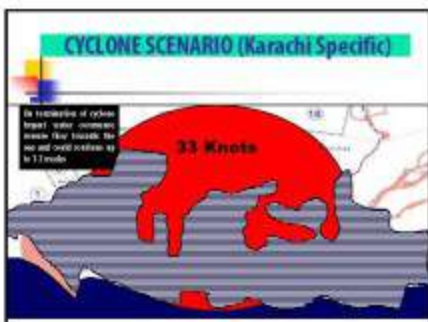
- Tropical cyclones are common in the western and central Pacific, including the Bay of Bengal and Indian Ocean
- More intense than Typhoons and Storms that originate there
- Most frequent and damaging tropical cyclones originate in the Bay of Bengal and the Indian Ocean where they reach the coasts of India, Sri Lanka, the North Atlantic as well as the east coast of Africa and Madagascar





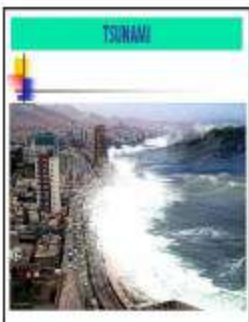












Drivers of Coastal Hazards

- Sea level fluctuations
- Tides
- Storms
 - waves and surfs, which dislodge and move large quantities of sediment, leading to erosion, and cause coastal inundation and structural damage
 - storm surges, which adhere with atmospheric pressure and windily driven surfs elevate the ocean level well above the predicted tide level

Tsunami & subsidence uplift

- Although infrequent events, Pakistan faces a risk of inundation and damage from both local and remote tsunami sources, particularly along the entire from Dabhoi Dabhoi in the east to the district of Gwadar in the west.



Coastal hazard effects on different coastline types

- Coastal hazards are not only dependent on the 'hazard drivers', but also on the geomorphology of the coast. Geomorphology relates to the features, sediment/geology composition, slope and topography of the coastal margins and beaches. There are four
- Main types of geomorphology on the coast:
 - Open-coast sand beaches;
 - Open-coast gravel/shingle beaches;
 - Clifed coasts; and
 - Estuary shorelines.



Human-induced factors can worsen the risk posed by coastal hazards.

- Dams, on rivers and irrigation abstraction that reduce sediment supply to the coast;
- Extraction of sand or shingle from the coastal zone, which can reduce the buffering ability of beaches to absorb storms;
- Ill-considered shoreline protection works that worsen or shift the erosion problem: 'down-drifts' or increase the wave run-up height;
- Dredging of harbour entrances and channels;
- Removal of coastal vegetation; and
- The artificial lowering of dunes for site views or access.



Thank You

Hazard Profile of Pakistan

- Diverse topographical features
- Varied Climate in different regions
- Uneven population density
- Unplanned development in flood Plains
- Vulnerability of population segments
- Poverty
- Pressure on natural resources
- Preparedness for Disaster Management



6. Geographical Exposure



HAZARDS IN PAKISTAN

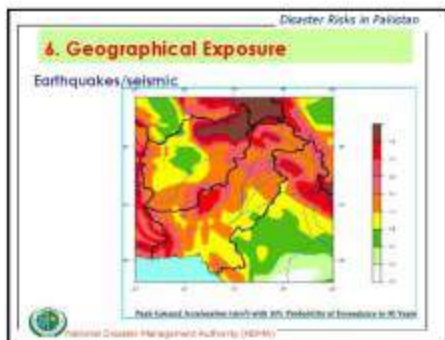
Natural Hazards	Human Induced Hazards
<ul style="list-style-type: none"> > Earthquakes > Floods > Tsunami > Avalanches > Landslides > Cyclones/Storms > Glacial Lake Outburst Floods (GLOF) > Droughts > River Erosions > Pest Attacks > Epidemics 	<ul style="list-style-type: none"> > Transport accidents > Oil spills > Urban fires > Civil conflicts > Internal displacements > Chemical, nuclear & radiological (CNR) accidents

TYPES OF HAZARDS

Predictable Hazards	Un-Predictable Hazards
<ul style="list-style-type: none"> > Floods > Droughts > Tsunami > Cyclones/Storms > River Erosions 	<ul style="list-style-type: none"> > Earthquake > Avalanches > Landslides > Glacial Lake Outburst Flood (GLOF) > Pest Attacks > Epidemics > Accidents of all types









HAZARD CONTEXT

Global Lake Wetland Flood (GLWF)

- There are 570 glacial lakes worldwide a total of 240 lakes
- out of which 12 lakes are considered dangerous
- An agreement for GLWF monitoring was entered at WBGU in 2003
- Since 2003, starting from the Arctic Basin, all glacial lakes have been monitored for any environmental, natural and their physical configurations have been recorded



Global Lake Wetland Flood (GLWF)

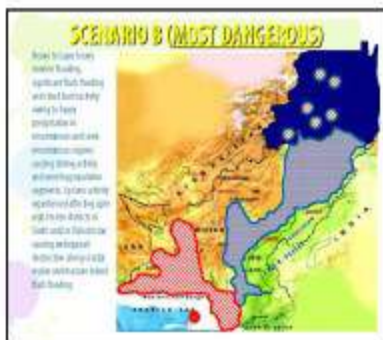
- There are about 1250 glacial lakes in a total of 240 lakes, out of which 12 are particularly dangerous and can result in GLF, severely damaging life, property and livelihoods. Although the impact of GLF is widely reported, records and statistics are scarce in order to follow in the future in regions vulnerable to this risk region in 2002, the European Agency for the Environment, EEA considered as one of the impact of climate change and forecasting that the GLF need to be taken into account in 2002-2008 in particular. Since its report from the world panel a great part of the world has been able to identify the dangerous. A large area of the lake has been able to be recorded in the future.
- The following sites are vulnerable to Global Lake Wetland Flood (GLWF)
- **World's Most Dangerous Lakes**
- **WBGU, GLE, WBGU, WBGU, WBGU**

HAZARD CONTEXT

Spreading in the Arctic Basin

- 500 of the lakes is located in the Arctic region and its distribution: Siberia, Alaska, Canada, Greenland and Tibet
- Each number of lakes has been along the lake, but there are not accurate data with 12 lakes approximately and about 500 lakes have been
- These lakes are in a very complex of the environment










HAZARD CONTEXT

HAZARD CONTEXT

- Cyclone of 2009 was widely reported. The coastal states of Orissa suffered 3.6 million people lost overall loss of 1002 lives.
- Cyclone Nargis in 2007 affected 20 districts of India. 3.5 million people lost 2.5 million people and overall loss of 400 lives.



HAZARD CONTEXT

General Overview

- Various monsoon winds in India cyclones and weather systems. Based on population, engineering, trees, etc. of tropical and sub-tropics.
- Many states have forests and mangroves in regions like Andhra Pradesh.
- Another system is bringing knowledge of tropical cyclones to a lesser extent. Andhra Pradesh is a state of tropical cyclones in the North Atlantic. Sea which impact west of India, and to the north.



Hazards

Tropical Cyclones

- Cyclones have become frequently deadly but most of them are not widely reported. For example, the cyclone of 2009 had a major impact on districts of Andhra Pradesh. 3.6 million lives lost, 11,000 cattle perished, 23 settlements completely wiped out, 144 boats damaged and about 25 million people were affected because of the cyclone. "Phan" in 2008 had a major impact on 20 districts of Andhra Pradesh and affected 2.5 million and caused the loss of nearly 400 lives.
- **Some states are vulnerable to tropical cyclones** - Orissa, West Bengal, Andhra Pradesh, Kerala, Tamil Nadu, Karnataka, Maharashtra, Gujarat, etc. affected by cyclones like, Bay of Bengal, Andhra Pradesh.







TSUNAMI



TSUNAMI VULNERABILITY

- District Gwadar
- District Lasbela
- District Karachi
- District Badin
- District Thatta

INTERNAL DISPLACEMENTS



Regions Vulnerable to IDPs

- FATA
- Northern Areas
- South Punjab
- South-East Sindh
- Balochistan
- Azad Jammu & Kashmir

URBAN FIRE



Urban Fires

- For the last two decades, there has been a significant migration from rural to urban which has put a lot of pressure on the urban areas of Pakistan thereby creating more slum areas in the cities. In addition, there is a lot of construction activities taking place, and residents are not following building codes. Over and above, mushrooming of unplanned CNG gas filling stations in urban areas and unauthorized LPG gas stores are quite common. The sale of petroleum products in the residential areas is also widespread in the cities. These practices pose major fire risk in urban areas. While the risk of fire exists in all dwellings, the cities with more industrial units, CNG stations/petrol Pumps, godowns are relatively more fire prone. The appended list reflects urban centers with a pronounced vulnerability.
- **The following Cities are vulnerable to fire.**
- **City/Province**
- Quetta in Balochistan, Peshawar in (NWFP), Faisalabad, Gujrat, Gujranwala, Lahore, Multan & Rawalpindi in Punjab, Hyderabad, Karachi & Sukkur in Sindh

Forest fires

- India has different types of forests, ranging from Mangroves in the east to Alpine vegetation in the north. Out of all these types, subtropical forest have evergreen with forest and sub-tropical. This is the most fire prone forest in India.
- The following districts are prone to forest fire.
- Districts: Provinces.
- West Coast: Districts of Jammu, Karnataka, Kerala, Madhya Pradesh, Odisha, Uttar Pradesh, Madhya Pradesh, Jharkhand, Chhattisgarh, Andhra Pradesh and Gujarat.





Landslides

- Landslides are basically the rapid mass movements of land. Landslides are mostly driven and facilitated by slope of the rock mass, water content and material of the rock mass. Landslides can be triggered by an earthquake, rainstorm, wind or anthropogenic activities e.g. Mining. Although landslides are ubiquitous in any mountain range, the Himalayas being the youngest mountain chain with fastest rising provide tremendous prospects for initiation of landslides. Severe monsoon rains and or exceptional melting of Himalayan glaciers provide abundant water to cause many landslides. Most of the landslides in Pakistan occur within the loosely packed fluvio-glacial sediments and are young sub-tropical by tectonism. Landslides are common in the Northern Areas, Kachin, and the Murre Hills etc. The impact of landslides appears minimal and localized in nature but cumulative damage and loss of life may sometime exceed many major catastrophes. The communities hit by landslide are those who live on slopes or steep areas in the mountains or within immediate surroundings of such steep slopes. The major impact of landslides is on housing, livelihoods, and blocked roads.

- The following districts are vulnerable to landslides.**
- District/ Province/State/Region.**
- BaghAzad , Bhimber,Neelum and Muzaffarabad in Azad Jammu & Kashmir, Astore, Diamer, Gilgit & Ghanche in Northern Areas, Kaghan,Naran & Chitral in NWFP

Avalanches

- Northern areas and Kachin region experience avalanches on seasonal basis. Local communities surrounding the avalanche area are vulnerable to this disaster. Avalanches are a kind of local natural disaster and their impact is localized to the communities living nearby or in the area where avalanches happen on a regular basis. Therefore, the impact of avalanches is minimal. Still, there were 5 deaths reported in winter of 2008 due to avalanches. The following districts are vulnerable to avalanches.
- District Province/Region.**
Astore, Gilgit Ghanche, Gilgit, Skardu in Northern Areas as well as Chitral in NWFP









Transport Accidents

- Transport accidents, particularly road accidents, are common in Pakistan. The major reasons for this are poor road conditions, single road tracks, and unsafe driving practices. Some big accidents have also been reported on railways in Pakistan. This has been caused mainly because of dilapidated and worn out railway infrastructure.

Industrial Accidents

- Industrial sites like Karachi, Lahore, Faisalabad, Gujrat, Gujranwala are prone to industrial disasters. The chemical industry faces the potential threat of disasters because of possible chemical explosions.

The following districts are vulnerable to industrial accidents.

District/Province.

- Karachi and Hyderabad in Sindh
- Faisalabad, Gujrat, Gujranwala, Lahore, Multan & Sahiwal in Punjab
- Peshawar, Gujranwala, Amritsar and Haripur in Northern West Frontier Province
- NWFP and Hub in Balochistan



BALUCHISTAN PROVINCIAL PROFILE

- Area 34.7 Million hectares(40% of Pak)
- Population 8.4Million (19% of total)
- 30 Districts
- 80% area is arid/semi-arid/semi-arid
 - Sulaiman
 - Turbat
 - Central Baluch
 - Mirpur
 - Chagai
 - Quetta and Mastohat

- 20% area is flood plain
- Climate is Continental semi-arid Mediterranean with rainfall 200-300mm
- Rural settlements 9000
- Urban growth rate is 4.5%
- Building type Concrete in urban area and mud or brick as well as sheeting
- Hospitals 90, beds 4833
- Schools 8256 boys and 3156 girls

Hazard Profile

- Droughts (Worst 1997-2002)
 - All Districts affected
 - Most affected Mastohat, Jhalwat, Gwadar
 - Worst affected Turbat, Chagai, Mastohat and Turbat
 - Growth rate fell to 2.5%
 - Rainfall 2-25 mm
- Earthquakes
 - Quetta 1935(25000 death, Scale 7.0)

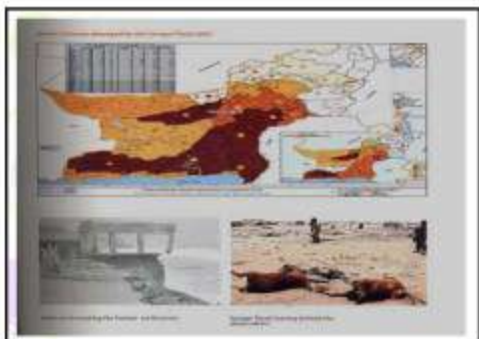
- Paris Earthquake and Tsunami
 - 4000 deaths (scale 8.3, 1945)
- Zorast Earthquake
 - 225 deaths (scale 6.3, 2000)
- Floods and Flash Floods
 - 2007 Yemen
- Landslides
- Cyclones
 - from 1971-2007 destructions

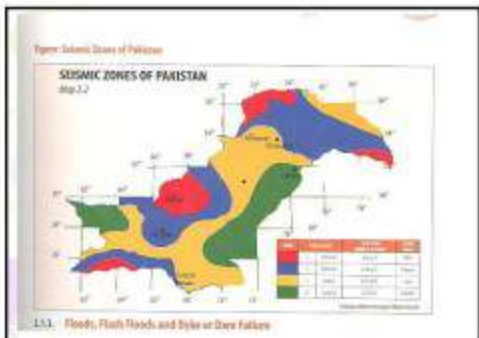
- Terrorism
- Water transport accidents
- Fire (Urban and Rural)
- Communicable Diseases
- Civil Conflicts and Crisis situations

Chapter 1
Profile of Balochistan

Administrative Province

The image shows a presentation slide titled 'Chapter 1 Profile of Balochistan'. It features a map of Balochistan, Pakistan, divided into administrative districts. An inset map shows the location of Balochistan within the borders of Pakistan. The slide also includes the text 'Administrative Province' and some small logos at the bottom right.



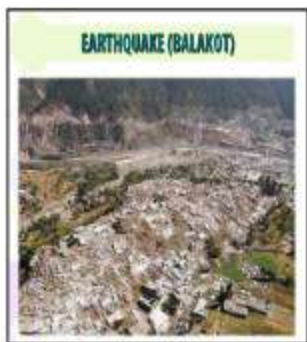


The slide features several elements: at the top, three small photographs showing people in a classroom setting; below them, a table with two columns of data; and at the bottom, two diagrams. The left diagram shows a cross-section of a dam with water behind it, and the right diagram shows a person's head and shoulders submerged in floodwater.

Zone	Intensity	Frequency	Duration
Zone I	IX	High	Long
Zone II	VIII	Medium	Medium
Zone III	VII	Low	Short
Zone IV	VI	Very Low	Very Short
Zone V	V	Very Very Low	Very Very Short







EARTHQUAKE (MARGALLA TOWER)



Observation

- The structural elements of the existing structure have already failed.
- In earthquake-prone areas, the poor quality of building infrastructure, its high weight, and the lack of seismic resistance of the building are the main causes of failure. Therefore, these buildings are more vulnerable to earthquakes. It is not possible to see them along with your eyes, but you can see them in the past, for example, in the construction of the building, the use of materials, the design, the construction, the maintenance, and the construction cycle, all of which contribute to the vulnerability of the structure. It is not possible to see them in the past, but you can see them in the present.

- In the field, some buildings are damaged due to high seismicity, poor construction, poor maintenance, and old wiring systems, and some are damaged due to high seismicity, poor construction, and old wiring systems.
- In the field, some buildings are damaged due to high seismicity, poor construction, and old wiring systems, and some are damaged due to high seismicity, poor construction, and old wiring systems.
- The construction of buildings is very vulnerable to high seismicity, and the construction of buildings is very vulnerable to high seismicity, and the construction of buildings is very vulnerable to high seismicity.



- electrical and communication infrastructures, highways, and drainage networks through climate change, increased frequency and intensity of cyclones and their surge.
- The climate strategy of many governments has been oriented towards development of the sea.
- Most areas considered in the northern zone are characterized by moderate, saline, fresh water conditions, optimum population, and very low or no concentration of cities. Their vulnerability is further compounded by deforestation, which leads to frequent soil erosion and landslides, the impact of which is increased in magnitude after the climate becomes wet. In general, all and communities become vulnerable.
- About one-third of the population live in poverty and most poor people live in hazard-prone areas. Their capacity to fight against natural disasters is low. Less developed nations and their people are particularly vulnerable to disasters.



- **Factors leading to Vulnerability**
- **2.3.1 Population Growth**
- The population of Pakistan has grown by 125 percent since 1947 (the year of independence). The growth of population has negatively affected the socio-economic development of the country. People have located themselves in areas that are more vulnerable to the different types of hazards. In urban areas, people often live in slums, which are more likely to regular floods. In rural areas, poor people live in fragile settlements in coastal areas, people live close by the sea. It is reported that about 100 million live in industrial areas and global cities, which are more vulnerable to different hazards, from fires to water flooding, epidemics, and chemical exposures.

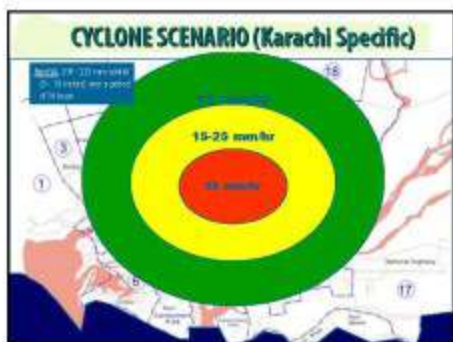


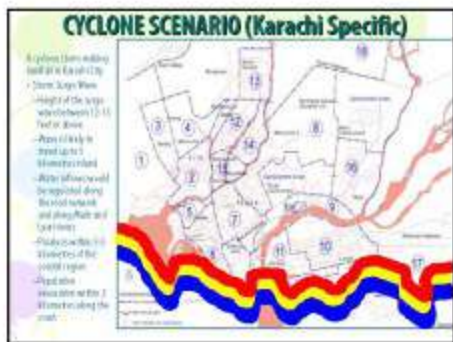
- **Depleted Infrastructure and Migration**
- Rapid urban migration has resulted in the uneven growth of urban centers in Pakistan. Changes in consumption patterns and lifestyles in cities. The government has been unable to keep pace with rapid urbanization, resulting in slums and informal settlements. In Karachi, Lahore, and other coastal coastal, cities have experienced the environmental problems and degraded the environment through cutting of trees, land erosion, which is the main cause of floods. Adoption of green building and industrial waste policies in the few advanced. Land use and flood impact because of deforestation and land erosion. The cutting of mangrove forests in the Indian sea and reduction of rock wall discharge has led to the sea level rise to seawater intrusion in the coastal part of South.

- 1. **High dependency on Agriculture and livestock**
- 2. Agriculture and livestock are main sources of income particularly in flood and drought prone areas of Pakistan as there is no viable industry in these livelihoods. Therefore, the impact of flood and drought is very high for these communities. When there is flood or drought, they are forced to take more daily longer time, to reach impact assessment. They must care that these communities suffer more from flood because of high reliance on livelihood.
- 3. **3.3 Poverty in Hazard Prone Areas**
- 4. Poverty is one of the main factors of vulnerability, exposing people and communities to disaster. Poverty reduces the capacities of the communities to mitigate, respond and recover the impact of a hazard. Absence of safety nets and limited access to social services for people's flexibility to sustain the impact of disaster. The capacity of the poor lies in to cope prone areas, especially exposing themselves to be in a way of the other.


- 1. **5. Lack of Institutional Capacity to Deal with Disaster Risk Reduction**
- 2. The institutional capacity of different government departments depends on its limited to deal with disaster, particularly at the local levels. Another the local capacity is weak combination of three aspects of physical and financial level. One and other, early warning systems not effective, and normally warnings do not reach the most at risk. There is a lot of focus on preparedness because of the capacity and scale of assistance. All these factors decrease the vulnerability of local population to different disasters.
- 3. **3.4 Climate Change and its Impact**
- 4. Global warming causes damage to the entire environment. The impact includes loss in biodiversity, rise in the sea level, frequent cyclones, drought, and abnormal shifts in the weather patterns. Increased flooding changes the freshwater supply and water level rise in water bodies. This can also lead to the salinization of land and crop yield.











**Government of NWFP
Provincial Disaster Management Authority**

**An overview of the initiatives for Disasters
Preparedness, Mitigation, Relief and Rehabilitation in
NWFP**

Issued: 1st October 2009

Chronology of Disasters in NWFP

- 1 The devastating earth quake of 26th December 1973 in Kalamen
- 2 The 8th October 2005 devastating earth quake in Hazara Division and A.K.
- 3 Frequent seasonal floods in Peshawar valley and flash floods all over the Province
- 4 Landslides in Chitral & Hazara Division (Kohistan, Manohra and Battagram)
- 5 Heavy snow fall in Chitral & Hazara Division (Kohistan, Manohra, Abbottabad and Battagram)
- 6 Hoarding of Afghan refugees and damage starts the explosion during the entire Afghan war since 1978.

Chronology of Disasters in NWFP

- 1 Militancy, terrorism & extortion (terrorist attacks, explosions, suicide bombing and abductions after 9/11).
- 2 Ethnic conflicts (D.I Khan, Rings, Peshawar, Kohat etc).
- 3 Forest fires
- 4 The latest migration of IDPs from Pakistan.
- 5 Drought in southern districts of D.I Khan, Tank, Lark and Karak during 2000-2003.
- 6 Urban fires, road accidents & epidemics.
- 7 Impacts on the socio-economic life of the Province due to law and order situation in the Tribal belt.

Institutional Arrangements for DRR & DRM

1. PDMA Established under NDMA.
2. PDWC established under NDMA.
3. DDMA's and DDWCs established.

Work done during the last two years

1. DRM Plans launched for Muzekki, Shingli, Bettegram and Akhtabad.
2. Provincial DRM Plan prepared and a comprehensive DRM plan is in the final stages of preparation.
3. Disaster Management & Preparedness Atlas prepared.
4. DRM Plans being prepared for all remaining districts.
5. Awareness and capacity building.

Institutional Arrangements for DRM

1. Regular set up established for PDMA with 52 positions, largest among the provinces.
2. Established military command structure and PRC also fixed in PDMA.
3. Civil Defense being integrated with PDMA.
4. Regular Budget Allocated for PDMA and the Authority made fully functional.

The Malakand Crisis Management

1. The country saw the historic displacement of about 3.5 million population of Swat and other areas of Malakand Division (about 0.234 million placed in camps and the remaining accommodated by host families).
2. ERU under the auspices of PDMA effectively managed the crisis of IDPs (relief, compensation and their safe return).
3. PDMA/ERU effectively coordinated the assistance from donors, NGOs and civil society.

The challenge of Rehabilitation and Reconstruction in Malakand Division

1. PARRA (Provincial Relief, Rehabilitation and Settlement Authority) has been established under the auspices of PDMA.
2. The body has been made functional in record time and is effectively spearheading the RR&R activities.
3. The Authority has consulted all the stakeholders, have mobilized ways and means and effectively presented the case at national and international forums.
4. DNA has been completed and FOMA under process, composite PC is prepared and activities of R&R already initiated.

Estimated cost of early Recovery and Reconstruction based on DNA Public Sector

Sector	Rs. in Million Estimated Cost
1. Education	5484,280
2. Health	1527,500
3. Communication	39489,000
4. Administrative	919,881
5. Water	317,980
6. Power	1599,000

Quantum of Primary DNA Public Sector

Sector	Rs. in Million Estimated Cost
1. Agriculture (crop)	12,689
2. Livestock	54,513
3. Irrigation	1,659
4. Fisheries	9,490
5. Industries	2,785

Quantum of Primary DNA Private Sector

Sector	Rs. in Million Estimated Cost
1. Housing	151,865

R & R Strategy

1. Support by the friends of the democratic Pakistan.
2. Anticipated Dooms support.
3. Establishment of MOF.
4. Private cooperation.
5. PCB- for long term sustainable Economic growth and infrastructure development.

Short and medium term Plans

1. Rescue 1122 has been established in health and its scope being extended to law & order, flood control and other agencies.
2. Modernization of DRR.
3. Establishment of EOCs.
4. Establishment of FEMA Fund.
5. Launching of DRR based model projects.

Short and medium term Plans

1. Augmentation of the logistic, warehousing facility for emergency relief goods and equipment.
2. Establishment of GS based rescue and relief services.
3. Disaster mitigation and rehabilitation projects (Rs. 97,604 million allocated to 14 projects during 2009-10).
4. 7% of district ADP allocated to rescue & relief disaster, Defense.
5. Strengthening of the capacity of DDMs and their integration with Civil Defense.





HAZARD ASSESSMENT

Country: A/P/ Bangkok Thailand

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Session objectives

- **At the end of this session the participants will be able to:**
 - Describe the hazard assessment approaches.
 - Identify the information sources for obtaining data on past and future events.
 - List and explain hazard assessment techniques and tools.

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Types of Hazards





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Types of Hazards

- Hydro Meteorological Hazard
- Geological Hazard
- **Biological/ Environmental Hazards**
- Technological Hazards
- Future/Complex Hazards

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Types of Hazard

Hydro Meteorological Hazard

- Tropical Cyclones
- Floods
- Storm Surges
- Drought
- Tornado
- Extreme Temperature
- Lightning

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Types of Hazard

Geological Hazard

- Earthquake
- Volcano
- Tsunami
- Landslide
- Ground subsidence
- Glacial (Avalanches)

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Types of Hazard

Biological / Environmental Hazards

- Pandemic/Epidemic in humans
- Pandemic/Epidemic in plants
- Pandemic/Epidemic in animals
- Pollution
- Psychological
- Pest Infestation (Locusts???)
- Wildfire



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Types of Hazard

Technological Hazards

- Transport accidents
- Industrial explosions and fires
- Accidental release of toxic chemicals
- Nuclear accidents



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Future / Complex Hazards

- Climate variation
- El Nino
- La Nina???
- Glacial lake outburst???
- Societal hazards



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Primary hazards associated
with
Secondary hazards



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HAZARD ASSESSMENT

"The process of studying the nature of hazards determining its essential features (degree of severity, duration, extent of the impact area) and their relationship".



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How we can assess
hazards???



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HAZARD ASSESSMENT

Hazard

<p>Factors to be considered</p> <ul style="list-style-type: none"> • Causative factors? • Where? • How often? • How strong? • How long? • How fast? • Any warning signs/signals? • Time gap between warning signs and the impact? 	<p>Information required</p> <ul style="list-style-type: none"> • The understanding of factors that create, result in a hazard • Historic reports on past incidence of hazards, in particular the location, frequency, severity, duration of the event • Scientific studies/maps, long term data logging
--	---

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Usage of Hazard Information in Natural Hazard Assessment

Sources:

- Myths and legends??,
- Historic records??,
- Research data???

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Hazard Assessment Techniques and Tools

Hazard Zonation mapping

- Hazard maps outline zones that are defined in terms of the probability of occurrence of potentially damaging phenomena within a certain span of time within a specified location or an area. (Varnes, 1984)

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HAZARD ZONATION MAPPING

MAPPING TECHNIQUES AND TOOLS

- Tapping local community knowledge (PM-Participatory and appraisal and PMA-Participatory rapid appraisal)
- Examination of post-event survey reports
- Survey reports by subject specialists???
- Scientific investigations and instrumentation
- Remote sensing (RS) imagery
- Geographic Information Systems (GIS)



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TOOLS FOR HAZARD ASSESSMENT

- Hazard map
- Historical profile
- Time line
- Seasonal calendar
- Hazard Assessment Matrix



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Factors to consider in understanding the nature and behavior of hazards

- Force

Factors that make the power of hazards, e.g. intensity and magnitude of flooding

- Speed of hazard

Rapidity of arrival and impact

- Frequency

Time related patterns of occurrence of hazards



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Factors to consider in understanding the nature and behavior of hazards

- Seasonality

Occurrence of a hazard in a particular time of the year

- Duration

Hazard's presence in a time scale



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Hazard Matrix

Hazard Type	Origin	Warning Sign	Pre-warning	Loss	Speed of onset	Duration	Frequency	Seasonality	Duration
Building fire	Electricity, Gas, Heating, Smoking, Candles, Oil, etc.	Smoke, Heat, Sound, etc.	Fire alarm, Fire extinguisher, Fire escape, etc.	Property loss, Injury, etc.	Instant	Minutes to hours	Highly frequent	Year-round	Days to weeks
2. Natural hazard	Earthquake, Flood, etc.	Seismic activity, etc.	Earthquake warning system, etc.	Property loss, Injury, etc.	Instant	Minutes to hours	Highly frequent	Year-round	Days to weeks
3. Daily hazard	Accident, etc.	Warning signs, etc.	Warning signs, etc.	Property loss, Injury, etc.	Instant	Minutes to hours	Highly frequent	Year-round	Days to weeks
4. Other hazard	Chemical, etc.	Warning signs, etc.	Warning signs, etc.	Property loss, Injury, etc.	Instant	Minutes to hours	Highly frequent	Year-round	Days to weeks



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**QUESTIONS
DISCUSSION**



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<p>VULNERABILITY ASSESSMENT</p> <p>Learning Objectives</p>	<p>At the end of this session, you should be able to: Describe the "elements at risk" per hazard type</p> <ul style="list-style-type: none"> • Define different categories/types of vulnerabilities • Explain the process of conducting vulnerability assessment
--	---

<p>Vulnerability</p>	<p>A set of prevailing or consequent conditions which adversely affect the community's ability to prevent, mitigate, prepare for or respond to hazard event</p>
-----------------------------	---





















Vulnerability Assessment

- A process to identify what elements are at risk per hazard type, and to analyze the root causes of why these elements are at risk



WHO
Asian Disaster Preparedness Center

Dynamic Pressures

Dynamic Pressures

Lack of:

- Local risk reduction policies, good services
- Weakness in institutions, and insufficient people
- Resources
- Insufficient training
- Appropriate skills and technology

Major Factors:

- population explosion
- urbanization
- mismanagement
- infrastructure

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WHO
Asian Disaster Preparedness Center

Underlying Causes

Underlying Causes

Unethical access to:

- land/resources
- land/resources
- strategic
- critical systems
- transport systems
- facilities

Vulnerability by disaster risk reduction

17

WHO
Asian Disaster Preparedness Center

Progression of Vulnerability

Underlying Causes	Dynamic Pressures	Facilitating Conditions
Lack of settlements in low risk areas	Rapid population growth	Design of facilities
Unequal access to power	Urbanization	Unprotected infrastructure
Weak legal and economic systems	Weak local markets	Low and unstable incomes
	Episodic	Weak institutions (structures) for public action
		Disease

WFP
World Food Programme Center

Physical / Material Vulnerability



- Hazard-prone location of community houses, farmlands, infrastructure, basic services
- Degrade and construction materials of houses and buildings
- Insecure and risky sources of livelihood

WFP
World Food Programme Center


Physical / Material Vulnerability

- Lack of access and control over means of production (land, farm inputs, animals, capital)
- Inadequate economic fall back mechanisms
- Dependence on money lenders
- Occurrence of acute or chronic food shortages
- Lack of adequate skills and educational background
- High mortality rates, malnutrition, occurrence of diseases, insufficient coping capacity
- Over exploitation of natural resources



WFP
World Food Programme Center

Physical / Material Vulnerability



- Lack of basic services: education, health, safe drinking water, shelter, sanitation, roads, electricity, communication
- Exposed to violence (domestic, community conflicts, civil conflicts or war)



Social/Organizational Vulnerability

- Weak family / kinship structures
- Lack of leadership and initiative to solve problems or conflicts
- Exclusion of certain groups from decision-making about community life or unequal participation in community affairs
- Absence or weak community organizations (informal, governmental, indigenous)

Social/Organizational Vulnerability



- Conflicts: ethnic, class, beliefs, caste, ideology
- No or neglected relationship with government, administrative structures
- Isolated from outside world

WFP
World Food Programme Centre

Motivational / Attitudinal Vulnerability

- Negative attitude towards change
- Passivity, fatalism, hopelessness, dependency
- Lack of initiative or "fighting spirit"
- Dependence on external support

WFP
World Food Programme Centre

TOOLS FOR CAPACITY AND VULNERABILITY ASSESSMENT

- Semi-structured interviews
- Hazard and vulnerability map
- Community drama
- Focus group
- Seasonal calendar
- Institutional / social network analysis
- Problem tree
- Ranking

WFP
World Food Programme Centre

TOOLS FOR CAPACITY and VULNERABILITY ASSESSMENT

- Resource map
- Historical profile
- Gendered resource mapping
- Focus group discussion
- Livelihood / coping analysis
- Institutional and social network analysis

UNEP
United Nations Environment Programme

Vulnerability Assessment

- We should recognize that vulnerability assessment is complex
- Vulnerability is specific to location, sector, interest group, etc.
- Vulnerability and poverty are strongly linked




UNEP
United Nations Environment Programme

Group Exercise Vulnerability Assessment (Hazard Specific)

Setting	Disaster At Risk (DAR)	Elements at Risk (EAR)	Characteristics of DAR that Contribute to Vulnerability
Urban	Earthquake Floods	Buildings, roads, hospitals, schools	Age, density, height of buildings, soil, weather resistance, etc.
1. Support flooding in Urban areas			
2. Support flood risk reduction in urban areas			
3. Support flooding in Rural areas			
4. Support flood risk reduction in rural areas			





Capacity Assessment



Courtesy: ADFP Bangkok, Thailand

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What is Capacity



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What is Capacity



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Key Concepts



Even the weakest in the community have some skills, resources and strengths to help themselves and perhaps others.

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Capacity Assessment



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Categories of Capacities

(All-We-Voluntary)

- ❖ Physical / Material
- ❖ Social / Organizational
- ❖ Attitudinal / Motivational

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Categories of Capacities
(And the Vulnerabilities)

- ❖ **Physical / Material**
 - Cash, Land, Tools, Food, Jobs, Access to Credit
- ❖ **Social / Organisational**
 - Social Networks, Extended Family, Local and National Welfare Institutions
- ❖ **Attitudinal / Motivational**
 - Sense of Control, Power, Capabilities, Confidence

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Capacity is

- Specific to hazards
- Differ among countries & organizations
- Change over time
- Sustained through ownership and local initiatives

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Triggers for capacity development ????

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Triggers for capacity development

- High impact events
- Frequent events
- Motivated individuals and institutions (champions)



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Capacity Dimensions



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1. Awareness

- Understanding of the hazards, risks, warning systems, preparedness measures and the ability to utilize information to counter or avoid the hazard effects.



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2. Laws and Regulations

- a. Provide a formal basis for counter-disaster action.
- b. Define major responsibilities in legal form which helps and ensure that such responsibilities will be properly implemented.



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2. Laws and Regulations (cont.)

- c. Ensure that all levels of the national counter-disaster structure receive the full benefit of the government's resource.
- d. Establish mechanisms for interagency cooperation and coordination.



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3. Organizational Mechanisms

Vehicles to implement the risk reduction and preparedness activities and measures.


Key Indicators:

- Clearly defined roles and resources.
- Leadership.
- Presence at local, sub-national and national levels.




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4. Plans

- National, Provincial, District
- Organizational plans
- Community plans





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5. Expertise and technology



- Trained manpower to reduce risks and respond to disasters???
- Equipment and machinery for emergency response and risk reduction???



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Type and Levels of Capacities



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Individual

- Knowledge, physical health, expertise, behavior

Community

- Coping mechanisms
- Local knowledge
- Community groups
- Tools and equipment

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Government and civil society

- Government Resources
 - Government Agencies/Offices and Assets
- Non-Government Resources
 - Airlines
 - Transport Companies
 - Distributors of Commerce
 - Welfare Organizations
 - Disaster Relief Organizations (Red Cross/Red Crescent, etc.)
 - General Public (Volunteers, blood donors, etc.)
 - Radio Stations/Operators
 - Food Suppliers
 - Church and Religious Groups

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International Resources

- Donor/partners
- Government-to-government understanding

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Evaluation of Resources



- **Capacity:** Ability to carry out designated task (e.g., first aid, search and rescue, building repair)
- **Availability:** Requiring time to be able to respond
- **Durability:** the degree to carry sustained operations
- **Operational Integrity:** the ability to take on an allotted task and complete it satisfactorily without supervision or continuous detailed direction



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Group Exercise



- Identify any hazards
- Enlist the resources available with the government and civil society to mitigate and prepare for the priority hazards
- Categorize the resources like *(physical, social and attitudinal etc)*
- What other resources are needed *(but lacking)*

The groups will be adding which resources not been covered by the previous group.



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Climatic Changes Adaptation

- ### Key Impacts of Climate Change
- Climate variability and extreme weather events
 - Natural disasters
 - Food shortages and security
 - Water quality and quantity
 - Urban quality: heat stress and air pollution
 - Increase in infectious diseases
 - Increase in crop pests and livestock disease
- http://www.pdolis.com/inf/har2000/VVVC_0302_0818.pdf



Recent Trends of CC in Pakistan

- Rise in mean temp. of 0.6-1.2°C ... in arid and semi arid
- 10-15% decrease in both winter and summer rainfall in coastal belt and inland plains
- More rapid recession of Himalayas (due to slow tectonic RS (plate tectonic system) flows
- Reduction in capacity of natural reservoirs
- Increased risk of floods / drought
- Severe water-stressed conditions
- Food insecurity
- Upstream increases of sea level water in the Indian delta
- Increased health risks (heat strokes, malaria and other vector-borne diseases).

Flooding

Disastrous flooding in Rawalpindi city during monsoon rains in 2001, which claimed over 100 lives



Slippage of Sonogher Glaciers in Chitral Pakistan (2007)



Climate Risk Management

- There is evidence now that observed regional warming has affected natural eco system

Therefore

- Climate Risk Management is the only response strategy to minimize potential impacts of climate change.

What is Climate Risk Management

Climate Risk Management approach aims at addressing the need for adaptation and mitigation in response to actual or expected impacts of climate change

Climate Risk Management

	Actions
Private	<ul style="list-style-type: none">○ Purchase of insurance○ Construction of "climate-resilient" houses
Public	<ul style="list-style-type: none">○ National disaster insurance fund○ Urban planning○ New building code, design standard○ Insurance for livestock○ Awareness campaigns

Some Adaptation and Mitigation Examples

Bio-shields in the Coastal Areas

- Many natural barriers destroyed by the poor planned coastal development in recent years
- Mangroves prevent soil erosion and cause soil deposition which helps to secure the land and even increase it
- Mangroves create a barrier against tsunami damage and sea level rise which is vital to protecting people's lives and land during these events



Barrier against sea

- Many great cities are built on low lying coasts which are vulnerable to sea level rise
- The Thames Barrier has been built to protect London from storm surges



Battling the deserts

- Plantation of drought resistant grassland & shrubs
- Plantation of drought resistant plant species as barriers against moving sand dunes



House-hold level water storage



New farm crops

- Wheat, the commonest crop, is now produced through cross crops, golden and hybridised
- Bitter melon and okra being grown in plots, with brinjal growing in deep well water's shade
- Cereals like rice are more popular in irrigated areas than the arid, dry zones



Living with disasters

- Along rivers in the low-lying Netherlands, where people live in the flatish houses with water-tight basements that act like coffins and can rise up to lift.

Living with floods

Bangladesh:
People have erected mounds that rise above the flat landscape. When flood water retreats, then animals and human beings can come down.

Safe refuges

Plantation

- Burning fuel will release CO₂ but the same trees should be planted
- More plantation is important against floods, fire & drought



Education and Awareness

The media can play a crucial role in public education on climate change

Exploring Renewable Energy

- Wind and Hydroelectric power
- Solar energy
- Geo-thermal energy
- Bio-fuel



Wind farms

One the world's largest offshore wind farms, has 80 turbines spinning in the North Sea 10 miles west of Denmark. It produces enough energy for 150,000 households.



Moving forward we must!

- Improve communication between the key stakeholders
- Share experiences and tools
- Develop programmatic approach
- Benefit from local or traditional knowledge
- Develop competences

Group Work

- What are the visible changes related to climate in your area?
- What are the existing forecasting capabilities?
- What are the impacts of these changes?
- What are the available mitigation and adaptation tools?



VULNERABILITY ASSESSMENT

Learning Objectives / Outcomes



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VULNERABILITY ASSESSMENT

Learning Objectives

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At the end of this session, you should be able to:

- Describe the "elements at risk" per hazard type
- Define different categories/types of vulnerabilities
- Explain the process of conducting vulnerability assessment






Vulnerability

A set of prevailing or consequent conditions which adversely affect the community's ability to prevent, mitigate, prepare for or respond to hazard event



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Vulnerability Assessment



- A process to identify what elements are at risk per hazard type, and to analyze the root causes of why these elements are at risk

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Categories of Vulnerability



- Physical / Material
- Social / Organizational
- Motivation / Attitudinal

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Physical / Material Vulnerability



- Hazard-prone location of community facilities, livelihoods, infrastructure, basic services
- Design and construction materials of houses and buildings
- Insecure and risky sources of livelihood



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Physical / Material Vulnerability

- Lack of access and control over means of production (land, tools, inputs, animals, capital)
- Inadequate economic skill and techniques
- Dependent economy leaders
- Occurrence of acute or chronic food shortage
- Lack of adequate skills and educational background
- High mortality rates, malnutrition, occurrence of diseases, insufficient coping capacity
- Over exploitation of natural resources



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Physical / Material Vulnerability



- Lack of basic services: education, health, safe drinking water, shelter, sanitation, roads, electricity, communication
- Exposed to violence (domestic, community conflicts, civil conflicts or war)



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Social / Organizational Vulnerability

- Weak family / kinship structures
- Lack of leadership and initiative to solve problems or conflicts
- Exclusion of certain groups from decision-making about community life or unequal participation in community affairs
- Absence or weak community organizations (in formal, governmental, indigenous)

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Social/Organizational Vulnerability



- Conflicts: ethnic, class, beliefs, caste, ideology
- No or neglected relationship with government, administrative structures
- Isolated from outside world

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Motivational / Attitudinal Vulnerability

- Negative attitude towards change
- Passivity, fatalism, hopelessness, dependency
- Lack of initiative or "fighting spirit"
- Dependence on external support

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TOOLS FOR CAPACITY & VULNERABILITY ASSESSMENT

- Semi-structured interviews
- Rapid and vulnerability map
- Community drama
- Towns meeting
- Seasonal calendar
- Institutional / social network analysis
- Problem tree
- Ranking

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TOOLS FOR CAPACITY & VULNERABILITY ASSESSMENT

- Resource map
- Historical profile
- Gendered resource mapping
- Focus group discussion
- Livelihood / coping analysis
- Institutional and social network analysis

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Progression of Vulnerability

Event Factor	Physical Processes	Human Conditions
Lack of resistance to hazards	Rapid population growth	Disaster-prone location
Unequal access to power	War	Unplanned infrastructure
Ecological	Deforestation	Lowland coastal zones
Political and economic systems	Weak local markets	Weak institutional structures for public action
	Epidemics	Disease

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Vulnerability Assessment

- We should recognize that vulnerability assessment is complex
- Vulnerability is specific to location, sector, interest group, etc.
- Vulnerability and poverty are strongly linked

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Group Exercise
Vulnerability Assessment (Hazard Specific)

Setting	Elements at Risk (EIR)	Elements at Risk of Disb.	Characteristics of Disb. that Contribute to Vulnerability
Urban	Buildings, People	Age, sex, disability, income, income	Age, gender, physical health, Social, economic & demographic

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Vulnerability Assessment (Hazard Specific)

Setting	Elements at Risk (EIR)	Elements at Risk of Disb.	Characteristics of Disb. that Contribute to Vulnerability
Urban			

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Vulnerability Assessment (Hazard Specific)			
Category	Elements to Assess	Factors to Assess	Questions to Ask (Consider the Vulnerability)
People	Age, sex, mobility, income	Evacuation routes, access	Age, gender, and mobility, Social, economic disadvantage
Buildings (School, etc.)	Think of occupancy damage		Construction material, design, location, height
Infrastructure (roads, bridges, water, communication, electrical)	Formal structural design		Size, height, design, material, level of design
Industry	Designs building, product, raw materials, stock levels, (chain management)		Size, type of product, type of raw material

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Vulnerability Assessment (Hazard Specific)			
Category	Elements to Assess (Risk to R)	Factors to Assess (Risk to R)	Questions to Ask (Consider the Vulnerability)
Rural	Crops and fodder	Destroyed, put on fire,	Height, water dependent / non dependent
Environment	Damage to vegetation, harm to flora and fauna, damage to water ways, reefs/coral, etc.		Terrain type, nature of flora and fauna
Land	Erosion, salinity, deposits, desertification		Location, elements of soil, terrain
Irrigation system	Deposit of silt, breaking of channels, damage to machinery (like wells, tractors)		Location, design, construction materials
Animals	Injured, died, disease,		Location, characteristics of species, health

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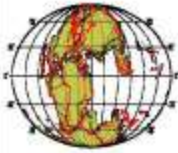


Earthquake Hazard Assessment

Sahid Arif
Project Manager, UNDP
06/10/2001, Islamabad

Different Plates around the World



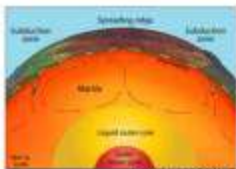
PLATE MOVEMENT

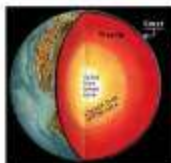
© 2004 Thomson

Plate tectonics

Convection in Earth's interior is like a boiling pot.



The heated magma rises to the surface, spreads and begins to cool, and then sinks back to the bottom of the pot where it is reheated and rises again.



Earth
vs.
Egg



EARTHQUAKES

After energy is released, friction between the adjacent fault blocks prevents further movement. Stress resumes and builds up again. Friction between the blocks is overcome. Another earthquake occurs.



Divergent



- plates are moving apart
- Magma is coming to the surface
- new crust is created

Convergent

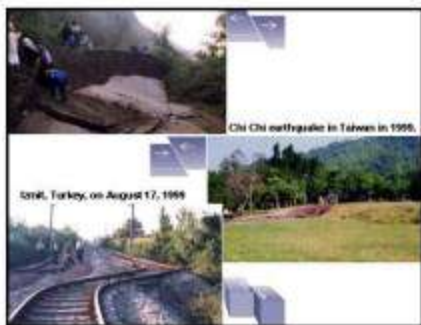


- plates are coming together
- crust is returning to the mantle

Transform



- plates are slipping past each other
- crust is not created or destroyed



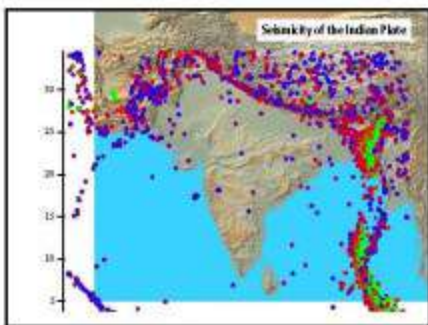


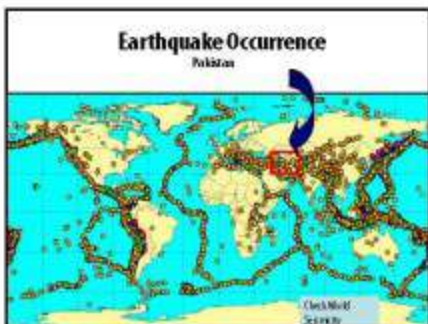
How Many Earthquakes occur Each Year

There are over 500,000 earthquakes annually, but only about 100,000 are felt. The following table lists the size range for each of major quake.

Size (Richter)	Frequency	Frequency per year
Great	5.0+	1
Major	7.0-7.9	18
Large (Major/Minor)	6.0-6.9	100
Minor (Major/Minor)	5.0-5.9	1,000
Minor (Major/Minor)	4.0-4.9	10,000
Minor (Major/Minor)	3.0-3.9	100,000
Minor (Major/Minor)	2.0-2.9	1,000,000
Minor (Major/Minor)	1.0-1.9	10,000,000

From: <http://www.usgs.gov/edu/earthquake.html>, (2001, 12, 12, 10:00 AM) 7/20







Do All Large Magnitude Earthquakes Result in Great Destruction?

Year	Region	Deaths	Magnitude
1905	Tanaka	20,000	6.5
1909	Taipei	1,042	6.9
1909	Mexico	40,000	7.0
1909	Northwest California	47	7.1
1909	Iran	40,000	7.3
1933	Sanfordville	3,745	6.9
1933	Japan	1,000	6.9
1989	Taipei	17,119	7.4
1989	Taiwan	2,287	7.4
2001	India	10,000	7.7
2002	Myanmar	1,000	6.1
2003	Southeastern Iran	30,000	6.8
2004	Sumatra (S & Coastal)	300,136	9.8
2005	N. Sumatra, Indonesia	1,311	9.2
2005	Pakistan	77,000	7.6

Destruction by Earthquakes

Building Damage

DAMAGE/DESTRUCTION PHOTOS















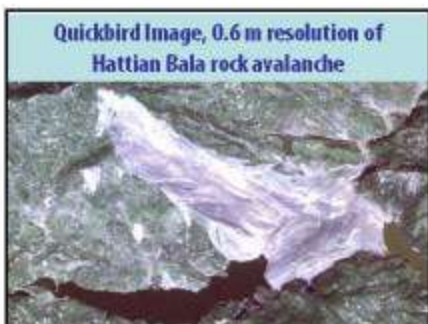
























TRANSPORT



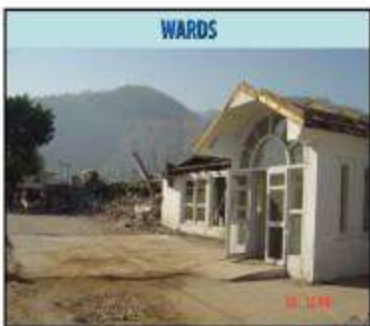
STORES



WARDS









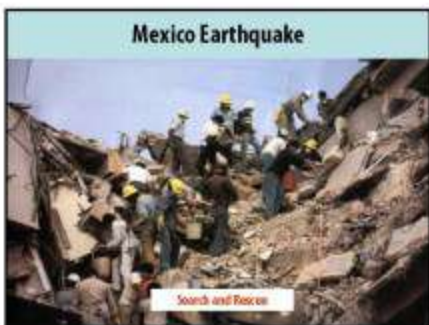
Residential Area











Gujarat EQ

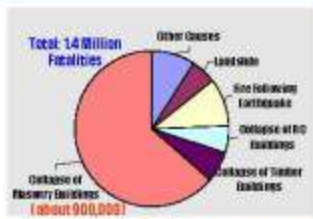


Mexico Earthquake





Earthquake Risk from past experience



Breakdown of Fatalities Attributed to Earthquake

(Source: Earthquake Protection)

Destruction by Earthquakes

Urban Image

DAM



Tokyo 30, 1999

Bridge



Electricity



Tower



Wave animations

Seismic Wave animations

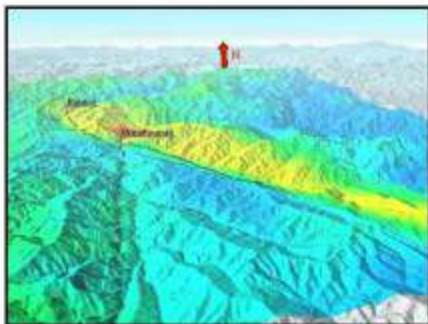
Compressional Wave (P-Wave) Animation

Deformation propagates. Particle motion consists of a series of compressions and dilations. Particle motion is parallel to the direction of propagation (longitudinal). Material returns to its original shape after wave passes.

Shear Wave (S-Wave) Animation

Deformation propagates. Particle motion consists of shearing by transverse motion. Particle motion is perpendicular to the direction of propagation (transverse). Transverse particle motion does have velocity in its own direction however, but this does not lead to any net work of \vec{D} in the material placed in the direction of shear motion. Material returns to its original shape after wave passes.





Anatomy of 2005 Earthquake

- Magnitude 7.6
- Main Boundary Thrust reactivated.
- 73000 deaths and property loss worth 5 billions.
- 1,852 Aftershocks with magnitudes > 5.0 within 45 days
- Affected Area 30,000 sq Km
- 600,000 Houses Destroyed

Overview of Lifeline Damages

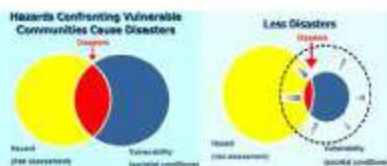
- 588 Education Facilities Destroyed
- 107 Health Facilities Destroyed
- 715 Government Buildings Damaged
- 2,193 km Major Roads Damaged

What is Risk?



$$\text{Risk} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Resilience}}$$

Basic Concepts



$$\text{Disaster Risk} = \text{Hazard} \times \text{Vulnerability}$$

UNEP/WHO/UNEP
2004





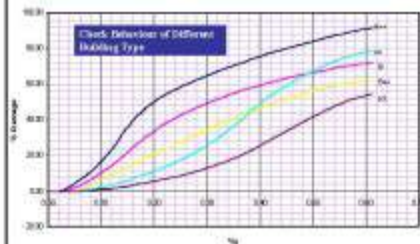


Buildings Inventory: (Tier 1)

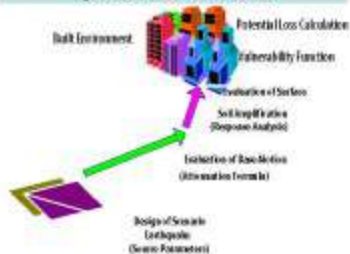
Typology of Buildings

- > A ***: Adobe brick/ stone with Mud mortar
- > B : Brick/Stone wall with cement mortar, more than 3 floors
- > B **: Brick/Stone wall with cement mortar, less than 3 floors
- > K¹ : RCC Framed Building, more than 3 floors
- > K² : RCC Framed Building, less than 3 floors

Fragility Curve



Quantification of Risk



National Building Code (NBC)

Seismic Building Code of Pakistan (SBC 07)

The Seismic Building Code of Pakistan (SBC) has already prepared in 2007 following the 2005 earthquake, it is not yet being enforced.



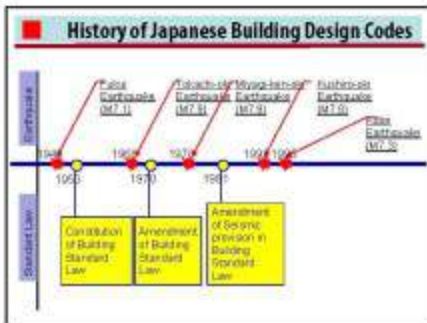
Reduce Vulnerabilities to Earthquakes

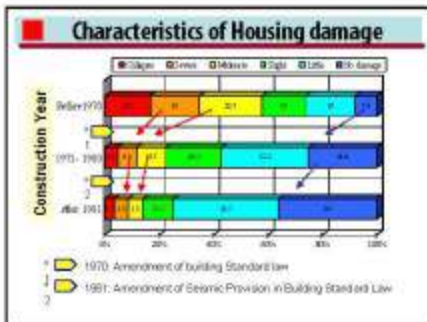
- **New Buildings :** Construct strong, earthquake-resistant buildings according to the Building Code
 - Additional Cost for typical buildings up to 3 stories
 - 4-6% in Masonry (Concrete masonry)
 - 2-4% in frame buildings

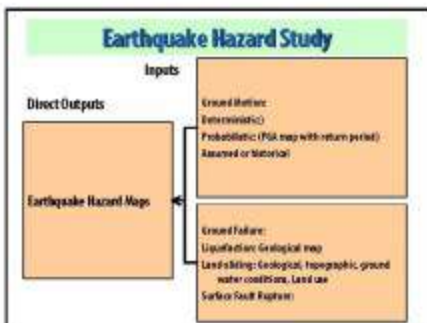


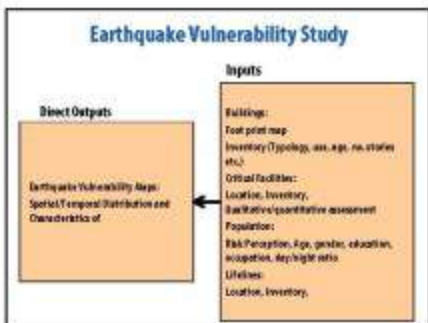
For the disaster mitigation, it is essential to investigate the potential of seismic performance of existing building.

































This condition could be achieved!



This condition can be achieved with little effort!

Very Detail: Identification of Non-structural Vulnerability Reduction Options



Improving Safety of Operation Theaters



Proposed Activities

- Research for detailed seismic hazard assessment mapping & Earthquake Risk Reduction
- Organize Training Workshop for Engineers on structural & non-structural Earthquake vulnerability Assessment (EVA) of public buildings & infrastructures
- Conduct structural & non-structural Earthquake vulnerability Assessment (EVA) of selected hospitals/health & educational facilities and prepare management/mitigation plans
- Conduct detailed Earthquake vulnerability Assessment (EVA) of selected infrastructure and prepare management/mitigation plans
- Organize consultative workshops

Proposed Activities

- Modification/development of guidelines for E2 take into site planning guidelines/training manual on the basis of findings.
- Proactive planning & dissemination of easy-to-understandable guidelines on safe construction (including Stone Masonry).
- Organize Trainings & mock drills of Teachers (above training 30-35 per in DRB)
- Organize Trainings of public officials (two trainings 30-35 per) in E2 for site planning
- Training of Public Officials in DRB & E2 Preparedness (35 formal – 50 training)
- E2 safer construction Training of 400 construction workers/trainees (E2) training 2-3 days total
- Organize seminars on Earthquake Preparedness in each city

Proposed Activities

- Identify mitigation & preparedness structural and non structural measures.
- Implement local level structural and non-structural measures.
- Earthquake vulnerability reduction demonstration projects
- Public awareness/Shareable demonstration, including picnic, training, education and awareness, etc project
- Reconstruction & retrofitting, (54) projects work DRB
- Mitigation infrastructure and services, (54) project
- Emergency response capacity development (54) project
- Conduct special awareness training, and mitigation activities for girls schools, colleges and with women's groups

Proposed Activities

- Develop material and training manual focusing women's role in DRB.
- Formation of DRB network representing DRB, Municipal governments, local BC, civil society, Chh, NGOs, women groups, religious leaders and communities) and Quarterly meetings.
- Develop Local and Community Level Funding Mechanisms for Preparedness and Mitigation Activities
- Organize 3 trainings in emergency response capacity development





Lessons

- ◆ Hazard Mapping and RA can be done at different level/s/country
- ◆ RA as a Powerful City Planning Tool
- ◆ RA has been very Important Awareness Tool
- ◆ Involvement from City/Community Level is Very Important for Proper Utilization of the Outcome.



Mainstreaming Gender in Disaster Risk Management

Workshop

Disaster Risk Management Course for UNDP/ICA
Institute for Women and Disaster Management
Bangkok
6 October 2010





Gender Quiz!!!

What percentage of the World's 1.3 billion people living in extreme poverty are women and girls?

- 50%
- 60%
- 70%
- 80%

Gender Quiz!!!

What percentage of the World's 1.3 billion people living in extreme poverty are women and girls?

- 50%
- 60%
- 70%
- 80%

■ Correct Answer: 70%

Gender Quiz!!!

What percentage of the World's working hours is worked by women?

- 27%
- 57%
- 43%
- 60%

Gender Quiz!!!

What percentage of the World's working hours is worked by women?

- 27%
 - 57%
 - 43%
 - 60%
- Correct Answer: 60%

Gender Quiz!!!

What percentage of property worldwide is owned by women?

- 76%
- 5%
- 9%
- 25%

Gender Quiz!!!

What percentage of property worldwide is owned by women?

- 75%
- 25%
- 10%
- 23%

• Correct Answer: 1%

Gender Quiz!!!

What percentage of junk e-mail is written twice as often by men?

- 90%
- 30%
- 25%
- 50%

Gender Quiz!!!

What percentage of spam e-mail is written twice as often by men?

- 90%
- 30%
- 25%
- 50%

• Correct Answer: 30%

Gender Quiz!!!

What of the following is responsible for the most deaths of women aged 15-44?

- Cancer
- Asthma
- Traffic deaths
- War
- Gender-based violence

Gender Quiz!!!

What of the following is responsible for the most deaths of women aged 15-44?

- Cancer
- Asthma
- Traffic deaths
- War
- Gender-based violence

• Correct Answer: Gender-based violence

Gender Quiz!!!

According to UNFPA, what percentage of reproductive deaths is due to botulism and influenza?

- 1%
- 5%
- 15%
- 20%

Gender Quiz!!!

According to UNHCR, what percentage of refugees are estimated to be women and children?

- 25%
- 50%
- 65%
- 80%

• Correct Answer: 80%

Gender Quiz!!!

What percentage of UNHCR's field representatives are men?

- 25%
- 50%
- 70%
- 80%

Gender Quiz!!!

What percentage of UNHCR's field representatives are men?

- 25%
- 50%
- 70%
- 80%

• Correct Answer: 80% (as of 2015-18-18)

Gender Quiz!!!

What percentage of girls in worldwide classrooms do not have adequate learning materials?

- 20%
- 25%
- 33%
- 50%

Gender Quiz!!!

What percentage of girls in worldwide classrooms do not have adequate learning materials?

- 20%
- 25%
- 33%
- 50%

• Correct Answer: 33%

Gender Quiz!!!

Gender equity comprises:

- Poverty eradication
- Sustainable development
- Realization of HWDOS
- All of the above

Gender Quiz!!!

Gender equality contributes:

- Poverty eradication
- Sustainable development
- Realization of MDGs
- All of the above

- **Correct Answer: all of the above**

Background Information

Being **inclusive** in giving **aid** and **support** to **women** **constitutes** a **factor** in **making** the **assumption** that **women** will **benefit** **equally** from **gender-neutral** development **interventions**.

Support **men** **AND** **women** **to** **build** **back** **better**

Gender dimensions of Disaster Risk Management

- **Differential vulnerability – Impact and related issues**

Gender in Disaster Risk Management



What Gender equity does not mean?
Only women related issues

Then what does it mean?
Equality in preparedness and capacity development of both men and women

What to do?
Special efforts to mainstream activities for gender equity

Gender Mainstreaming..

- It is no longer the 'why' but the 'how' of gender work that needs to be addressed to make it a part of reality.
- Men + women + Men + women does NOT equal Gender Equality!
- Gender Approach is about what happens in structures and not about the numbers that attend.
- Gender linked training is the process of ensuring that women and men have equal access and control over resources, development benefits and decision-making.

Gender Mainstreaming..

- In 1997, the UN system adopted the strategy of gender mainstreaming as a means of attaining gender equality.
- ...meaning that the impact of all policies and programmes on women and men should be considered at every stage of the programming cycle
- From Planning to implementation and evaluation.

Disaster Affects Differentially

How?

- Preparedness, survival, coping strategies recovery

Why?

- One to five people (gender)

What?

- Social, political and economic status
- Ownership of assets
- Exposure to social and other forms of violence
- Human rights disparities

Vulnerability

■ Differential vulnerability –

- Gendered division of labour (stereotyped)
- Access to resources and services
- Economic insecurity, land rights
- Limitation on personal autonomy...

Adapted from the Gender and Disaster Handbook, available at www.unhcr.org/refugees/54100000.html. Copyright © 2009, InterAction.

Differential Impact

Before Disaster:

- Unequal representation of men and women in planning and decision-making
- Women – helpless victims, capacities overlooked and underused

Are we gender sensitive??

- Are we taking into consideration the needs of boys and girls, men and women in planning disaster risk management?
- Do men and women, boys and girls have equal access to information and knowledge for disaster risk reduction?
- Are men and women involved equally in community based disaster risk management activities?
- Are men and women equally involved in decision making bodies and processes?
- What are we doing to secure equal participation and involvement to ensure better preparedness and mitigate vulnerability to disaster?

Gender Issues in DRM

- Gender Based Project Gap:
 - Women – no alternative gender or well targeted needed
 - Men – no alternative or no targeted and/or poorly targeted
- Women's and men's of same social group/class if there are equal opportunities to participate (esp. skills and decision making) in interventions
- Disparties in access to relief and recovery assistance

Gender Sensitive DRM means . . .

- Acknowledging and accounting differences
- Meeting the needs and priorities of men and women, boys and girls
- Information dissemination
- Equity in Access, Opportunities
- Improving gender relations through interventions

Gender Analysis

- Gender analysis allows you to understand who in the population is affected by the crisis? What they need? What they can do for themselves?
- Thinking about the gender dimensions of your work improves what you do, how you do it and what effect you have.
- It is simply about good programming.

ADAPT and ACT collectively

- **ADAPT** gender dimension
 - Design and implement most of all
 - Adapt for women, girls, boys, women
 - Participate equally
 - Do no harm and meet equity
- ACT**
- Action oriented based on the work under programming
 - Inform, engage and mobilize people to do a specific activity
 - Target actions based on a gender analysis

Gender and actions with 4 partners

- **ADAPT** gender dimension
- **ACT** gender dimension



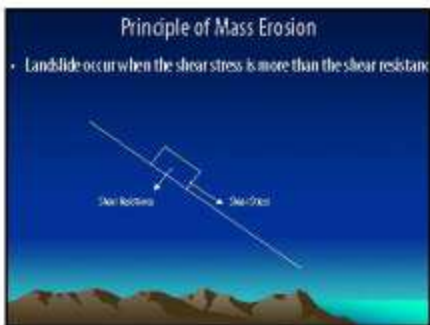
GROUP WORK: Designing Gender Responsive Framework in Post Disaster Situation (Earthquake) in NWFP/FATA

- **Context** - A team of disaster relief workers are at a site to help with the survivors. They have 48 hrs to prepare the relief camp in the next day. It is essential to have camp facilities for women, and the team is not well organized. They don't get the gender sensitive action plan even after 2 days. Some members have helped the people since it is difficult with the camp facilities for relief work and relief resources.
- **Context** - A group of professionals of health care to get the relief work in the disaster to help them to be in the recovery of a group of children.
- **Gender Dimensions**
- **Plan** each gender to plan their plan to be ready. Start giving us questions to the presenting group.









Earthquake deforestation





Transitional Landslide













Land slide Risk Assessment

- Examine the natural factor responsible for Landslides
- Man made factors triggering Landslide
- After study of both the factors Landslides risk can be assessed easily

Factors causing Landslides

A- Natural Factors

1. Geology
 - 1.1 Rock Type
 - 1.2 Stratigraphy
2. Soil Type
3. Clayey soil layer between rock-soil interface
4. Precipitation



Natural Factors -continued

5. Slope
6. Vegetation
 - Role of root system
 - Evapo-transpiration
7. Shallow soil depth on hard bedrock
8. Undercutting of slope by rivers
9. Earthquakes

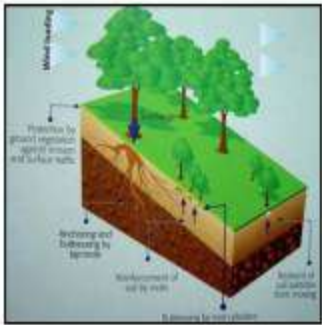




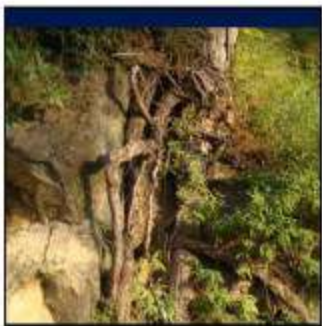
























B- Man Made Factors

- Deforestation
- Road construction
- Earthworks for Habitation & other purposes
- Terracing for crop production
- Irrigation/ Disposal of sewerage water













LANDSLIDE RISK REDUCTION

- AWARENESS PROGRAMME TO AVOID ACTIVITIES CAUSING LANDSLIDES
- AVOID DEFORESTATION
- LAUNCH REFORESTATION PROJECTS
- INCREASE TREE COMPONENT ON FARMLANDS THROUGH ORCHARDS & FARM FORESTRY
- AVOID ROADS ON SENSITIVE AREAS
- IF ROAD IS UNAVOIDABLE CONSTRUCT RETAINING WALL IMMEDIATELY AT THE CUT SLOPE

- SLOPE STABILIZATION SHOULD BE INTEGRAL COMPONENT OF ROADS CONSTRUCTION PROJECTS IN HUMID MOUNTAIN AREAS
- AVOID EARTH WORK WHICH CAN TRIGGER LANDSLIDES
- AVOID DISPOSAL OF SEWERAGE WATER IN SENSITIVE AREAS
- AVOID IRRIGATION IN SENSITIVE AREAS

LANDSLIDE MITIGATION MEASURES

- **ENGINEERING MEASURES**
 - Drainage channels / catch drains
 - Surface drains
 - Subsurface drains
 - Retaining walls
 - Piling
 - Filling
- **SOIL BIOENGINEERING MEASURES**
 - Bioengineering structures: vegetated soil gabions, live brushwood, vegetated geotextile retaining walls
 - Slope protection measures: artificial brush layering, brush matting, brush layering, sodding, hedge-rows
 - Check dams (live brushwood, dead brush, rock, vegetated pole check dams)
- **BIOLOGICAL MEASURES (REFORESTATION)**









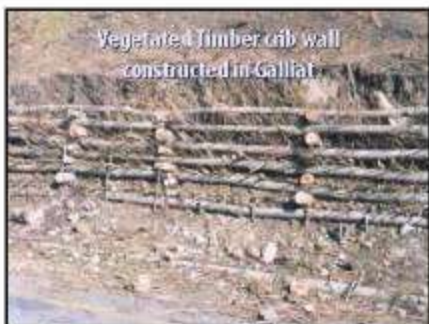




































































Narri (*Arundo donax*) Hedge

Sodding (Horizontal lines)



Sodding (checkerboard style)















Drought Risk Management



Drought Risk Assessment

[Drought Risk Assessment](#)
[Drought Risk Assessment](#)

Session Overview

- **Drought as a Hazard**
 - Definition/Characteristics/Types/Impacts/Impact
- **Drought Risk Assessment**
 - Drought Risk Assessment Cycle
- **Drought Risk Reduction**
 - Preventive Measures

Drought Defined

Insufficient or reduced rainfall over an extended period of time

Drought Characteristics

- Slow-onset, creeping phenomenon that makes it difficult to determine the onset and end of the event
- No universal definition
- Duration varies and may range from months to years
- Spatial extent much greater, impacts spread over large geographical area

Types of Drought

- Meteorological Inadequate and mal-distribution of rainfall
- Hydrological Reduced streamflow, inadequate filling of reservoirs, drying up of surface water storage structures
- Agricultural Low soil moisture and water shortage resulting in crop failure
- Ecological Drought When the productivity of a natural ecosystem fails significantly as a consequence of distress induced environmental damage

Reasons for Drought

- Deforestation
- Indiscriminate boring of tube wells
- Promotion of water intensive cash crops
- Population growth in arid zones
- Climate Change

Drought Impacts on Different Sectors

Economic Sector

- Crop production less
- Dairy and livestock production less
- Timber production less
- Fishery production less
- Less of national economic growth
- Income less for farmers and others directly affected
- Less from recreational business
- Reduced hydropower supply
- Water supply revenue shortfall
- Cost of new/ supplemental water resource development

Social Sector

- Food shortage
- Loss of human life
- Increased poverty
- Population migration
- Water use conflict
- Health-related problems

Environment Sector

- Damage to animal and plant species, wildlife habitat
- Increased inaccessibility to forest and range lands
- Soil erosion
- Visual and landscape quality

Drought Risk Assessment



Drought Risk Reduction

The risk associated with drought for any region/area is a product of the region's/area's exposure to the natural hazard and the vulnerability of societies within the region to the event. There is little that can be done to alter its occurrence, because drought is a normal part of climate. Vulnerability to drought is determined by social factors such as land use, population increase and migration because region to another or from rural to urban areas.

Drought Risk Reduction

Risk Avoidance/Control, Resilience Steps

Risk avoidance – altering agricultural practices, diversification of income sources, to improve resilience

Risk absorption – reducing and modifying consumption, sale of non-productive assets

Risk transfer – dispersing of productive assets, climate migration, releases of income levels

Resilience – Rapid Start-up or Rebuild

Drought Risk Reduction/Presentation/Response

Water Management and Agriculture

- Intensive drive to generate community appreciation of water management and crop life-saving techniques
- Optimum use of all available surface and ground water for irrigation (e.g. minimum seeding of crops by rotation to obtain available irrigation to a larger area)
- Cropping patterns, considering availability of irrigation water and soil moisture (e.g. crops that require less water)
- Continuous coordination between agricultural scientists, meteorologists, irrigation engineers and agricultural field staff to inform and assist farmers to adapt agricultural practices

Livestock Management

- In normal times, formulate special feeding programs based on unconventional feed resources
- In normal times, programs for management in drought-prone areas of vegetation which survives drought
- Maintain extra stocks of vaccines and medicines in veterinary centers and outposts
- Allografts

Enabling Water Supply and Food Security

- Procurement of rigs and other well-clogging instruments for boring or deepening drinking water wells
- Repair of hand pumps
- Transport of water
- Establish national food reserve
- Avoid large-scale maize of locally produced feed items due to an inadequate storage and distribution system
- Maintain an updated list of surplus areas (before the drought occurs)

THANK YOU

Definition of Public Awareness

- The process through which people living in hazard-prone areas
 - Come to understand that they live in areas of risks;
 - Realize the specific dangers that they are exposed to;
 - Understand the warnings that are issued, and
 - Know the appropriate actions to take to protect their life and minimize property damage

What is public awareness

It should advise about:

- means of protection
- means of preparedness
- means of mitigation
- responses to threats

and instruct the public about:

- what
- when
- how
 - ... to do or act in the personal and public interest

Objectives of Public Awareness



- To increase the public knowledge about hazards, their nature and the possible consequences of their impact
- To increase knowledge about practical preparedness measures

Objectives of Public Awareness



- To inform the public about the warning system that will be employed and the means used and what they should do when they hear it
- To increase knowledge on how to respond to an emergency situation
- To mobilize support for disaster plans or response activities

Elements of Public Awareness

- Purpose
- Message
- Means
- Audience
- Intended result

Setting Up a Public Awareness Program

1. Establish the need
2. Planning the program
3. Resource mobilization
4. Implementation
5. Evaluation
6. Improvement of the program

Characteristics of a successful campaign

- **Should have long term strategy and approach to repeat**
- **Should consistent and reliable**
- **Utilizes a wide variety of methods , tools and media**

Key Issues

What information	Content
How to Convey	Format Channels Media
Who will Do	TaskingResponsibilities
When	Time
How to Sustain	Interest Involvement
Expenses	By whom

How can information reach the public

- Government programs which deal specifically with disaster prevention/Mitigation & preparedness
- Training programs which could include a module on disaster preparedness
- Radio talks and short feature broadcasts
- Verbal and pictorial messages (telephone
- Directories, and mass transportation)

How can information reach the public

- Cartoon series or short illustrated stories (comic magazines)
- Posters and billboard notices
- Films (closed- and open-circuit showing), film clips and videos
- Meetings (formal and informal) and other community gatherings

Tools and options for creating awareness

Community-Based Disaster Mitigation



Village Disaster Management Planning with Communities

Flood Mapping

The community was asked to draw a color line to the water level for the highest tides and lowest tides. This helped in identifying the extent of village. Arranged houses along streams and moderate flows.

Accessibility Map

A route map is drawn up, which indicates a network, around the village, to ensure, through such a network, that all the people in the village are fully or completely reached.

Village Disaster Management Planning with Communities

Social Mapping

The community mapped the social distribution of numbers of households, coffee, common spaces, schools etc.

Basic Services Mapping

The community identified where basic household services occur by topic, services such as information from Radio/TV, Books, Vehicles, Community and Private households etc.

From risk assessment to road safety with the Yemen Red Crescent Society

From risk assessment to road safety with the Yemen Red Crescent Society
LESSON LEARNED

- The relation between the schools involved in the project and the local community became stronger.
- The schools again began to take the students on excursions (for example, trips to local factories and on picnics).
- Red Crescent groups in schools were reactivated.
- The relationship between these schools and the traffic police was strengthened.
- The teachers in these schools received training in road safety activities and first aid.
- YRCS branches and the schools organized an exhibition on road safety.
- One of the private schools proposed to integrate the road safety project in its curriculum.

Sample of community based interventions



Initiatives for Safer Construction in Indonesia, Nepal, Sri Lanka, Vietnam

Public Awareness, Education, Training and Technology Transfer



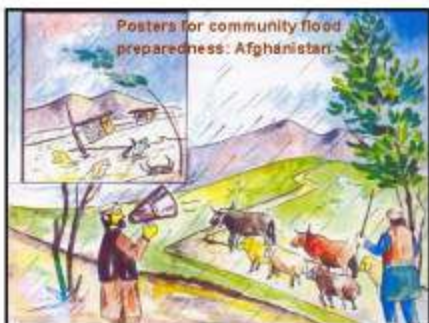
Landslide mitigation through CBDM approach in Sri Lanka

Improving infrastructure in Bangladesh and Cambodia

Structural and Non-structural Measures

Posters for community flood preparedness, Afghanistan









Training Workshops

Training workshops and lectures are good for professionals and the literate, hands-on experience is necessary for the illiterate such as masons



Training- hands-on experience



Masons receive graduation certificates at the hand-out ceremony of Kennethi Lower Secondary School

LEAP includes a combination of public meetings and hands-on demonstrations

Capacity Building



A mix of informal hands-on demonstrations, education and formal training courses

Training of informal groups



Disaster safety days



Disaster safety day activities



Posters, Billboards, flyers, murals, brochures



**Posters, Billboards, flyers, murals,
brochures**



Booklets, Brochures, Posters, Radio, Jang, Television, T-shirts



Demonstrations



DRILLS



Knowledge Networking through dissemination using Case studies, news letters, web sites

- Promote replication of successful mitigation measures
- Package and disseminate knowledge using different media
- Support partners in accessing knowledge
- Strengthen networks and partnerships



Leaflets, brochures, safety pamphlets, games



मरम्मत और मजबूतीकरण

For more information and design methodology visit

➔ Distributing safety leaflets can be a rapid and effective means of spreading an awareness message to local communities. Target groups: Local People / Local Worker

➔ Providing low cost messages for building earthquake resistant and Drought Resistant



भूकंप सुरक्षित घर

For more information and design methodology visit

Exhibitions



School programs







Educational Material Produced

Calculation on Safe Building Construction

ICPC developed standards in collaboration with IEST, Max, Leela Institute of Disaster Mitigation and Management Centre, Gurukul Kangri (Dehra Doon)

Project led by I-Cell Group

Task of group: Govt. Government's Non-Government Organizations, Mumbai

Thanks for reading services

Meetings and community activities



Bataspur District Safety Day Activities - 5th April 2001



Monument erected in memory of those who were killed in 1991 landslide

Prayer held to the Monsoon at the request of the request of the factory of Mr. Gopalan, Davao

Workshop where people were taken to the field to see the safety of others in the field of 200

School children participate in the work

Cultural events, public drama and street play



Lessons Learned

- Gain ownership and trust of the community
- Use influential people/opinions in order to provide publicity
- Trainers, trainers and contribution all have a stake
- Aim both public and private for support as possible
- Create potent volunteer base
- Make Trainer Training course as short as possible
- Integrate risk management through simulations, on-site visits to hazard processes, case diversity, communication logs etc.

Lessons Learned

- Use existing systems, customs, laws, practices and institutions
- Integrate into school
- Tailor-made workshops and messages to suit the target audience
- Combine formal and informal approaches
- Highlight the funding needs to national and international sources of funding so that campaigns are not prematurely ended
- Undertake sound preliminary research
- Maintain quality control in translations
- Use consensus building or an enabling approach, which is better than confrontation in a domain in certain cases where support of influential industries or stakeholders is vital



Tilly Smith

BRITISH girl aged ten saved 100 tourists from the tsunami ? thanks to a geography lesson.

Tilly Smith, who studied the huge waves in school two weeks before Christmas, realized a Thai beach was about to be swamped when the tide shot out.

Reminder

- Risk Communication is not a once and for all thing. It is something that has to be repeated at regular intervals.
 - **People Forget:** If an event does not affect them particularly for some years.
 - **People Change:** New people come into a community.
 - **People replace:** (Taking away community memories), young people grow up and old generation will die.

The Next Disaster occurs
when the **EARLIER
DISASTER**
is
FORGOTTEN

Exercise

Designing a Public Awareness (IEC) Campaign at the Community Level

Instructions:

Your group is an NGO working in a rural community in a district 500km from the capital Islamabad. This community faces a number of hazards and your NGO is designing a public awareness campaign in the community focussing on:

- a) Group 1: Flood
- b) Group 2: Landslide
- c) Group 3: Earthquake
- d) Group 4: Drought

You have 15 minutes to address the following issues:

- 1) Who is the audience?
Identify 6 key target groups within this audience and select 2 target groups to focus your campaign on
- 2) What is the message you want to convey? (Develop a pre- disaster message)
- 3) Which methods will you use to reach your selected target group?
- 4) Who is 'we'? (Define who should carry out the campaign?)
- 5) What will it cost? And where will the money come from?
- 6) What are the other key considerations?

Emergency Response Management:

Principles and Concepts

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Scope of the Session

- Aims and scope of emergency response management
- Identify key response management activities



Emergency Response Management

- **Emergency**

An extraordinary situation in which people are temporarily unable to meet their basic survival needs, or there are serious or immediate threats to human health and well-being.



Response Management

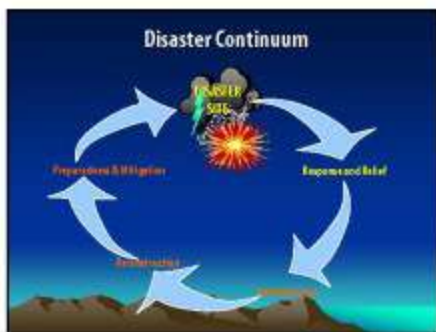
- Response management is the process of dealing with the problems which arise when an emergency event impacts.
- Response management requires to:
 - Identify the range of problems occurring
 - Generate appropriate solutions to identified problems
 - Implement agreed solutions
 - Monitor and review the situation and the actions being taken

Emergencies

- Some examples:
 - I can't find my mobile phone
 - My son hasn't come home from school
 - A man is having a heart attack
 - A plane is about to crash
 - Gas is leaking from a factory
 - Floods occurring
 - Terrorism

Disaster Continuum





Emergency Response

Aim:

To reduce mortality rate and damage to property thereby reducing the impacts of disaster and to ensure successful recovery of maximum number of people

- ### Characteristics of an emergency
- Relatively unexpected
 - Many urgent and significant tasks involving injuries, deaths or property losses
 - Large number of personnel and agencies
 - High levels of public interest and/or controversy
 - Mishandling of information
 - Some tasks are overlooked or under-resourced
 - Some tasks are over-resourced
 - Some of the available resources are not used

Emergency... A Special Situation

- Normal procedures may be inappropriate or inadequate to deal with emergency situations
- Special procedures, systems and mechanisms are needed to ensure that all emergencies can be managed
- Extraordinary powers may be given to specific people (organizations) for a limited time



Scope of Response Management

- Combat the effects of the emergency
- Rescue persons trapped or in danger
- Treat casualties
- Reduce further damage to property
- Assess damage and needs

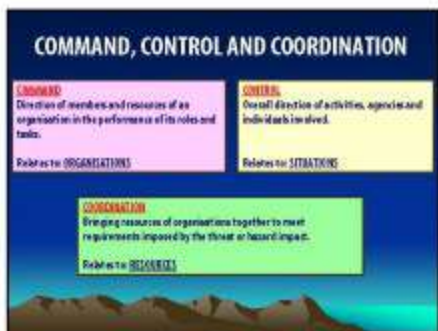


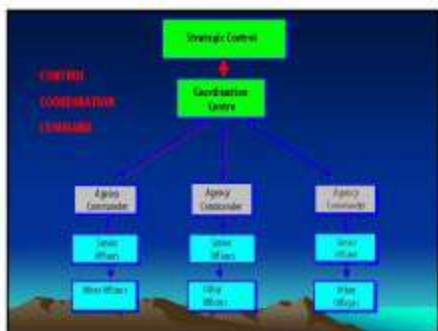
Scope of Response Management (cont.)

- **Begin the restoration of lifelines and key facilities**
- **Provide information to the public**











Emergency Response Management: Principles and Concepts

Emergencies can take many different forms, but whatever their cause they usually result in harm to organization, and the wider community. People can be at risk in an emergency, but so too can organizational and community assets such as buildings and equipment.

What is an Emergency?

- A critical event, which carries the potential to severely disrupt the functioning of an organization or a community

What is Response?

- Actions taken immediately following the impact of a disaster or emergency to manage the problems occurring.

What are Response Activities?

- Warning
- Evacuation
- Search and Rescue
- Medical Treatment
- Firefighting
- Relief (provision of basic human needs)

Warning

- About potential emergencies, and actions people should take to avoid loss due to the prevalent hazards/disasters
- Time frame – depending on the type of disaster, it may provide long, short or no warning at all. This will influence effectiveness of response effort
- Trust, credibility and reputation of the Warning Authority is essential in order to mobilize people successfully

Evacuation

- Evacuation is a five step process of:
 - Warning
 - Movement
 - Route
 - Shelter
 - Return

Search and Rescue

- Locating and rescuing people trapped in collapsed buildings or debris and other installments when they are in danger

Medical Treatment

- Onsite medical first aid
- Triage

- Transportation off affected to hospitals

Firefighting

- Fire can occur in buildings, forests, houses or shelter
- It can also occur in industries as a secondary hazard

Relief

- Actions or measures taken to meet short-term basic human needs of shelter, water, food, clothing, healthcare and information.

Basic Human Needs of Survivors

- Water
- Clothing
- Shelter
- Sanitation
- Food
- Information
- Psycho-social and trauma assistance

Characteristics Apply to Response

- Type of emergency
- Severity and extent of emergency
- Ability to pre-impact action
- Capability for sustained operations
- Identification of likely response requirements

Problem Areas

- Inadequate preparedness
- Warning factors
- Slow activation of the response system
- Effects of impact and crisis pressure
- Difficulties in damage and needs survey
- Inaccurate information from survey
- Poor information management
- Inadequate relief commodities
- Logistics problems
- Poor coordination of response operations
- Problems with media

Risk Management is fundamental to good Emergency Management

Steps to Risk Management:

1. describe your context;
2. identify risks;
3. analyze and prioritize risks;
4. control risks;
5. continually improve.

The steps should be carried out one-by-one, but they can be revisited at any time. The results of each step should be recorded for later use, and these records should be retained as a reference to prove that you have carried out the necessary work. The documents will also be useful for continual improvement

1 - Describing your context

Your context consists of all of those things that influence the life and operations of your community, organization or government. A thorough understanding of the context will help to focus your risk management work and make it relevant.

To describe your context, you should answer such questions as:

- What services do we provide?
- Who are our major stakeholders? What do they expect of us?
- Who is our workforce? What skills do they have?
- Who are our major partners? What risks do we pose to them?
- What is the strategic direction of our community? What will we be doing in the next 5 years?
- What legal obligations in regard to safety and reliability does our community have? What are the penalties if we do not fulfill these obligations?
- What authority do we have to undertake risk management? To whom do we report the results of our work?
- What aspects of our community influence the risks we face, and the way in which we will manage them?

As with all of the steps in risk management, the description of your context should be briefly documented and kept for later reference.

2 - Identifying risks

A risk consists of two components:

- an element at risk; and
- a source of risk.

Elements at risk - things that your organization or community values, and which could be exposed to harm. Determine what these things are, and list them for later reference.

Elements at risk can include:

- members of the public
- staff;
- facilities and infrastructure;
- equipment;
- sources of livelihood;
- income or budgets;
- continuity of service
- organizational image.

Some of the more complex or important elements at risk can be sub-divided to allow a more detailed analysis.

People at risk could be divided by:

- gender, age, class, caste
- sources of livelihood
- relative exposure to risk.

Once listed, these elements should be described in a standardized method and communicated to all those working on risk management. This is to ensure consistent analysis and results.

Sources of risk are the hazards that may cause harm.

Ways of determining sources of risk:

- Researching or remembering recent community, national, or organizational history;
 - Comparing the situation of one region to other regions with known risks;
 - Developing 'what if' scenarios by imagining possible harmful events and considering what the consequences might be;
 - Conducting surveys of staff and clients;
 - Site assessments.

Sources of risk could include:

- Natural hazards – typhoon, storm surge, strong winds, flood, landslide;
- Biological hazards – contaminated water, food poisoning, infectious disease;
- Social hazards – terrorism, crowd crush, bomb threat;
- Mechanical hazards – structural collapse, vehicle accident, fire in structures, vegetation and other materials;
- Technological hazards – chemical spills, toxic gas release, explosion.

Assessments should be conducted to determine the possible elements at risk and sources of risk.

Ways of Recording Elements at Risk

- Matrix for risk assessment

The matrix such as the one below could be useful for carrying out site assessments. This matrix is an example only and will need extension for different risks and activities.

Where an element at risk may be affected by a source of risk, a brief description of this effect should be made, for example:

I.e. "In region/area 'A' there is a risk of people being injured by the release of a toxic gas."

3.e. "In region/area 'B' there is a risk of structural damage to buildings from strong winds."
 These brief descriptions, known as 'risk statements' can be entered onto a risk register (see Annex 1 for an example).

A partial example of a risk matrix

Elements at risk	Sources of risk				
	a. earthquake	b. drought	c. flood	d. civil conflict	e. fire
1. people	✓	✓	✓	✓	✓
2. livestock	✓	✓	✓	✓	✓
3. buildings	✓	✓	✗	✗	✓
4. equipment	✓	✓	✗	✗	✓
5. (etc)

3 - Analyzing and Prioritizing risks

Prioritizing risks involve sorting the risks into an order of seriousness.
 One way to do this is to consider the relative probability and consequence of each risk.

Probability is the likelihood that something may happen in the future.
Consequence is the degree of harm that a risk may cause.

This allows you to determine which risks require immediate action.
 An example of how to describe **probability** is shown in the following table.

Category	Description
Certain	known to occur often – 2 times a year
Likely	may/has occurred – every 1-2 years
Possible	could possibly occur – once every 5-10 years
Unlikely	unexpected to occur – perhaps once every 100 years

An example of how to **describe consequence** is shown in the following table.

An example of describing consequence

Category	Description
Minor	some equipment or building damage
Moderate	some injuries, significant building damage, some loss of revenue
Major	serious injuries, some buildings destroyed, significant financial loss
Disastrous	some fatalities, key buildings destroyed, serious loss of image
Catastrophic	many fatalities, many key buildings destroyed, community viability threatened, devastating loss of image

All risks should be prioritised using the same probability and consequence categories in the same way. For example, flood frequency must be described in the same way as fire frequency.

Once each risk has been assigned a probability and consequence category, it can be prioritised using the following table.

An example of describing risk levels

	consequence				
probability	minor	moderate	major	disastrous	catastrophic
Certain	medium	high	High	very high	very high
Likely	medium	medium	High	high	very high
Possible	low	low	medium	high	high
Unlikely	very low	low	medium	high	high

For example, using the above table:

For Community X

Source of Risk: Earthquake

Probability: Unlikely

Consequence: Disastrous

Risk: HIGH

By combining likelihood and consequence, you can assign a level of seriousness to a given risk. This will indicate the types of actions that may be required.

Senior decision-makers can assign any given risk to a risk level of their choosing, based on governmental or national priorities or other information that they consider relevant at the time.

All of the above tables are examples only, and it is the responsibility of risk assessment teams, in consultation with other teams, to determine how each category of probability and consequence should be described, and how risk levels will be described.

4 - Controlling risks

Controlling risks is about doing all that can be reasonably done to reduce risk to a level acceptable to the government and the people. Those risks that have been prioritised as very high or high in level in the previous step will probably need to be addressed first.

There are many ways of controlling risk, some of these are:

- transferring the risk
(for example by allocating responsibility to another organisation or through insurance);
- reducing probability
(for example by excluding ignition sources from buildings at a high risk of damage from fire);

-
- reducing potential consequence
(for example by developing a an emergency plan);
 - removing the source of risk
(for example by replacing a hazardous material with another material that is less dangerous);
 - removing the element at risk
(for example by evacuating people from very hazardous areas);
 - using personal protective equipment
(for example ensuring safety helmets are used in hazardous activities).

Many risks will already have existing controls. The degree of appropriateness of these controls and the need for other controls should be assessed as part of this step. For example, a building at risk of damage from fire may have in place a fire detection and suppression system consisting of:

- A fire control panel;
- Heat and smoke detectors;
- An automatic sprinkler system.

If the building were assessed as a medium or high fire risk, it might be worthwhile to reduce the risk by ensuring that other aspects of fire safety were in place in the building such as:

- A regular inspection and maintenance system for the fire detection and suppression system;
- A written and tested evacuation plan;
- Person competent to implement the evacuation plan;
- A public address and warning system;
- Clearly visible and understandable evacuation instructions and clearly marked exit routes.

Expert advice could be obtained to assist with determining how to control risks in specialist areas such as fire protection, hazardous materials, earthquake, wind and storm damage.

Existing risk controls, as well as proposed new risk controls, should be entered into the risk control summary table (annex 1) identifying:

- The person or organisation responsible
- Deadlines for carrying out the activities.

Decisions can then be made as to which new risk controls should be implemented, by whom and by when. The risk control summary can then be used for tracking implementation of risk controls, and subsequently used to record improvements, as described in the next section.

5 - Continual improvement

As the steps of risk management are followed, you should continuously document the work.

Monitoring of the risk management process is required to determine if the work:

- is being performed to an appropriate standard and within time and resource constraints; and,
- is consistent across different agencies to ensure that different facilities or services are being assessed for risk in the same way and will therefore be comparable.

Continual improvement also involves assessing risk management work practices, to ensure that lessons are learned from their application and appropriate improvements are made.

As further risk controls are implemented, and changes to elements and sources of risk occur, a reassessment of risks and risk levels will be required. There will also be a need for a complete review of risks and their management every 1 or 2 years.

Risk management is a continuous process that should be integrated with all work practices. Emergency management is one of those work practices, and must be considered within the risk management plan along with all other activities.

Introduction

This simulation exercise is prepared for the entrance level trainees of the Civil Services Academy (CSA)¹. The Trainees of Civil Services Academy would serve in different government departments after completion of their training at the academy. Such departments may include district management group, police, railways, customs and others. Particularly, as members of the Disaster Management Group, they would have to organize response to disasters in the areas under their jurisdiction.

Under the new arrangements, the government of Pakistan has notified the establishment of District Disaster Management Authorities (DDMAs) at the district levels. District NAZIM is the Chairman of DDMA, while DCO is the secretary ex-officio. Many trainees of the CSA are expected to either become DCOs, police chiefs or the officers at the district level during their careers. The DDMAs are responsible for mitigation and prevention of disasters in the districts. An important function of the DDMAs is disaster preparedness and response. At the time of disasters the DDMAs are expected to organize the disaster response through activation of the District Emergency Operations Centre (DEOC). The DEOC is composed upon representatives of all district level departments and stakeholders.

The purpose of this exercise is to provide a hands-on opportunity to the CSA trainees to simulate a disaster response. It is believed that the simulation would help them acquire the knowledge and skills that would be needed by them in times of disasters as responsible officers. The exercise is developed within the framework of Local Government System, under which a politically elected NAZIM is the overall in-charge of district administration, while the most senior bureaucrat in the district, the DCO runs the administrative affairs on a day to day basis.

The exercise is organized around response to an earthquake event, which has affected the district and adjoining areas. The participants act as district officers, representing different departments; e.g. health, education, police, fire services, revenue, civil defense, social welfare, information etc. A few of them also represent the offices of DCO and the NAZIM. They simulate a disaster response under the aegis of the DEOC.

The exercise would provide an opportunity to participants to go through a first-hand experience about the key issues and challenges in disaster response. These include relief management (mobilization, receipt, stockpiling, sorting, transportation and distribution), Health (first aid, triage, transportation to hospitals, burial of the dead), Search and Rescue (SAR), Information Management, Media Management, Establishment and Management of Internally Displaced Persons (IDPs) Camps and Coordination with donors, NGOs, UN etc. The exercise would also provide an opportunity to understand as to how the district departments would possibly interact with each other in times of any emergency at the district level. The total duration of the simulation, excluding theoretical sessions, is about 3 hours and 30 minutes. After the completion of the simulation, the participants will sit in a plenary and undertake debriefing. They would discuss their experience as members of various departments and the challenges they faced. They would then identify lessons so as to organize an effective disaster response, through improved preparedness.

¹ The exercise may equally be useful for government officers at the district level.

How to Conduct the Simulation

1. Duration

7 hours 30 minutes spreading over 2 days

2. Stationery, Equipment & Furniture:

- Colored Maps of Mansehra District
- Copies of Tasks & Action Points
- Flip Charts and Markers
- Cameras
- Correspondence Trays
- Tent Cards Carrying Names of Each Department / Organization
- Computer & Printer
- Partition Material¹
- Office Tables and Chairs
- Meeting Table

1. Give orientation to the participants about the following topics prior to the SIMULATION³ on day-1:

- a. Disaster Risks in Pakistan;
- b. National Disaster Management System;
- c. Basic concepts (Hazard, Disaster, Vulnerability, Capacity, Preparedness, Response);
- d. Mitigation Framework;
- e. District Emergency Operations Centre

2. On the 2nd day of the orientation, give simulation introduction and select, from amongst participants, the District Coordination Officer (DCO), the District Nazim, EDOs and their support staff / junior officers according to the simulation format. Each of the EDOs could be accompanied by two-three staff depending upon the number of participants. Attach two staff with the DCO. Attach one assistant with the NAZIM. (20 minutes)

3. Hold a 10-minute meeting with DCO and Nazim and brief them about the exercise. Give them Roles, Information Sheets and map of Mansehra district. During this time, ask other participants to have a quick look at the Emergency Response Management session given in the source book.

4. Both the DCO and the Nazim hold the first emergency meeting with EDOs and inform them of the preliminary damages and destruction caused by an earthquake that jolted Mansehra District in NWFP. DCO will provide Roles, Information Sheets and a map of Mansehra district to each EDO. (10 minutes)

5. EDOs are asked by the DCO to prepare department-specific emergency response plan in line with their respective roles. It will be a 3-day plan to be prepared in 40 minutes

¹ Partition material is required in case separate rooms are not available as offices for each participating district departments, NGOs and media etc. Partition can be done by putting thin wooden sheets in a way that all departments / organizations feel separated from each other.

³ Simulation time on day-2 is 4 hours 30 minutes

6. The DCO will hold another meeting to discuss department-specific emergency response plans prepared by EDOs. S/he will give input to draft plans. (20 minutes are required for this meeting)
7. All the district officers go back to their work stations and start implementing the response plan after necessary revisions. (1 hour is dedicated for the execution of the plan)
8. The DCO will call a second meeting with district officers and take stock of the current situation. District officers will share problems they might have faced during the first 24 hours. They may put forward any other requirements for a better response (20 minutes).
9. After the meeting, the district officers will go back to their work stations and restart plan execution for another 1 hour.
10. The District NAZIM will finally organize a Media Briefing to brief journalists⁴ about the situation and response efforts of the district government. He will provide facts and figures in this regard (20 minutes)
11. After the media briefing, a debriefing session shall be organized by the Directing Staff to assess the strengths and gaps of the simulation (10 minutes).

Logistics for Simulation

1. For conduct of the simulation, organize seating arrangements for nine EDOs and one for the DCO in a big training hall. This can be done by putting partitions in-between so as different departmental EDOs could maintain their departmental privacy during the simulation.
2. Organize seating arrangements for the NAZIM in a separate room.
3. If possible arrange inter-com telephones for the departments to communicate with each other. In the absence of intercoms, all departments will have to communicate only through written medium.
4. At least five staff will be needed to organize the simulation. One Exercise Director and One associate Director. These two will be technical professionals, who are knowledgeable about disaster risk management and the system of disaster management authorities at district level in Pakistan. Two people would be needed to act as messengers (go-betweens) for sending messages from the directing staff to the NAZIM, DCOs and the EDOs to stimulate action. Another additional staff shall be arranged to meet any unexpected requirements during the simulation.
5. All simulation materials shall be xeroxed before hand. It would be good to organize a Xerox machine during the simulation so that copies could be made if need be.
6. "IN" and "OUT" trays shall be arranged for each department so as to receive and send mail with the help of messengers.

⁴Two or three officers may act as journalists

Task of District Nazim

Introduction

You are a District NAZIM of Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awakened to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that the whole Mansehra district as well as adjoining districts has been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. As Political Head of the district, you ask the DCO to immediately activate the District Emergency Operations Center (DEOC). The DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). In your capacity as the Chairman DDMA you are head of the DEOC. You have asked the DCO to organize response and relief operations under your close supervision. EDOs of health, works, revenue, education, social welfare, civil defense, police and fire services and the district information officer are members of the DEOC on behalf of their departments in order to organize the response.

Task:

Being the political figure of the district you have the overall responsibility for success of the relief and response operation. To ensure that needs of survivors are addressed properly, you may undertake some or all of the following actions.

- Hold meetings with the DCO to take decisions about disaster response
- Coordinate relief and S&R with PDMA and other stakeholders such as INGOs, NGOs, CBOs, public sector departments etc.;
- Enquire the DCO to keep you informed about the status of response operations
- Receive reports from the field about the impact of disaster;
- Inform the DCO about the areas, which are neglected and needs to be reached
- Hold press briefings jointly with the DCO to inform the media about government's response efforts
- Request provincial government (*Provincial Disaster Management Authority-PDMA*) for provision of essential support to the district government, if needed.

Time:

Simulation: 120 minutes

Note:

You might receive information from the field during the simulation, based upon which you may have to revise your decisions or take new decisions.

Information for District Nazim

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

The district has a total population of 1,152,839 (1998 Census) or 143,970 households; female population is 580,958 or approximately 50.39 %, male population is 571,881 or 49.60 % of the total population. Population density is 252 persons/square kilometer. 45.5% of the population is aged below 15 years, while 50.6% are aged from 15-64. 3.9% are over 65 years old. 94.7 percent of the population lives in the rural areas. Mansehra is home to a diverse group of people, ranging from Afghan refugees, Turks, Pashtuns, Hazara, Kashmiris, Hindko, Tanolis, Rajputs, Swatis and Arians among many other ethnic groups.

There are also religious minorities. You are concerned that all affected sections of the society shall receive assistance irrespective of their caste or religion. You are aware from your own sources that there are many communities located in the remote areas on mountain tops and isolated regions. You are especially concerned that aid shall reach those remote communities. It will not be possible to provide assistance to those villages through normal transportation channels, since roads are blocked and in some cases no road networks existed before the disaster.

You have sent your own personnel to verify the situation in those far off villages, who have confirmed the impact of disaster. Based upon this confirmation you want the DCO and other government agencies to take special steps for dispatch of assistance to those communities.

Being the chief of the district you have advertised your phone number and asked the affected people to register with you any complains about relief assistance or if certain groups were ignored in relief and response efforts.

You want the DCO to keep you informed about how much aid has been received from the foreign countries as well as what has been received from the federal government.

Task of District Coordination Officer

Introduction

You are a District Coordination Officer (DCO) in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awoken to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. After consultation with the District NAZIM, you issue immediate orders for activation of the District Emergency Operations Center (DEOC). DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). District NAZIM in his capacity as Chairman DDMA is official Head of DEOC. However, he has made you responsible for management of response and relief operations.

You have asked the EDOs of Health, Works, Revenue, Education, Social welfare, Civil Defense, Police and Fire Services to join the DEOC and help in management of relief and response operations. Realizing the need for information management and media coordination, you have also asked the District Information Officer to act as the Media Liaison Officer.

Task:

As the Operational Head of DEOC you will lead the disaster response and relief operations. In this regard, you will undertake following actions.

- Activate the DEOC with approval from the NAZIM
- Organize Response Coordination meetings regularly at the DEOC to be attended by all above EDOs and representatives of Army, NGOs, UN and donors. In simulation every 20 minutes represent one day. The relief operation will be run for three days duration. You will call a meeting at the start of the simulation, which should not last for more than 15 minutes. Later on you will call the second meeting 20 minutes after the end of first meeting. This meeting will last for 10 minutes. You will call a third 10 minute long meeting if need be, 20 minutes after the end of second meeting.
- Finalize the compensation policy for dead, injured, damages to houses, live stock, crops etc. in consultation with District Nazim.
- In consultation with District Nazim, send request for military deployment in identified areas.
- Establish and manage IDP camps.
- Identify appropriate locations to be used as helipads.
- Identify the areas which are worst affected.
- Identify relief and response priorities that need to be addressed by District Government.
- Analyze resources that are available with different departments and stakeholders.
- Take decisions on deployment of resources in different affected towns, and villages
- Assign responsibilities to various departments and stakeholders
- Monitor progress on implementation of relief and response activities

- Make arrangements for receipt, stockpiling and distribution of aid received from individual citizens and from International donors and countries.
- Organize media briefings on the relief and response efforts of the District Government
- Keep the NAZIM regularly informed about the status of operations and hold consultations with him about important decisions.

Time:

Simulation: 120 minutes

Note:

You might receive information from the field during the simulation, based upon which you may have to revise your decisions or take new decisions.

Information for the DCO

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbottabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

The district has a total population of 1,152,839 (1998 Census) or 143,970 households; female population is 580,958 or approximately 50.39 %, male population is 571,881 or 49.60 % of the total population. Population density is 252 persons/square kilometer. 45.5% of the population is aged below 15 years, while 50.6% are aged from 15-64. 3.9% are over 65 years old. 94.7 percent of the population lives in the rural areas. Mansehra is home to a diverse group of people, ranging from Afghan refugees, Turks, Pashtuns, Hazara, Kashmiris, Hindko, Tanolis, Rajputs, Swatis and Arians among many other ethnic groups.

Although you are an experienced DCO, however, this is your first time to organize a disaster response. You are little nerves. Being a good natured person and a highly competent professional you want to make sure that nothing goes wrong. You want to do everything possible to provide all basic services to the affected people.

Although you have been working with the district NAZIM for about two years, however, you don't like his certain attitude.

Immediately upon activation, you organize the meeting of DEOC to coordinate the disaster response by all district agencies and stakeholders. You want them to inform you what ever information they have about the disaster damage and losses, as well as the resources they have to put at your disposal for organizing disaster response. A MAP OF THE MANSEHRA DISTRICT IS AVAILABLE, WHICH YOU WILL NEED TO REFER TO FOR ORGANIZING THE RESPONSE. The map shows the damage to road network the health, education, works and telecommunications infrastructure. It also indicates areas which did not have access to road network before the disaster and which are affected.

You inform all the EDOs and other stakeholders that they need to coordinate and collaborate with each other to jointly respond to the disaster; e.g. health department will need assistance from the district police and revenue to organize transportation of its personnel and medicine to the affected areas. Education department will provide its facilities to the affected people to take refuge while health, works and revenue departments would need to provide water and sanitation services there.

Due to widespread damage and destruction in the district you realize that without the military assistance for the first one week of emergency response it would be very difficult for other responders to be effective enough. For this, you need to talk to the District Nazim and with his approval send a military deployment request to the concerned office.

You have asked the District Information Officer to be available to the DEOC and work closely with the DCO office to prepare briefs on the field situation as well as about the response efforts of the government. You want the DIO to send briefs to media on a regular basis and also organize Press Briefings for you and the NAZIM as and when required.

You ask the EDO revenue to keep track of the assistance being received from various sources; e.g. private individuals, provincial, federal governments, international donors, UN, and NGOs.

Upon passing of 100 minutes of the simulation, you and NAZIM will jointly call the Press Conference. In the press conference you will inform them about the disaster damages and losses and the government's response. With this Press Conference the SIMULATION will be completed.

Task of EDO Health

Introduction

You are an Executive District Officer (EDO) Health in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awoken to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25, 000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. The DCO has issued immediate orders for activation of the District Emergency Operations Center (DEOC). The DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). The District Nazim in his capacity as the Chairman DDMA is official head of the operations. However, effectively DCO is incharge of implementation of all response and relief activities.

DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, works, revenue, education, social welfare, civil defense, police and fire services. There also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent health sector. In this regard, you will undertake following actions.

- Participate in Response Coordination meetings regularly at the DEOC to be organized by the DCO on a regular basis and as required.
- Brief the DEOC about the casualties and injuries from the disaster
- Inform the DEOC about the damages and losses suffered to the health sector infrastructure
- Inform the DEOC about the number and location of people needing first aid, medicines and hospitalization amongst other health services.
- Deploy appropriately the required number of LHVs & LHWS at different medical treatment locations and make arrangements for additional staff.
- Make arrangements of essential health facilities at the IDP camps.
- Inform the DEOC about the resources that are available within the district health department for deployment; e.g. doctors, nurses, medicines, functional health facilities
- In cooperation with other departments and NGOs arrange for provision of health relief to the disaster survivors; e.g. first aid, triage, transportation to hospitals etc.
- Monitor progress on implementation of health response activities
- Make arrangements for receipt, recording, stockpiling and distribution of health services
- Take actions to restore the health infrastructure immediately so that health services could be provided to the disaster survivors

Time:

Simulation: 120 minutes

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for EDO Health

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

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Prior to the disaster, the health department had one District Hospital, two Tehsil hospitals, 20 Basic Health Unit (BHUs) and 45 Rural Health Units (RHUs). A total staff of 500 of the Health Department included 35 doctors, 150 nurses and the remaining Lady Health Workers.

The District Hospital was severely damaged and is not functional any more. One of the Tehsil Hospitals was partially damaged while other remained intact. The partially damaged hospital could be made functional with some amount of repair. You have learnt through your departmental sources that about 6 doctors have died in the collapse of the district and Tehsil hospitals. The families of another 10 doctors were affected, thus these doctors have also not reported for duty since the disaster.

The reports say that about 60 BHUs have been severely affected and are non-functional after the earthquake. Almost 80 RHUs were non-functional before the earthquake due to absence of staff and another 50 have been affected by the quake. District Headquarter is host to a huge number of casualties. The plight of the remote areas is not known in-terms of casualties.

You know that aside from the government doctors, about 08 doctors were running private practice in different parts of the district. However, you have no information about the whereabouts of these doctors in the aftermath of the disaster.

You understand from the health department workers and private callers that about 10,000 injured persons need immediate medical help. In addition the Civil Defense Department is working on rescue of the 25, 000 trapped people and there might be many who would need first aid and subsequent hospitalization.

In Balakot Tehsil, the earthquake has caused more damage and destruction whereas people coming from the bordering area of Gilgit Agency finding it extremely hard to reach the nearest emergency medical facility.

The administration of Civil Hospital Kaghan has set up a temporary medical / first aid camp but the major concern is that the injured are not being transported quickly due to long distance and destroyed communication system.

Tehsil Oghi has suffered relatively less but the adjoining tribal areas of Mata, Maira, Balkot, Shahlum and Kalasar are reported to have lot of injured persons who need to be immediately taken to hospitals in Barra Shehr and Dabnna in Oghi Tehsil.

The injured from Mansehra Tehsil can only be treated in the badly damaged Civil Hospital Mansehra City and another hospital in Baffa.

Action Points:

1. Contact DCO and seek his help/guidance for transfer of serious and specialized cases to appropriate facilities (spinal units, burn unit, pediatrics etc.) in other cities like Peshawar, Islamabad and Rawalpindi.
2. Contact and coordinate with Edhi Foundation, Rescue 115, Police and NGOs for the ambulance facility.
3. In consultation with other relevant public departments, identify locations for setting up of first-aid centers / emergency relief camps.
4. Seek help from the District Police Officer to secure ambulances' routes from first-aid points to frontline hospitals.
5. Think of some other short-term appropriate strategies for better medical assistance to injured and act accordingly.
- 6.

Task of EDO Public Works

Introduction

You are an Executive District Officer (EDO) WORKS in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awakened to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. The DCO has issued immediate orders for activation of the District Emergency Operations Center (DEOC). The DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). The District Nazim in his capacity as the Chairman DDMA is official head of the operations. However, effectively DCO is in charge of implementation of all response and relief activities.

DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, revenue, education, social welfare, civil defense, police and fire services. There also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent Works Department. In this regard, you will undertake following actions.

- Check state of water reservoirs and ensure required repairs and supply of water.
- Update and make ready the list of heavy machinery available in the district.
- Develop plan for military engineers.
- Participate in Response Coordination meetings regularly at the DEOC
- Brief the DEOC about the damages and losses suffered to the infrastructure of Works Dept.; e.g. roads, bridges, dams, etc
- Deploy resources to restore the infrastructure immediately so that relief could be provided to the disaster survivors and other response operations could be undertaken by various departments
- Inform the DEOC about the roads and bridges which have been restored and are functional
- Inform the DEOC about the status of repair of other roads/bridges, and infrastructure that is essential to facilitate response operations.

Time:

Simulation: 120 minutes

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for EDO Public Works

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

The district has a total population of 1,152,839 (1998 Census) or 143,970 households; female population is 580,958 or approximately 50.39 %, male population is 571,881 or 49.60 % of the total population. Population density is 252 persons/square kilometer. 45.5% of the population is aged below 15 years, while 50.6% are aged from 15-64. 3.9% are over 65 years old. 94.7 percent of the population lives in the rural areas. Mansehra is home to a diverse group of people, ranging from Afghan refugees, Turks, Pashtuns, Hazara, Kashmiris, Hindko, Tanolis, Rajputs, Swatis and Arians among many other ethnic groups.

Within the first few hours of the earthquake, you have continuously been contacted by different line departments for specific assistance but you lack required number of trained human resource including masons, drivers to operate heavy machinery, staff for conducting damage, loss and needs assessment of your concerned department and also you are facing labor shortage due to heavy loss to human lives and the increase in different labor work in the wake of disaster.

A bridge in Mansehra Tehsil near Jabba has been collapsed and causing great difficulties in bringing injured to the main city hospitals and relief camps. This situation has also been hampering the smooth transportation of relief goods to adjoining affected areas.

Another wooden bridge near Karwali Di Basti in balakot Tehsil has been collapsed making it extremely difficult for rescue workers to reach out to affected population in the upper areas bordering Gilgit Agency.

Similarly, roads leading to Balakot from Mansehra city are blocked due to rock falling and for the Health Department it has become hard to transport injured to Mansehra.

In Mansehra City, the Sewerage and water supply system has been severely damaged causing multiple problems for the affected population and relief & rescue workers.

Action Points:

1. Provide water and electricity to all emergency relief centers / camps and hospitals. For this, you may seek assistance from other district departments and private sector organizations.
2. Make plan with clear priorities of removing debris / rubble and ensuring roads access from different affected parts of all the three Tehsils to nearby dispensaries, hospitals and relief camps. You may request the Army and Civil Defence for assistance in this regard.
3. Ensure quick restoration of telecommunication services in district headquarters and Tehsil headquarters of Balakot and Oghi.
4. Provide first-hand information to Army about road blockade, bridges collapse and damages to other key infrastructure.
5. Coordination with ambulance services and relief centers management is vital.

Task of EDO Social Welfare

Introduction

You are an Executive District Officer Social Welfare (EDO) in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awoken to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. The DCO has issued immediate orders for activation of the District Emergency Operations Center (DEOC). The DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). The District Nazim in his capacity as the Chairman DDMA is official head of the operations. However, effectively DCO is in-charge of implementation of all response and relief activities.

DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, works, revenue, education, civil defense, police and fire services. There also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent Social Welfare Department. In this regard, you will undertake following actions.

- Participate in Response Coordination meetings regularly organized by the DCO at the DEOC
- Brief the DEOC about the Most Vulnerable Groups¹ affected from the disaster and the damage to Social Welfare Department's Infrastructure
- Inform DEOC about the needs and location of most vulnerable groups and their special conditions
- Propose strategies to the DEOC to address the special needs of most vulnerable groups
- Inform the DEOC about the resources that are available with the social welfare department
- In cooperation with other departments and NGOs arrange for provision of relief supplies to the most vulnerable disaster survivors
- Monitor irregularities in provision of assistance to most vulnerable groups and report that to the DEOC
- Prepare media briefs to inform most vulnerable groups about the special actions taken for them
- Take actions to restore the department's infrastructure immediately so that services could be provided to the disaster survivors

Time:

Simulation: 120 minutes

¹ Most Vulnerable Groups are defined as people in post disaster situations who may not get the chance to access relief supplies through normal channels of distribution or may have special needs which might be overlooked in the absence of special considerations and arrangements. Their security also might be at risk. They may include elderly, orphaned children, pregnant women, young single girls, disabled single individuals, or members of minority communities (ethnic, religious or caste based).

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for EDO Social Welfare

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

The district has a total population of 1,152,839 (1998 Census) or 143,970 households; female population is 580,958 or approximately 50.39 %, male population is 571,881 or 49.60 % of the total population. Population density is 252 persons/square kilometer. 45.5% of the population is aged below 15 years, while 50.6% are aged from 15-64. 3.9% are over 65 years old. 94.7 percent of the population lives in the rural areas. Mansehra is home to a diverse group of people, ranging from Afghan refugees, Turks, Pashtuns, Hazara, Kashmiris, Hindko, Tanolis, Rajputs, Swatis and Arians among many other ethnic groups.

There are media reports that lot of affected people have yet not been reached by the authorities concerned they are in a dire need of immediate assistance. The media reports have also mentioned the names of those villages which are located in Balakot tehsil.

Due to non-availability of computers and trained staff at your office you were not able to update the list of local NGOs working in different sectors. Now you have learnt through different sources that some local NGOs have already had reliable data on the most vulnerable groups in the district. This data can help the public and private sector a lot in developing short-term relief assistance strategies.

A number of national and international NGOs have started coming with food items, tents, blankets, and medicines etc. but they are complaining about the non-cooperation from the government side. They are believed to have very little information about the far off affected areas and the relief goods are restricted to only few known areas thus leaving lot of other affected villages and hamlets without any assistance.

In relief camps established at Tehsil headquarters of Oghi, Balakot and Mansehra, the volunteers and government-designated staff are facing problems in the fair distribution of relief items / food to affected families. There is a risk that politically influential and physically powerful individuals and groups would not let the food and other items reach poor and most vulnerable groups.

You are informed that in all the affected areas voluntary and charitable organizations including Red Crescent, Boy Scouts and National Volunteers Movement are working but without good coordination.

Action Points:

1. Devise a strategy to facilitate and manage the most vulnerable affected groups. You may contact Civil Defence, NGOs, office of the District Nazim and Health Department to immediately get information on the most vulnerable and marginalized affected population.
2. How would you ensure better coordination with other public and private sector departments and organizations involved in response activity for usefulness?
3. How would you assist the Health Department in trauma therapy --- may be by providing them volunteers / social workers?
4. Think of some subsistence for the most vulnerable groups --- may be in the form of stipend?
5. During the first 72 hours, you have to come-up with area-wise list of affected people who are believed to be very poor and are living in temporary shelters with elderly men and women, orphans and young girls.

Task of EDO Revenue

Introduction

You are an Executive District Officer (EDO) REVENUE in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awakened to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25, 000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. The DCO has issued immediate orders for activation of the District Emergency Operations Center (DEOC). The DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). The District Nazim in his capacity as the Chairman DDMA is official head of the operations. However, effectively DCO is in charge of implementation of all response and relief activities.

DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of Health, Works, Education, Social Welfare, Civil Defense, Police and Fire Services. There also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent REVENUE Department. In this regard, you will undertake following actions.

- Participate in Response Coordination meetings regularly at the DEOC
- Organize rapid assessment of the damages and losses suffered by people and government
- Brief the DEOC about most affected regions, sectors and social groups and provide an estimate of relief costs
- Ensure smooth implementation of compensation without any discrimination
- Conduct assessment of the damages and losses to the infrastructure of revenue department
- Inform the DEOC about the resources that are available with the District Revenue Department
- Provide support to other departments in stockpiling and distribution of relief supplies
- Make arrangements for receipt, recording, stockpiling of general relief supplies
- Take actions to restore the Revenue Department's infrastructure immediately

Time:

Simulation: 120 minutes

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for EDO Revenue

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

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The Provincial Disaster Management Authority (PDMA) has asked for the initial assessment of losses and estimates of relief costs. It is becoming a little difficult for your department to collect all the information within minimum possible time. On the other hand, a couple of international NGOs and UN agencies have already started the same exercise but their initial figures contradict with the official estimates of the district government.

Moreover, you have insufficient resources available in the district accounts for meeting such emergencies but at the same time you are facing problems in giving estimates to the DCO and the District Nazim for onwards submission to PDMA for required financial assistance.

The Social Welfare Department is trying to get hold of the information from different local, national and international NGOs about the available relief items / goods and immediate needs assessments for the next couple of weeks.

The initial damage & loss estimates suggest that Balakot Tehsil has suffered the most and you need to allocate more resources to that Tehsil for emergency response. But, you have also received a written request from Tehsil Nazim of Oghi through the District Nazim for same amount of resource allocation to Oghi. You are in a catch-22 situation but a quick decision has to be made in order to save lives in both the areas.

Based on the information coming from Social Welfare Department, NGOs and media, you are unable to figure out as to how much of the relief assistance has been provided to how many people and what more is required to meet emergency needs.

Action Points:

1. Remain in contact with all the district departments involved in the emergency response and keep track of all the resources being utilized.
2. Assess and develop list of priority areas which need to be reached immediately.
3. Calculate available resources and then prepare a demand & supply sheet for the next one week and submit it to the DCO for onward dispatch to PDMA.

Task of District Civil Defense Officer

Introduction

You are a District Civil Defense Officer in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awakened to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

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DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, works, revenue, education, social welfare, police and fire services. There are also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent Civil Defense Department. In this regard, you will undertake following actions:

- Participate in Response Coordination meetings regularly at the DEOC
- Inform the DEOC about the damages and losses suffered to the Civil Defense infrastructure
- Mobilize Civil Defense Volunteers to assist in search and rescue and general response
- Conduct a rapid assessment of people trapped, who need search and rescue
- Inform the DEOC about resources that are available with the Civil Defense department for deployment; e.g. volunteers, search and rescue experts, fire fighters etc
- In cooperation with other departments and NGOs arrange relief distribution to the disaster survivors; e.g. food, clothing, shelter etc etc.
- Monitor progress on implementation of rescue activities
- Keep track of the rescued individuals
- Take actions to restore the Civil Defense infrastructure immediately so that services could be provided to the disaster survivors

Time:

Simulation: 120 minutes

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for Civil Defense Officer

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

The district has a total population of 1,152,839 (1998 Census) or 143,970 households; female population is 580,958 or approximately 50.39 %, male population is 571,881 or 49.60 % of the total population. Population density is 252 persons/square kilometer. 45.5% of the population is aged below 15 years, while 50.6% are aged from 15-64. 3.9% are over 65 years old. 94.7 percent of the population lives in the rural areas. Mansehra is home to a diverse group of people, ranging from Afghan refugees, Turks, Pashtuns, Hazara, Kashmiris, Hindko, Tanolis, Rajputs, Swatis and Arians among many other ethnic groups.

A lot of kucha houses have been collapsed in and around Shinkiri of Tehsil Mansehra and people need immediate assistance. With limited resources you are asked to reach to them and undertake search and rescue on emergency basis.

In the meantime, the Army has reached the district and started the operation of evacuating people to the relief camps and other designated safe places.

You have also received reports that in villages Danna, Lundi Ser and Tambol in Mansehra Tehsil people are trapped under collapsed infrastructure and NGOs or other agencies have not reached there so far because the wooden bridge connecting these villages to rest of the district has been collapsed.

In Mansehra city, a group of young volunteers has been seen busy helping people in providing first aid and taking elderly to safe places. However, they lack experience and need guidance and leadership for them to be more effective and useful.

Action Points:

1. Immediately develop a plan of action for reaching out to maximum affected populace especially those on above mentioned villages and also in different parts of Mansehra city.
2. Contact Works department and any other relevant district agencies and NGOs for their assistance in helping people across the collapsed bridge.

Task of District Police Chief

Introduction

You are a District Police Chief in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awoken to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. The DCO has issued immediate orders for activation of the District Emergency Operations Center (DEOC). The DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). The District Nazim in his capacity as the Chairman DDMA is official head of the operations. However, effectively DCO is in charge of implementation of all response and relief activities.

DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, works, revenue, education, social welfare, civil defense and fire services. There are also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent Police Department. In this regard, you will undertake following actions.

- Participate in Response Coordination meetings regularly at the DEOC
- Inform DEOC about damages and losses to the Police department's infrastructure
- Ensure the maintenance of law and order to stop criminal elements from taking advantage of the situation
- Make arrangements to ensure security of the most vulnerable social groups; e.g. single children, widow-headed households, etc
- Inform the DEOC about resources that are available with the Police department for deployment; e.g. number of police staff, officers, vehicles, etc
- In cooperation with other departments and NGOs arrange relief to the disaster survivors.
- Take actions to restore the Police infrastructure immediately so that services could be provided to the disaster survivors

Time:

Simulation: 120 minutes

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for Police Chief

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

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Due to massive disaster, the traffic jam can be seen not only on Abbotabad-Mansehra road but also on the roads leading to Balakot and Oghi. This situation has been hampering the relief and Search & Rescue process.

You are finding it difficult to deploy police cops every where to ensure security of those who have rendered homeless especially the single children and young girls. Also, there are reports that some notorious people have snatched relief packets from the vehicle of an NGO which has generated a sense of insecurity among other relief organizations in the district.

Due to some un-organized and uncoordinated efforts at relief camps in all the tehsils and other spots where relief goods are being distributed, the influential groups are getting benefit where as the deserving, poor and elderly especially women are unable to have access to those items / services.

Some national and international NGOs have informed the District Government about the threats they have been receiving from local religious leaders who want them to leave the area on the pretext of keeping the religious values intact. Those NGOs have temporarily stopped the operation and waiting for security to be ensured by the concerned authorities.

Action Points:

1. Collect information from other district departments and NGOs about their work and any security-related issues in their respective areas.
2. Coordinate with military focal person(s).
3. Make temporary arrangements for police stations.
4. Ensure re-arrest of those who managed to escape following the partial collapse of the District Jail.
5. Make a plan of assisting the Traffic Police in smooth flow of public traffic within the district and also clear roads entering Mansehra district from AJ&K and Abbotabad.
6. Take information from Social Welfare Department about the existence of INGOs in the district and ensure their security during response phase.

Task of Chief of Fire Services

Introduction

You are a Chief of Fire Services in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awakened to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15,000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

A number of countries have announced the provision of assistance to your government for coping with the disaster. The area has been flooded with relief goods which have been sent by people from other parts of the country. The DCO has issued immediate orders for activation of the District Emergency Operations Center (DEOC). The DEOC is a multi-agency unit under the District Disaster Management Authority (DDMA). The District Nazim in his capacity as the Chairman DDMA is official head of the operations. However, effectively DCO is in charge of implementation of all response and relief activities.

DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, works, revenue, education, social welfare, civil defense and police. There are also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent Fire Department. In this regard, you will undertake following actions.

- Participate in Response Coordination meetings regularly at the DEOC
- Inform the DEOC about damages and losses suffered to the Fire Department
- Inform the DEOC about resources that are available with the Fire Department for deployment; e.g. number of fire fighters, location of fire department offices, number of fire tenders
- Suppress any fire incidents that may have occurred
- Conduct assessment of any other fire risks that might occur in the aftermath of earthquake
- Take actions to restore the Fire Departments' infrastructure immediately so that services could be provided if needed.

Time:

Simulation: 120 minutes

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for Chief of Fire Services

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

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In many areas of the main city (Mansehra) the electricity poles have fallen to ground along with high tension wires and there is a high risk of fire in case the concerned department restores the electricity without having a thorough checking of all the streets and roads.

Action Points:

1. Contact Public Works Department and Civil Defence Officer about areas where the fire has erupted or is likely to erupt.
2. Stay in constant contact with other district departments and non-governmental organizations for any help if they require at any point of time on emergency basis.

Task of EDO Education

Introduction

You are an EDO Education in Mansehra District. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awoken to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

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DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, works, revenue, social welfare, civil defense, police and fire services. There also representatives of information department.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent Education Department. In this regard, you will undertake following actions.

- Participate in Response Coordination meetings regularly at the DEOC
- Assess damage to the education sector infrastructure; e.g. schools, teachers etc
- Plan to rehabilitate the education services in the affected areas by restoring the damaged infrastructure and replacing the affected teachers
- Assist the DEOC/other departments in conducting damage and needs assessment by providing human resources
- Provide any other resources to the district government that might be required for effective disaster response.
- Allow the disaster survivors to take refuge inside the school/college buildings if needed
- Make provisions for supply of water and sanitation services to the disaster survivors staying in schools

Time:

Simulation: 120 minutes

Note:

You might receive information from the field, from other departments or from the DCO, based upon which you may have to revise your decisions or take new decisions.

Information for EDO Education

District Mansehra is located at the eastern border of the NWFP and is bounded on the north by Kohistan and Battagram Districts, on the east by Muzaffarabad District of Azad Jammu and Kashmir, on the south by Abbotabad and Haripur Districts and on the west by Shangla and Buner Districts. Its total area is 4,579 square kilometers and is divided into three Tehsil divisions of Mansehra, Balakot and Oghi.

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In the district there were about 300,000 students in 1000 schools, 20 colleges under the education department. From the reports of your field education officers, you understand that about 150 schools have been severely damaged by the earthquake and about 2000 children unfortunately died in the quake. You feel so bad that the building of these schools were not made to standards of earthquake resilience. About 87 teachers have lost their lives, while about 200 have been seriously injured. Families of another 350 teachers have been affected from the disaster.

You have decided to close the schools for about two weeks due to the losses and the mourning period. There are huge numbers of people who have become homeless and need refuge. Upon request of the DCO/NAZIM you have to assist them by providing schools for refuge. However, a number of schools were partially damaged and need some repair before in order to be made available for the affected people.

You want the Works department to arrange for the repair of the partially damaged schools. You also want to know how many people exactly need refuge in which parts of the district. Many schools also have lost electricity supply and telecommunication links.

You know that there were more than 50 private schools in various parts of the district. You are not aware of the plight of those schools and the students and teachers there.

Action Points:

1. Ask from other departments about emergency relief centers to be set up in different parts of the district.
2. Make arrangements for temporary schooling and provide books.
3. Provide food/water etc. to kids at schools.
4. Prepare list of those schools which can still be selected as emergency operation centers despite the great damage to the physical infrastructure of the Education Department.
5. Contact Public Works Department for the provision of basic facilities at identify

Task of District Information Officer

Introduction

You are a District Information Officer in Mansehra. It is a weekend and you have plans to see your relatives and spend time with your family members. Late at night you were awakened to heavy shaking of the house and sounds of severe noise. You realize that it was a tremor. Later on you learnt that whole Mansehra district and adjoining districts have been affected by a severe earthquake. It is estimated that about 3000 people are confirmed dead and another 25,000 are missing in the district. They are believed to be trapped under the rubble. As per estimates, about 15000 households have been fully destroyed while about 22,000 are partly damaged in the district. It seems that about 80,000 families have been affected by the disaster. There are thousands of people who need immediate assistance; e.g. search, rescue, food, shelter, clothing, first aid, medicines etc. Single children, women and elderly need physical security from the criminals. It is essential that effective disaster response is organized immediately in order to rescue those under the rubble and to assist the survivors.

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DCO has asked you to become part of the DEOC and help in management of relief and response operations along with EDOs of health, works, revenue, education, social welfare, civil defense, police and fire services.

Task:

You will participate in the disaster response and relief operations through the DEOC to represent Information Department. In this regard, you will undertake following actions.

- Participate in Response Coordination meetings regularly at the DEOC
- Analyze information about casualties, injuries and damage and losses by consulting various departments
- Analyze information about donations and assistance received
- Prepare briefs on losses/damages as well as about disaster response by the District Government
- Brief the NAZIM, DCO and other members of the DEOC about situation of losses/damages and status of response operations.
- Prepare media briefs and send them to print and electronic media
- Organize Press Briefings with the NAZIM and the DCO

Time:

Simulation: 120 minutes

Note:

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Information for District Information Officer

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You are associated with the DCO office in order to acquire and maintain track of all relevant information; e.g. damage and losses information, information about assistance/aid and information about the government's disaster response.

You keep track of information from the DEOC meeting. As well you interact closely with different departments frequently on a bilateral basis and seek updates from them. You analyse information received and prepare briefs for the DCO, the NAZIM and for Media. You circulate the latest information to the NAZIM, DCO and the Media. If needed you also circulate information to other departments.

An important task you have is to interact with media and provide them updates on government's efforts in terms of relief and response.

At passing of 100 minutes to the SIMULATION, you organize a Press Conference for the NAZIM and the DCO to brief the media about the post disaster situation and the action taken by the District Government.

Action Points:

1. Prepare the first press release about the disaster with necessary information for public consumption and issue it through different media outlets – both print and electronic national and international media.
2. For this purpose, contact all the district departments and private sector organizations and get information about the work they have done so far or currently doing in different parts of the affected areas.
3. Hold daily press briefings and issue press releases for wider dissemination until the emergency phase is over.



5th Dialogue for MWFP and UNDA Government officials & NGOs on
"Disaster Risk Management"
October 5 – 10, 2009 Islamabad



THANKS



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