Participant's Workbook for Government Officials

Community Based Disaster Risk Management

Provincial Disaster Management Authority, Sindh

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Message by Director General

The purpose of this workbook is to enhance the capacity of government officials on Community Based Disaster Risk Management (CBDRM). By consulting this workbook, the government officials at provincial and district levels across Sindh Province will be benefited in terms of understanding the CBDRM concepts, its importance and significance, gain first-hand knowledge and perspective of resilient communities. It is a step forward towards the capacity enhancement of government officials towards effective disaster management system in the Province.

It is expected that the Workbook will be adapted and used by the government officials in the true spirit for effectively protecting the vulnerable communities from the adverse impacts of disasters.

Syed Salman Shah
Director General
Provincial Disaster Management Authority, Sindh

Introduction to the CBDRM Workbook for Government Officials

The mandate of the Provincial Disaster Management Authority, Sindh is to enhance provincial preparedness and response capacities by improving resilience to natural and human-induced hazards. This workbook has been developed with the financial assistance by the World Bank under Sindh Resilience Project (PDMA Component). It will help government officials to understand the Community Based Disaster Risk Management (CBDRM) process and their role in harmonizing the CBDRM into overall disaster management system in province.

Purpose

Realizing the significance of capacity building of Government Officials, the purpose of this workbook is to facilitate the capacity building of government officials on Community Based Disaster Risk Management (CBDRM). Consequently, Government officials and local communities in hazard prone areas of the Province would augment their technical capacities to minimize risks related to disasters and to help create a safer Sindh.

Target Users

The Workbook is intended to be used by the government officials and other relevant stakeholders and those who will facilitate the implementation of CBDRM at communities. It serves as a guide in understanding and implementing disaster risk management strategies at all levels.

This workbook contains following modules:

Module	Units	
Module No 1 Introduction to CBDRM and its Process	**Unit 1.1:**	Disaster Risk Management: Basic Concepts & Terminologies
	Unit 1.2:	Hazard & Risk Profile of Sindh Province
	Unit 1.3:	CBDRM concept, importance, need and process
Module No 2 Disaster Management System in Pakistan and Sindh Province	**Unit 2.1:**	Evolution of Disaster Risk Management -DRM in Pakistan
	Unit 2.2:	Disaster Management System in Pakistan, with focus on Sindh Province
	Unit 2.3:	Role & Importance of CBOs in Local level CBDRM
Module No 3 Disasters and their impacts on individuals and communities	**Unit 3.1:**	Physical, social, psychological and economic impacts of natural hazards
	Unit 3.2:	Vulnerable segments within communities i.e. women, children, elderly, people with disabilities and marginalized groups
	Unit 3.3:	Health impacts of natural hazards and concept of Triage systems in mass casualty incident management
	Unit 3.4:	Introduction to Sphere Standards
Module No 4 Community Preparedness and Emergency Response Management at Community Level	**Unit 4.1:**	An overview to Emergency Response Management at various levels
	Unit 4.2:	Importance of Emergency Response and community preparedness
	Unit 4.3:	Establishing DRR Committees and ER Teams (Assigning Roles and Responsibilities)
	Unit 4.4:	Hazard specific Community Based Early Warning Systems & Mechanism
Module No 5 Participatory Risk Assessment (PRA) and Disaster Risk Reduction (DRR) planning at Community level	**Unit 5.1:**	Multi-Hazard Vulnerability and Capacity Assessment-HVCA
	Unit 5.2:	Risk identification and assessment- Participatory Rural Appraisal -PRA Tools used for risk assessment at community level
	Unit 5.3:	Disaster Risk Reduction-DRR Planning at Community Level (Need and Importance)
Module No 6 Hazard Specific Community Based Disaster Risk Mitigation Measures	**Unit 6.1:**	An Overview of risk mitigation measures including structural and non-structural measures
	Unit 6.2:	Hazard specific mitigation measures (Flood, Cyclone, Tsunami and Sea Intrusion etc.)

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MODULE-6: HAZARD SPECIFIC COMMUNITY BASED DISASTER RISK MITIGATION MEASURES

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Abbreviations

ADPC	**Asian Disaster Preparedness Center**
CBDRM	Community Based Disaster Risk Management
CBDRR	Community Based Disaster Risk Reduction
CBO	Community Based Organization
CCB	Citizen Community Boards
CDKN	Climate and Development Knowledge Network
Cos	Community Organizations
CSO	Civil Society Organizations
DDMA	District Disaster Management Authority
DEOC	District Emergency Operation Center
DM	Disaster Management
DMC	Disaster Management Committee
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EQ	Earthquake
ERC	Emergency Relief Cell
EWS	Early Warning System
GIS	Geographical Information System
HFA	Hyogo Framework for Action
HIV	Human Immunodeficiency Virus
HVCA	Hazard, Vulnerability and Capacity Assessment
IASC	Inter-Agency Standing Committee
ICS	Incident Command System
IDNDR	International Decade for Natural Disaster Reduction
I/NGOs	International/Non-Government Organizations
LG	Local Government
LHW	Lady Health Worker
LSO	Local Support Organization
MHVRA	Multi Hazard, Vulnerability and Risk Assessment
MOU	Memorandum of Understanding
NDMA	National Disaster Management Authority
NDMC	National Disaster Management Commission
NDMO	National Disaster Management Ordinance
NDMP	National Disaster Management Plan
NDRMF	National Disaster Risk Management Framework
NIDM	National Institute of Disaster Management
PDRA	Participatory Disaster Risk Assessment
PDMA	Provincial Disaster Management Authority
PDMC	Provincial Disaster Management Commission
PEOS	Provincial Emergency Operation Center
PIU	Project Implementation Unit
PMD	Pakistan Meteorological Department
PRA	Participatory Rural Appraisal & Participatory Risk Assessment
PRCS	Pakistan Red Crescent Society
SDGs	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction
SMBR	Senior Member Board of Revenue
SOPs	Standard Operating Procedures
TDMC	Tehsil Disaster Management Committee
TOT	Training of Trainers
UC	Union Council
UCDMC	Union Council Disaster Management Committee
UCDMP	Union Council Disaster Management Plan
UN	United Nation
UNISDR	United Nation International Strategy for Disaster Reduction
VCA	Vulnerability and Capacity Assessment
VDMC	Village Disaster Management Committee
VDMP	Village Disaster Management Plan
VDO	Village Development Organization
WCDRR	World Conference on Disaster Risk Reduction
WHO	World Health Organization

Module-1

Introduction to CBDRM and its Process

Unit 1.1:	Disaster Risk Management: Basic Concepts & Terminologies
Unit 1.2:	Hazard & Risk Profile of Sindh Province
Unit 1.3:	CBDRM concept, importance, need and process

Outcomes

Upon completion of this Module you will be able to:

- Understand basic concepts & terminologies used in DRM and describe disaster management, hazard, emergency, disaster, vulnerability and risk.
- Identify and know the hazard & risk profile of Sindh Province and list and describe the main hazards to which province is, or may be vulnerable along with the various vulnerability conditions present in the province.
- Understand the concept of CBDRM and know its importance and need in reducing the vulnerabilities of communities in Sindh province

Unit 1.1

Name:	**Disaster Risk Management: Basic Concepts & Terminologies**
Learning Objective:	Understand basic concepts & terminologies used in DRM and able to describe disaster risk management, disaster risk reduction, hazard, emergency, disaster, vulnerability and risk.
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Plenary, interactive discussion, learning from local experiences, group work, group presentation, audio visual aids, and Q/A

1. Definitions

1.1. Capacity

The combination of all the strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience.

Capacity may include infrastructure, institutions, human knowledge and skills, and collective attributes such as social relationships, leadership and management.

1.2. Coping capacity

Coping capacity is the ability of people, organizations and systems, using available skills and resources, to manage adverse conditions, risk or disasters.

The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during disasters or adverse conditions. Coping capacities contribute to the reduction of disaster risks.

1.3. Capacity assessment

Capacity assessment is the process by which the capacity of a group, organization or society is reviewed against desired goals, where existing capacities are identified for maintenance or strengthening and capacity gaps are identified for further action.

1.4. Capacity development

Capacity development is the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals. It is a concept that extends the term of capacity -building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems and the wider enabling environment.

1.5. Disaster

A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts. The effect of the disaster can be immediate and localized, but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighboring jurisdictions, or those at the national or international levels.

1.6. Emergency

Emergency is sometimes used interchangeably with the term disaster, as, for example, in the context of biological and technological hazards or health emergencies, which, however, can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society.

1.7. Disaster damage

Disaster damage occurs during and immediately after the disaster. This is usually measured in physical units (e.g., square meters of housing, kilometers of roads, etc.), and describes the total or partial destruction of physical assets, the disruption of basic services and damages to sources of livelihood in the affected area.

1.8. Disaster impact

Disaster impact is the total effect, including negative effects (e.g., economic losses) and positive effects (e.g., economic gains), of a hazardous event or a disaster. The term includes economic, human and environmental impacts, and may include death, injuries, disease and other negative effects on human physical, mental and social well-being.

1.9. Disaster management

The organization, planning and application of measures preparing for, responding to and recovering from disasters

Disaster management may not completely avert or eliminate the threats; it focuses on creating and implementing preparedness and other plans to decrease the impact of disasters and “build back better”. Failure to create and apply a plan could lead to damage to life, assets and lost revenue.

1.10. Emergency management

Emergency management is also used, sometimes interchangeably, with the term disaster management, particularly in the context of biological and technological hazards and for health emergencies. While there is a large degree of overlap, an emergency can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society.

1.11. Disaster risk

The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.

The definition of disaster risk reflects the concept of hazardous events and disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types

of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socioeconomic development, disaster risks can be assessed and mapped, in broad terms at least. It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors.

1.12. Risk assessment

A qualitative or quantitative approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend.

1.13. Disaster risk assessment

Disaster risk assessments include: the identification of hazards; a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability, including the physical, social, health, environmental and economic dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities with respect to likely risk scenarios.

1.14. Disaster risk management

Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses. Disaster risk management actions can be distinguished between prospective disaster risk management, corrective disaster risk management and compensatory disaster risk management, also called residual risk management.

1.15. Community-based disaster risk management

Community-based disaster risk management promotes the involvement of potentially affected communities in disaster risk management at the local level. This includes community assessments of hazards, vulnerabilities and capacities, and their involvement in planning, implementation, monitoring and evaluation of local action for disaster risk reduction.

1.16. Disaster risk reduction

Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development. Disaster risk reduction is the policy objective of disaster risk management, and its goals and objectives are defined in disaster risk reduction strategies and plans.

1.17. Early warning system

An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events

1.18. Exposure

The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas

1.19. Hazard

A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation

1.20. Biological hazards

Biological hazards are of organic origin or conveyed by biological vectors, including pathogenic microorganisms, toxins and bioactive substances. Examples are bacteria, viruses or parasites, as well as venomous wildlife and insects, poisonous plants and mosquitoes carrying disease-causing agents.

1.21. Environmental hazards

Environmental hazards may include chemical, natural and biological hazards. They can be created by environmental degradation or physical or chemical pollution in the air, water and soil. However, many of the processes and phenomena that fall into this category may be termed drivers of hazard and risk rather than hazards in themselves, such as soil degradation, deforestation, loss of biodiversity, salinization and sea-level rise.

1.22. Geological or geophysical hazards

Geological or geophysical hazards originate from internal earth processes. Examples are earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses and debris or mud flows.

1.23. Hydro-meteorological Hazards

Hydro-meteorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize: although they are triggered by undersea earthquakes and other geological events, they essentially become an oceanic process that is manifested as a coastal water-related hazard. Hydro-meteorological hazards are of atmospheric, hydrological or oceanographic origin. Examples are tropical cyclones (also known as typhoons and hurricanes); floods, including flash floods; drought; heatwaves and cold spells;

and coastal storm surges. Hydro-meteorological conditions may also be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics and in the transport and dispersal of toxic substances and volcanic eruption material.

1.24. Technological hazards

Technological hazards originate from technological or industrial conditions, dangerous procedures, infrastructure failures or specific human activities. Examples include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires and chemical spills.

Technological hazards also may arise directly as a result of the impacts of a natural hazard event.

1.25. Hazardous event

The manifestation of a hazard in a particular place during a particular period of time

1.26. Mitigation

The lessening or minimizing of the adverse impacts of a hazardous event

The adverse impacts of hazards, in particular natural hazards, often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures include engineering techniques and hazard-resistant construction as well as improved environmental and social policies and public awareness. It should be noted that, in climate change policy, “mitigation” is defined differently, and is the term used for the reduction of greenhouse gas emissions that are the source of climate change.

1.27. Preparedness

The knowledge and capacities developed by governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters.

Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery.

1.28. Prevention

Activities and measures to avoid existing and new disaster risks

Prevention (i.e., disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts of hazardous events. While certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure in such contexts where,

as a result, the risk of disaster is removed. Examples include dams or embankments that eliminate flood risks, land - use regulations that do not permit any settlement in high-risk zones, seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake and immunization against vaccine-preventable diseases. Prevention measures can also be taken during or after a hazardous event or disaster to prevent secondary hazards or their consequences, such as measures to prevent the contamination of water.

1.29. Reconstruction

The medium- and long-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.

1.30. Recovery

The restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster affected community or society, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.

1.31. Rehabilitation

The restoration of basic services and facilities for the functioning of a community or a society affected by a disaster

1.32. Resilience

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.

1.33. Response

Actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

1.34. Structural and non-structural measures

Structural measures are any physical construction to reduce or avoid possible impacts of hazards, or the application of engineering techniques or technology to achieve hazard resistance and resilience in structures or systems. Non-structural measures are measures not involving physical construction which use knowledge, practice or agreement to reduce

disaster risks and impacts, in particular through policies and laws, public awareness raising, training and education

1.35. Vulnerability

The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Further Reading and Reference

United Nations, General Assembly, Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction - 1 December 2016.

Unit 1.2

Name:	**Hazard & Risk Profile of Sindh Province**
Learning Objective:	To identify and know the hazard & risk profile of Sindh Province and list and describe the main hazards to which province is, or may be vulnerable.
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Plenary, interactive discussion, learning from local experiences, group work, group presentation, audio visual aids, and Q/A

1. Introduction

Located in southeast of Pakistan by area Sindh province is third largest province of Pakistan and second largest by means of population after Punjab. According to 2017 Census of Pakistan Sindh has a population of 47.9 million, with a growth rate of 2.41%. In comparison with other provinces, Sindh has highest urban population i.e. 52.02%. Administratively Sindh Province is divided in 6 Divisions comprising of 29 Districts. Pakistan's largest city and financial hub, Karachi is the provincial capital of Sindh Province[1].

The landscape of province is diverse, however it mostly consists of sandy plains which are located astride River Indus. River Indus enters the province near Guddu Barrage and flows throughout the length of province, mostly remaining on the western side before draining itself into Arabian Sea. Indus River is the longest river in Pakistan, and the world's 21st largest in terms of annual water flow. It is a life line for Pakistan as well as for the Sindh province. River Indus forms a delta known as Indus River Delta where it merges into the Arabian Sea. This delta is houses to largest mangrove forest in Pakistan. The delta covers an area of about 41,440 km^2, and is approximately 210 km across where river meets the sea. In addition to River Indus alluvial plains and delta, the diverse landscape of province offers Thar Desert in the east, where it forms a natural boundary between India and Pakistan and the Kirthar Mountain Ranges located in south west of province in the lower reaches of Indus plains between Sindh and Balochistan. The maximum elevation in the Sindh segment of the Kirthar Mountains is 7,056 ft (2,151 m) above sea-level.

2. Hazards in Sindh

The province of Sindh has remained vulnerable to the impacts of a number of natural hazards. Main natural hazards which adversely affect people, infrastructure, crops and environments in province include droughts, riverine floods, earthquakes, heatwaves and coastal hazards. In addition, a number of human induced hazard occurrences like industrial and urban fires, pollution and environmental degradation have become common sight especially in urban areas. The vulnerabilities of communities to these adverse events are further exacerbated by their limited risk reduction knowledge, inadequate coping capacities, overpopulation, and unplanned development and as a result of poor socio-economic conditions, especially in least developed areas of province. Historical data shows that province has regularly suffered from both natural and human induced disasters. The high level of risk province faces is mainly from hydro-metrological hazards i.e. floods/heavy rains, flash floods, cyclones in coastal areas, sea intrusion and droughts; in addition, due to physical location province it is also prone to geological hazards i.e. earthquake and tsunami.

2.1. Floods / Rains

The floods in River Indus are generally caused by heavy rainfall in the catchment areas during the monsoon season (July to September), which are also augmented by snowmelt flow. In Pakistan almost two-thirds of the rainfall is concentrated in the three months i.e. July – September, which approximately 60 to 70% of the annual rainfall. All the major

[1] http://www.pbs.gov.pk/content/population-census

tributaries of Indus River which include Kabul River and Kurram River on the right bank, and the Jhelum River, Chenab River, Ravi River, Beas River and the Sutlej on the left merge as one mighty Indus River at Panjnad south of District Bahawalpur, before entering Sindh Province. The floods in Sindh Province usually occur in late summer when surplus monsoon rain waters from all its tributaries combine to augment its flow. The flat and gradually sloping topography of plains in Sindh, especially at the lower reaches of Indus basin makes it difficult for surplus water of Indus River to drain easily through the province. In addition, occasionally the hill torrents emanating from Kirthar Ranges also add up to the pressure, till River Indus drains into the Arabian Sea.

Floods in River Indus are a regular phenomenon, especially during monsoons, with monetary losses running into millions. These floods are unpredictable and dangerous to humans, infrastructure, crops and livestock as the Indus River is popular for changing its course. The banks of the river are very unstable, especially during floods they can collapse leading to the destruction of whole human settlements along its banks. Economic losses resulting from annual flooding are a major burden on the provincial economy. Regular riverine floods threaten vital resources of province i.e. population, agricultural and communication infrastructure. Historically, highest recorded floods occurred during 1942, 1956, 1957, 1958, 1973, 1975, 1976, 1979, 1992, 1994, 1995, 2003, 2005, 2007, 2010, 2011 and 2012.

In Sindh River Indus is contained by flood protection embankments, which are 1400 miles long, so as, to protect irrigation network emanating from three barrages having 12.8 million acres of command area. Besides, there is a huge surface drainage network of channels and 6,000 public tube wells, roads and railways network, cities / towns, rural settlements etc.

2.2. Cyclone

The cyclone refers high speed winds travelling to any low pressure area with winds spiraling inwards. Cyclones rotate clockwise in the Southern Hemisphere and anti-clockwise in the Northern Hemisphere. They are also referred to as hurricanes and typhoons. The coastal districts of province especially, Thatta and Badin are prone to cyclones and in past have been adversely affected by heavy rainfall and winds. The three coastal districts i.e. Karachi, Thatta and Badin, are highly vulnerable to cyclone hazard. Cyclones not only impact houses, crops and infrastructure, but they also destroy and damaged fishing boats, therefore badly affected the livelihood of the majority of residents of these two districts.

The tropical cyclones which affected Sindh Province during the last 100 years happened in May 1902, June 1926, June 1964, November 1993, June 1998, May 1999 and June 2007. The Cyclone Yemen in 1999 hit three coastal districts of Sindh; it affected 1,449 villages and killed about 244 people. Moreover, the recent cyclones of PHET, 2010 caused significant damages in district Thatta.

2.3. Tsunami

A tsunami or tidal wave phenomenon happens due to successive series of waves in a water body i.e. lake, sea or ocean, caused by displacement of a large volume of water. Events which have capability to displace large volume of water to initiate tsunami hazard include

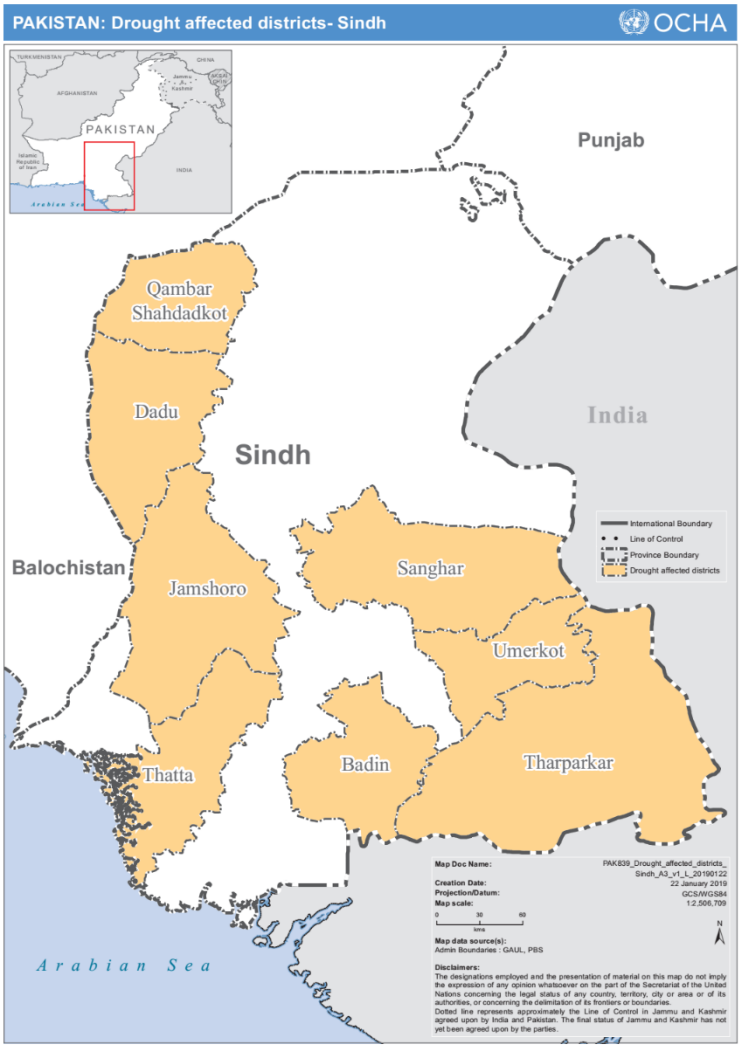
earthquakes, volcanic eruptions and huge explosions above or below water. Sindh has history of Tsunami, in November 1945 Tsunami affected Makran coast of Balochistan Province it produced sea waves of as high as 12-15 meters which killed about 4,000 people. Although, Karachi remained relatively unaffected but still it experiences sea waves as high as six feet. Karachi also experienced the effects of tsunami in December, 2004 in shape of rise in water levels in the coastal areas of Sindh.

2.4. Drought

Technically Drought is defined as a prolonged period of scarce precipitation that results in extensive damage to crops, human beings and environment. There are four major types of drought as reported by experts i.e. meteorological, agricultural, hydrological and socio-economic. In Sindh drought in all these four forms exist, with different intensities in different districts, below figure shows the interaction of various factors causing the different types of drought. The drought differs from other natural disaster e.g. flood, tropical cyclones, tornadoes and earthquakes etc. in the sense that the effects of drought often accumulate slowly over a considerable period of time and may linger for years even after the termination of the event. Therefore, the drought is often referred to as a "Creeping Phenomena". Drought impacts are gradual, less obvious and can be spread over large areas. Nonetheless, world over drought affects more people than any other environmental hazard. All the provinces of Pakistan have a history of facing major droughts in the past. Sindh had its worst droughts in 1871, 1881,1899,1931,1947 and 1999. Thar Desert and Kirthar Ranges of Sindh Province are particularly drought prone.

The worst drought in Sindh persisted from 1998 till 2002. The affected around 1.4 million people, 5.6 million cattle head and 12.5 million acres cropped area were affected. The statistics of Sindh government indicate that in 1998 the cultivated area reduced from 3.415 million acres to 2.611 million acres. The worst affected crop areas were wheat and rice producing areas, the reduction in yields were 22% and 35% respectively, resulting in extreme food scarcity all over Sindh. In 2013 Sindh again, water scarcity and below average rainfalls created drought-like conditions. This turned into full fledge drought from 2014 onwards, districts of Tharparkar, Umerkot and Sanghar were worst hit by this drought.

Figure 1: Drought Hazard Risk Ranking of Sindh Province



Source: Web relief map (https://reliefweb.int/map/pakistan/pakistan-drought-affected-districts-sindh-22-january-2019)

2.5. Earthquake

The geophysical location of Sindh makes it particularly prone to earthquakes. Sindh province, situated near the active fault zone situated in Gujrat India and further near to Makran Subduction Zone in Pakistan part of Arabian Sea, Karachi and other coastal areas are considered at high risk of an earthquake. According to geologists, a geological tectonic line runs under Karachi through Khirthar Ranges to northwest towards Thar Desert due to which Sindh also has relatively high risk of any major earthquake in the future. The Iran earthquake of April 2013 also affected Karachi. It was recorded in Karachi at Richter scale 5.5. The last known major earthquake that affected Sindh occurred in 2001, it severely affected Tharparkar and Badin Districts, killing 12 people and severely injuring almost 115. According to the official records about 1,989 houses were fully damaged while 43,643 houses were partially destroyed. The total financial loss was recorded at Rs. 2.4 billion.

2.6. Sea Water Intrusion

Beside riverine floods, drought and cyclone and tsunami the entire coastal belt of Sindh is under threat from sea water intrusion in land. The districts of Thatta, Badin and parts of Karachi are amongst the worst impacted. Sindh's topography in the lower reaches of Indus River is devoid of gradient and at places it is relatively flat. Thus, the rate of out flow of water downstream Kotri Barrage declines drastically, resulting in massive sea water intrusion inland in coastal area of both districts. This intrusion adversely affects not only people but also the crops, flora and fauna particularly fresh water fish species which are the mainstay of people of these areas. The sea intrusion is also causing destruction of mangrove forests and fish species in Indus delta. This problem has rendered millions of acres of fertile farm lands non-productive and adversely affected coastal mangrove forests. According to official estimates approx. 1.2 million acres area is already affected by sea water intrusion in 9 Talukas of Badin and Thatta.

A latest research indicates that Indus River use to throw 400 million tons of silt in the sea every year, which has now been reduced to just about 100 million tons a year. This gradual depletion in out flow of freshwater and rich silt into the sea has not only slowed down delta formation, but has accelerated sea intrusion and led to hyper-saline condition in the coastal areas that is degrading the natural resources like, land, livestock, vegetation, fish, mangroves, and other edible marine varieties in the sea. Moreover, the shortage of fresh water together with seawater intrusion is consistently changing the geo-morphology of the region as well as forcing the coastal communities to shift their livelihoods. Therefore, if risk is not properly managed in time it may transform into disaster, resulting in total destruction of environments and the coastal communities.

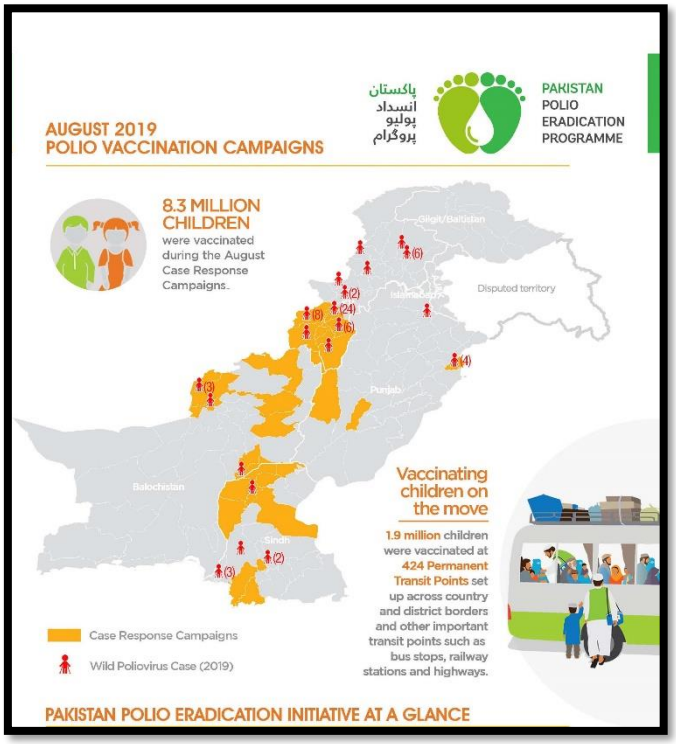
2.7. Epidemics & Pandemics

Human health in Province is dependent on multi-dimensional factors, ranging from increased frequency of hazards due to global climate change to food shortages and malnutrition; these factors individually and collectively adversely impact the health and wellbeing of communities in Sindh.

- For instance, extreme food shortages at household level due to destruction of crops by riverine floods or by low rainfalls results in malnutrition. Malnutrition in children and elderly is main cause of diseases like anaemia, scurvy and night blindness.
- Pakistan is one of only three countries in the world with ongoing wild poliovirus transmission, alongside Afghanistan and Nigeria. According to the World Health Organisation-WHO during 2019, 6 cases of polio were reported from Sindh Province.
- The vulnerability of Sindh to climate change primarily stems from its relatively warmer climate. Moreover, the unique geographical location and topographical features also makes province vulnerable to the effects of climate change. The rising temperatures and humidity levels lead to conditions which result in increase in heat related morbidity and mortality. The rising temperatures also escalate transmission of vector-borne diseases such as dengue fever, encephalitis, malaria and yellow fever.
- Moreover, in early 2019 an outbreak of Human Immunodeficiency Virus (HIV)was declared in District Larkana. According to WHO, since the beginning of outbreak about 751 people have been tested positive for HIV.
- Snake bite cases in Sindh are mainly reported from rural areas, according to a study most snake bites occur on the lower limbs of farmers, hands-men and hunters in the rural areas[2], where basic health facilities are poor and as a result deaths are common. District Tharparkar has most high rate of snakebite problem in Sindh. Unfortunately, there are no reliable statistics to accurately indicate the exact morbidity and mortality numbers of snake bite in developing countries. The data and statistics available are all based only on reported hospital cases. According to a survey, the estimated annual mortality rate due to snake bite in Pakistan is 1.9/100,000 population. Moreover, snakebite cases are relatively higher in summer and rainy season. Seasonal variation in the incidence of snake bite is attributed to farming activity in relation to rainfall and to the yearly reproductive cycle of the snake; severe flooding has given rise to epidemics of snake bite in Pakistan, Colombia and India. Another serious public health issue is stray/ feral dog bite; more than 92,000 cases of dog bite have been reported across Sindh during the current year. This problem is further worsened by serious shortages of anti- rabies vaccine in the province according to Provincial Health Minister Azra Pechuho. Both these public health issues can be resolved with timely and appropriate pre-hospital and specialized medical treatment of victims.

[2] Hati-AK. Epidemiology of Snake bite in West Bengal. Indian-Med-Assoc- 1992

Figure 2: Pakistan Polio Eradication Initiative 2019



Source: Pakistan Polio Eradication Programme

(http://polioeradication.org/wp-content/uploads/2019/10/Pakistan-Polio-Update-August-2019.pdf)

2.8. Environmental Degradation

Lack of proper basic civic facilities i.e. waste disposal and sewerage in major metropolis across province mostly result is disposal of solid and liquid garbage/waste into River Indus. The urban waste along with untreated human waste and industrial toxic pollutants, all end up in the Indus River and ultimately in Arabian Sea. This practice has grave and negative repercussions for environment, animals, marine life and humans, as well as on agricultural production. Common consequences of this pollution in shape of toxic / acidic water, soil degradation, reduced number of cattle herds, reduction in crop yields and heavy reduction in milk production are threatening the socio-economic sustainability of millions of people who are dependent on agriculture, fishing and livestock farming. Due to loss of livelihood sources, over the years, especially in last three decades poverty has increased significantly in the coastal belt of Thatta and Badin districts. These both districts have attained classification of extremely poor in BISP poverty survey.

2.9. Urban/ Domestic Fires

Considering the pace of unplanned rapid urbanization and industrialization in Sindh, in absence of any agency for enforcement of safety and health legislation the chances of catastrophic urban fires cannot be ignored. In addition, CNG gas stations are installed in all

urban areas and Liquid Petroleum Gas-LPG is also sold at small shops and stores, disregarding all safety precautions. These dangerous practices combined with massive culture of smoking further enhance risk of fire. According to an estimate, on average in Karachi, 3 – 4 fire incidents take place every day. Availability of fire brigade / firefighting equipment even in major urban centres like Karachi is not adequate by any standards.

3. Vulnerabilities in Sindh

Various forms of vulnerabilities exist in Sindh province i.e. physical, social, attitudinal and economic. For details refer to Table No-1, below:

Table 1: Vulnerabilities and Vulnerability Enhancing Factors

Vulnerabilities	Vulnerabilities enhancing Factors
Physical	Hazard prone locations of settlements, 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. etc.…
Social	Lack of institutional support structures and leadership, Weak family and kinship relations, Divisions and conflicts within communities Absence of decision- making power Social inequalities etc.…
Attitudinal	Dependency, Resistance towards change/ other negative beliefs. Low self-esteem and confidence in their ability to affect change Thoughts and feeling of being defeated and overwhelmed / feeling of helplessness Lack of desire and ability to bring positive change individually and as community
Economic	Livelihood sources easily affected by disasters Fewer choices and limited resources Economic classes and segregation of society etc.….

3.1. Unplanned Urban Growth

Urban population of Pakistan is expected to rise to 50% by the year 2030. The Sindh Province is not far behind, in 2014 over one person in three (39%) lived in urban areas[3]. In the urban zones, factors like high population growth caused by rural to urban migration and high birth rates are giving rise to elevated population pressure on limited available land resources. Resulting in many to settle in fringes of society, commonly under developed and high risk localities close to river banks or on unstable grounds. As such, many settlements arise without planning and access to basic civic services. Increased number of accidents and emergencies mainly involving building collapse, urban fires and road traffic accidents, are unfortunate consequences of this unplanned urban growth. Moreover, lack of basic civic

[3] *Ministry of Finance, Government of Pakistan, 2015.*

amenities i.e. non availability of clean drinking water and sewage and disposal of solid and liquid garbage/waste make the residents susceptible to infectious diseases.

3.2. Unsafe Cottage Industry in Cities

Apart from unplanned congested urban areas and unsafe road conditions the unplanned urbanization has also resulted in rapid and steady growth of cottage industries within and around populated areas, in last three decades. It is commonly observed that the cottage industries in urban areas especially in Karachi and Hyderabad totally disregard safety measures, thus, creating serious health, safety and environmental risks.

3.3. Poverty and Social Inequalities

Poverty is a major factor which contributes to the vulnerability of individual household and community. Poor segments of society have fewer choices and limited resources. Therefore, they are relatively more likely to live and work in unsafe areas exposed to potential hazards, at the same time their inferior access to facilities, resources and information makes them particularly vulnerable when a disaster strike. Out of 29 districts in Sindh, 11 Districts are categorized as extremely poor districts, while another 11 districts as poor districts (BISP survey). Although, the province is endowed with abundant natural resources and variety of economic opportunities exists, especially in urban areas, but high levels of urban and rural poverty are clear indicators of polarization in society. Unequal Opportunities, restricted access to livelihood, health, education and information, uneven distribution of resources among various socio-economic classes further intensify the vulnerabilities for certain groups in society.

3.4. Climate Change and Global Warming

The warmer climate of Sindh Province along with its unique geographical location makes it particularly vulnerable to the impacts of climate change. The rise in average temperature and humidity has started to gradually impact the province its people and their livelihoods. The climate change is giving rise to incidents of loss of biodiversity, rise in the sea level, sea water intrusion, frequent cyclones, erratic rains, drought and abnormal shifts in the weather patterns.

4. Unit summary

The province of Sindh has remained vulnerable to the impacts of a number of natural hazards. Main natural hazards which adversely affect people, infrastructure, crops and environments in province include droughts, riverine floods, earthquakes, heatwaves and coastal hazards. In addition, a number of human induced hazard occurrences like industrial and urban fires, pollution and environmental degradation have become common sight especially in urban areas. Historical data shows that province has regularly suffered from both natural and human induced disasters. The high level of risk province faces is mainly from hydro-metrological hazards i.e. floods/heavy rains, flash floods, cyclones in coastal areas, sea intrusion and droughts; in addition, due to physical location province it is also

prone to geological hazards i.e. earthquake and tsunami. The vulnerabilities of communities to these adverse events are further exacerbated by their limited risk reduction knowledge, inadequate coping capacities, overpopulation, and unplanned development and as a result of poor socio-economic conditions, especially in least developed areas of province.

Figure 3: District Wise Severity of Risk in Sindh

Source: National Disaster Management Plan 2012-2022

District Wise Severity of Risks in Sindh Province							
District	Flood	Earthquake	Tsunami	Cyclone	Drought	Institutional Arrangements	Total Risk
Karachi	4	5	5	5	5	5	30
Badin	4	3	-	5	2	5	20
Dadu	5	2	-	2	5	5	20
Hyderabad	5	4	-	4	5	1	20
Qamber Shahdadkot	5	3	-	2	4	5	20
Tando Muhammad Khan	5	4	-	4	5	1	20
Thatta	4	2	3	4	1	5	20
Tando Allahyar	4	4	-	4	5	1	19
Matiari	5	4	-	2	5	1	18
Jacobabad	5	3	-	2	5	1	17
Jamshoro	5	2	-	3	5	1	17
Kashmore	5	3	-	2	5	1	17
Mirpur Khas	4	3	-	4	4	1	17
Naushahro Feroze	5	3	-	2	5	1	17
Nawabshah	5	2	-	3	5	1	17
Shikarpur	5	3	-	2	5	1	17
Ghotki	5	2	-	2	5	1	16
Khairpur	5	2	-	2	5	1	16
Sukhur	5	2	-	2	5	1	16
Larkana	5	2	-	2	4	1	15
Tharparkar	3	2	-	4	4	1	15

Score Key	5	4	3	2	1	-
	Very High	High	Medium	Low	Very Low	Non Hazard

Further reading / References

- *National Disaster Response Plan 2010*
- *National Disaster Management -NDM Act 2010*
- *Sindh Disaster Management Plan 2008*
- *National Disaster Management Plan 2012-2022*
- *PDMA, Government of Sindh: Provincial Monsoon Contingency Plan 2017*

Unit 1.3

Name:	**CBDRM concept, its importance and process**
Learning Objective:	- To understand the concept of community based disaster risk management CBDRM and get familiarized with different steps of CBDRM process, - To know the importance and need of CBDRM for the communities in Sindh Province.
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Laptop with multimedia, flip charts, permanent markers, white board and erasable markers
Training Techniques:	PPT slides, interactive discussion followed with the Q/A session

1. Defining the term "Community"?

The term Community in disaster risk management referred to sharing of the same geographical area, belong to same ethnicity, religion, language, cast and creed. A common concept of community is that a community is harmonious, having a harmony of interest and aspirations, and bound by common values and objectives. In reality, a community can be socially differentiated and diverse. Gender, class, caste, wealth, age, ethnicity, religion, language, and other aspects divide and crosscut the community. Beliefs, interests, and values of community members may conflict.

Figure 4: Community meeting in Rural Sindh

Photo credit: https://ced.org.uk/projects/thar-pakistan/

2. Defining the term "Community Based Disaster Risk Management"?

Community Based Disaster Risk Management (CBDRM) is a process in which local communities proactively participate and take decisions with an underlying objective of saving lives, livelihoods and properties from natural or human-induced hazards. The CBDRM approach ensures that local communities are at the helm of affairs in terms of project designing, implementation and monitoring & evaluation.

Proactive involvement of communities in disaster risk management helps document indigenous knowledge and local level priorities with regard to past disasters and their impacts, vulnerable areas, and weather patterns. It helps local authorities and non-governmental organizations to formulate a practical action plan to reduce different kinds of vulnerabilities. The CBDRM is based on bottom-up approach and the aim of the approach is to reduce vulnerabilities and to strengthen peoples' capacity to cope with the disaster risks they face. The direct involvement of the community in undertaking local level risk reduction measures is a must.

3. Importance of the CBDRM Approach

CBDRM approach emphasizes that communities are not merely a group of recipients but an active stakeholder in the overall mitigation and prevention of hazards and associated risks. Under the CBDRM approach, the communities are actively involved in the disaster risk assessment, disaster risk reduction planning and implementation process. The community based risk assessment process helps document indigenous knowledge and local level priorities with regard to past disasters and their impacts, vulnerable areas, and weather patterns. It helps local authorities and non-governmental organizations to formulate a practical action plan to reduce different kinds of vulnerabilities. CBDRM approach promotes

a bottom-up process of development discourse which eventually results in implementing community-owned action plans.

Importance and Need:

1) Based on Community Perceptions and Local Knowledge
2) It Strengthens Cohesion and Cooperation within the Community
3) Promotes Community Reliance on Their Own Resources
4) Prepare Communities as First Responders
5) It Values the Communities
6) Promotes Sustainability of Risk Reduction Actions
7) Valuable and Cost beneficial

3.1. Based on Community Perceptions and Local Knowledge

The communities have local knowledge of vulnerabilities and traditional coping mechanisms suitable for their own particular conditions and environment. The CBDRM process helps document:

- Local vulnerability enhancing factors
- Indigenous knowledge and capacities
- Local level priorities and concerns
- Past disasters and their impacts
- Vulnerable areas and Weather pattern

This information helps government authorities and non-governmental organizations-NGOs to formulate more informed and practical strategies to reduce disaster risks and development in community

3.2. It Strengthens Cohesion and Cooperation within the Community

- Communities working together cohesively in crises situation have a better chance to cope with negative impacts of the event and they perform more effectively.
- CBDRM provides a platform to communities to connect more effectively with local government organizations and social structures i.e. CSOs and CBOs.

3.3. Promotes Community Reliance on Their Own Resources

- Being isolated and cut-off from outside assistance in the face of a disaster can prove to be catastrophic for communities and people, CBDRM approach encourages communities to rely on their own resources.
- Utilizing local knowledge and resources (local coping strategies) until professional assistance arrives significantly reduce community's reliance on outside assistance by minimizing their emergency needs and significantly reduce impacts of disasters.

- Moreover, during the recovery when all the external agencies have left, it is the local communities which struggle to rebuild their community in such situation reliance on their own resources becomes very essential.

3.4. Prepares Communities as the First Responders

- Due to exposure and proximity to hazards local communities are first potential victims and also assume most of the responsibilities in immediate response and dealing with the adverse impacts of hazard. The local communities respond first even before assistance from external organizations arrives, CBDRM approach prepares communities to respond effectively.
- Due to restricted access, mobility and information after a disaster or the speed and suddenness of the event, the initial period immediately following a disaster (usually 2-3 days) the affected communities may need to rely on their own resources.

3.5. It Values the Communities

- CBDRM approach emphasizes that communities are not merely a group of recipients and victims, but an active stakeholder in overall mitigation and prevention of risks.

3.6. Promotes Sustainability of Risk Reduction Actions

- CBDRM approach emphasizes that the communities have a lot to lose if they do not address their own vulnerability; while on the other hand, they gain most if they can reduce the impact of disasters resulting in sustainable community-owned risk reduction action plans

3.7. Valuable and Cost beneficial

- In developing countries and relatively poor economies the CBDRM promotes the idea of indigenous, locally available affordable solutions to reduce disaster risks.

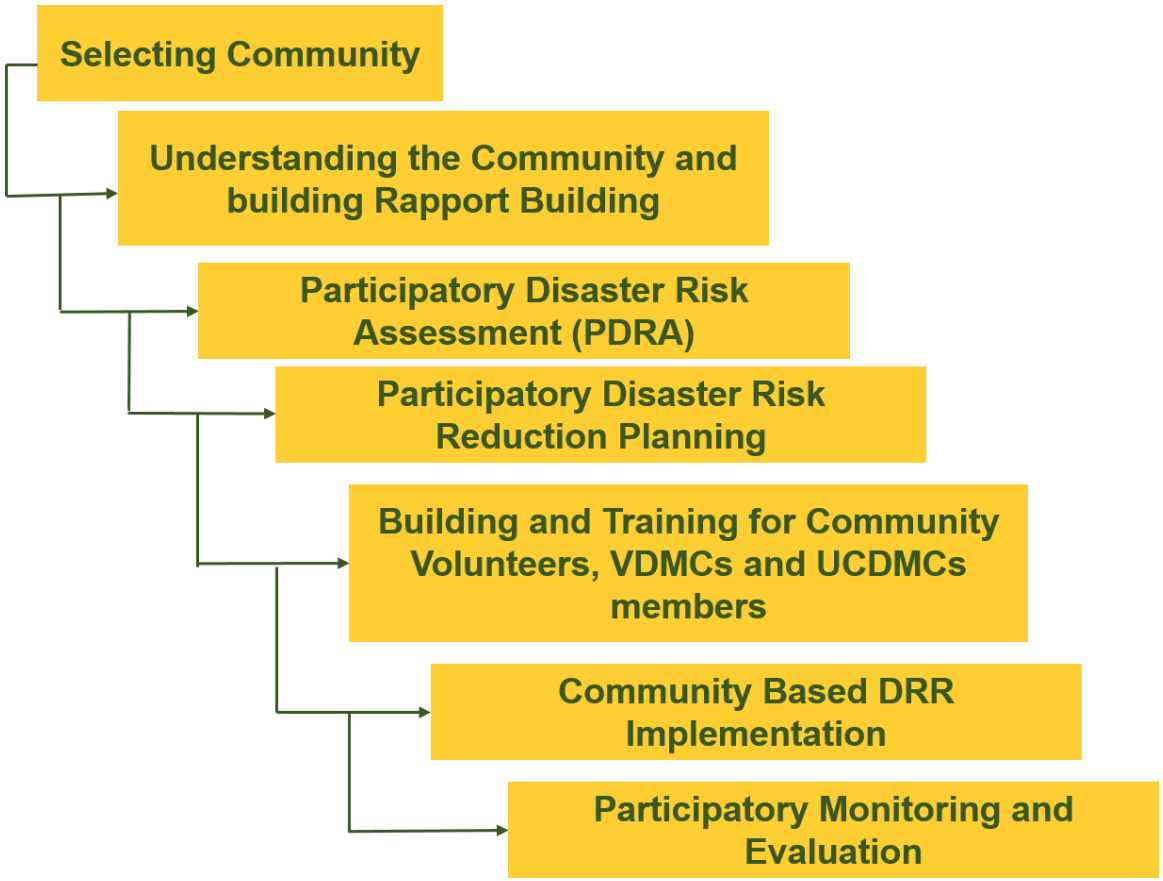
4. Community Based Disaster Risk Management Process

In the CBDRM Process, a thorough participatory disaster risk assessment is the first and essential step where detail assessment needs to be carried out to see the community's hazard exposures, vulnerabilities of the community and to analyze the existing local capacities is the basis to reduce disaster risks. The community should be involved and take lead in the process of disaster risk assessment, disaster risk reduction planning and implementation of the agreed DRR measures. This approach will guarantee that the community's real needs and resources are considered. There is more likelihood that problems will be addressed with appropriate interventions, through this process.

Although in different literature, different steps/stages have been suggested for the CBDRM process. However, according to the Asian Disaster Preparedness Center (ADPC) Thailand, there are seven sequential stages, which can be executed before the occurrence of a

disaster, or after one has happened, to reduce future risks. Each stage grows out of the preceding stage and leads to further action. Together, the sequence can build up a planning and implementation system, which can become a powerful disaster risk reduction tool. The following are the seven steps in the disaster risk management process;

Figure 5: Implementation Process through CBDRM Approach



5. Selecting the Community

This is the process of choosing the most vulnerable communities for possible assistance on risk reduction using a set of criteria. To make an informed judgment about where to work or which community to choose, a set of criteria should be developed for the selection process. Below are some considerations:

- Severity of community's exposure to risk (most vulnerable community)
- Number of people to benefit from DRM program
- Readiness of community to engage in DRM
- Accessibility of the community
- Security of staff

The affected community can be identified either by the community approach to the outsider including I/NGOs, District government or politicians etc. The affected communities can also be identified by the intermediaries or the district government authorities.

6. Understanding the Community and building Rapport Building with the Communities

This involves basically building the relationship and trust with the local people. If community members have trust in the outsiders who are working with them, then open sharing about issues, problems, concerns and solutions can take place. Outsiders can take a number of actions in order to build trust with community people. These can include the following:

- Living in the community
- Being transparent and open about who they are and what is being done
- Participating in daily life in the community, as well as community activities and cultural events
- Listening to local people about their life, issues and problems
- Learning new skills from local people
- Performing local tasks.
- They must show humility, respect for local culture, and be patient while dealing with people

As relationship is established, general position of the community in terms of social groups, cultural arrangements, economic activities, spatial characteristics, and vulnerability of different households, political and economic aspects is understood. Deeper appreciation of the community dynamics will happen later, when participatory risk assessment is undertaken.

7. Participatory Disaster Risk Assessment (PDRA)

This is a diagnostic process to identify the risks that the community faces and how people overcome those risks. The process involves hazard, vulnerability and capacity assessments. In doing the assessments, people's perception of risk is considered. The details of this section can be found in a later session on Participatory Disaster Risk Assessment.

8. Participatory Disaster Risk Reduction Planning

This follows after the analysis of the results of participatory disaster risk assessment. People themselves identify risk reduction measures that will reduce vulnerabilities and enhance capacities. These risk reduction measures are then translated into a Village or Union Council disaster risk management plans prepared by the communities with the support of Outsiders.

9. Building and Training for Community Volunteers, VDMCs and UCDMCs members

Disaster risks are better managed by a disaster management committee at local level that will ensure that risks are reduced through implementation of the DRM plan. Therefore, it is imperative to build such committees to unite the communities to address the issue in organized manners and ensure the sustainability. This committee at village level can be called as Village Disaster Management Committees (VDMCs) and at UC level, it can be called as Union Council Disaster Management Committees (UCDMCs). The basic, TOTs, technical and refresher training of the community leaders, members of the committees and volunteers are the essential ingredients in order to enable the communities to reduce the consequences of the disasters.

10. Community Based DRR Implementation

The VDMCs and UNDMCs should lead the implementation of the DRM plan and motivate other members of the community to support the activities in the plan. At this stage the community offer volunteers services and involve in the implementation process as laborers, implementers and decision makers.

11. Participatory Monitoring and Evaluation

This is a communication system in which information flows amongst all the people involved in the project; i.e. the community, the implementing staff and the support agency, concerned government agencies and donors. In the participatory process, the community volunteers, committee members are part of the monitoring and evaluation team together with the outsiders and local government stakeholders.

References

- *Asian Disaster Preparedness Center Thailand (2011); Participant's workbook on "Community Based Disaster Risk Reduction" available at www.adpc.net*
- *National Disaster Management Authority Islamabad Pakistan (2019); CBDRM training toolkit available at http://www.ndma.gov.pk/publications/Participants'%20Workbook%20-%20Urdu.pdf*
- *World Food Program Islamabad Pakistan (2011); training manual on "Community Based Disaster Risk Management".*
- *Provincial Disaster Management Authority Khyber Pakhtunkhwa (2014-15); Participant's workbook on "Community Based Disaster Risk Management".*
- *National Disaster Management Authority Islamabad Pakistan (2012); "Instructor's Guidelines on Community Based Disaster Risk Management", published under the NDMP Vol-III.*

Module-2

Disaster Management System in Pakistan and Sindh Province

Unit 2.1:	Evolution of Disaster Risk Management -DRM in Pakistan
Unit 2.2:	Disaster Management System in Pakistan, with focus on Sindh Province
Unit 2.3:	Role & Importance of CBOs in Local level CBDRM

Outcomes

Upon completion of this Module you will be able to:

- Understand how disaster management evolved in Pakistan as a proactive approach
- Familiarized with various national, international and global Disaster Risk Management/ Reduction Frameworks
- Know various DRM organization working at national, provincial and district levels in Pakistan and understand their roles, responsibilities and functions
- know the roles of Community Based Organizations - CBOs and understand importance of developing linkages of CBOs with CBDRM process at community level

Unit 2.1

Name:	**Evolution of DRM in Pakistan**
Learning Objective:	- To understand how disaster management evolved in Pakistan as a proactive approach - To get familiarized with various national, international and global Disaster Risk Management/Reduction Frameworks
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Plenary, interactive discussion, audio visual aids, and Q/A

1. Introduction

Before 2005 devastating earthquake, a reactive emergency response (Calamity Act of 1958) approach remained the predominant way of dealing with disasters in Pakistan. An Emergency Relief Cell within the Cabinet Division was serving since 1971 to provide disaster relief support at the national level. Similar institutional arrangements existed at the provincial level in the form of relief commissioners. Year 2005 was a turning point for DRM in Pakistan. 2005 witnessed two significant events i.e. in 2005 Pakistan became a signatory to the Hyogo Framework for Action (HFA), indicating a shift toward more comprehensive and proactive disaster management approach and the country was also struck by the catastrophic earthquake, Earthquake 2005.

The sheer scale of the tragedy highlighted Pakistan's vulnerability to disasters and further enforced country's commitment to better risk reduction practices, which later resulted in the promulgation of the National Disaster Management Ordinance (NDMO) in 2006. Consequently, a comprehensive and proactive disaster risk management system evolved in Pakistan. Since 2005, significant progress at all administrative levels of government and civil society has been made in this context. It is also important to highlight that the policy shift at national level, from reactive and strict compartmentalized approach followed in DRM and socio-economic development process was an outcome of recommendations put forward by Hyogo Framework for Action (HFA) 2005-15. The recommendations of HFA reformed DRM policies and practices globally, including Pakistan by stressing upon a need for embracing DRM as a holistic process to formulate risk informed development policies and integration of DRR strategies in development practices for reducing risks and building resilience at national, regional and global levels.

2. Disaster Risk Management-DRM as an International Agenda

2.1. International Decade for Natural Disaster Reduction (IDNDR 1990-1999)

The United Nations General Assembly designated the 1990s as the International Decade for Natural Disaster Reduction. The basic objective was to decrease the loss of life, property destruction, social and economic disruption caused by natural disasters. The IDNDR was launched on 1st January 1990, following the adoption of Resolution 44/236 (22 December 1989). The decade was intended to reduce, through concerted international action, especially in developing countries, loss of life, property damage and social and economic disruption caused by natural disasters. In order to support the activities of the decade, a Secretariat was established at the United Nations Office in Geneva, in close association with UNDRO.

2.2. Yokohama Strategy and Plan of Action for a Safer World

During 23-27 May 1994, the first World Conference on Natural Disaster Reduction was held in Yokohama, Japan. The Conference adopted the Yokohama Strategy for a Safer World, mainly consisting of guidelines for natural disaster prevention, preparedness and mitigation. It was a turning point in the history of DRR efforts, as the socio-economic aspects of vulnerable communities were taken into account. The word conference outlined Yokohama Principles to prevent, mitigate and reduce disaster risk in developed and less developed countries.

2.3. The Hyogo Framework for Action (2005-2015)

At the end of IDNDR in 2005, international community met in Kobe, japan, to review the Yokohama strategy and progress made during the last decade. Built upon the lesson learned from Yokohama Strategy, 168 Member States attended the UN World Conference on Natural Disaster Reduction (WCDR, Kobe, Japan, 18-22 July 2005). After the three days deliberate discussion, the conference adopted Hyogo Framework for Action during 2005 to 2015. The HFA is a non-binding but politically authoritative obligation to building the resilience of the nations and communities to disasters by 2015. It outlines three strategic goals and five broad priority areas for action plus general considerations, key activities under each priority area and role of states and other stakeholders involved in the implementation. The United Nation International Strategy for Disaster Reduction (UN-ISDR) Secretariat is the custodian of the implementation and follow-up of the Hyogo Framework for Action 2005 – 2015.

The five priorities for action are as follows;

- Priority 1: Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation
- Priority 2: Identify, assess and monitor disaster risks and enhance early warning
- Priority 3: Use knowledge, innovation and education to build a culture of safety and resilience at all level
- Priority 4: Reduce the underlying risk factors
- Priority 5: Strengthen disaster preparedness for effective response at all levels

2.4. Sendai Framework for Disaster Risk Reduction (SFDRR 2015-2030)

After the successful completion of the HFA in 2015, the Sendai Framework for Disaster Risk Reduction (SFDRR-2015-2030) was adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015 as follow-up. The SFDRR aims to reduce socio-economic vulnerabilities to disaster and as well as dealing with the environmental and other hazards that trigger them. The Sendai Framework is a 15- year non-binding agreement which recognizes that the state has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government and the private sector. The SFDRR sets seven targets for coming 15 years which are as follows;

- Target 1: Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015
- Target 2: Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015
- Target 3: Reduce direct disaster economic loss in relation to global Gross Domestic Product (GDP) by 2030
- Target 4: Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030
- Target 5: Substantially increase the number of countries with national and local disaster risk reduction strategies by 2030
- Target 6: Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030
- Target 7: Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030

3. Disaster Risk Management as a National Agenda in Pakistan

The paradigm shift from a reactive towards proactive approach was a result of major disasters occurrences in the recent century also the global International commitments. Below are some of the important achievements made by Pakistan since 2005;

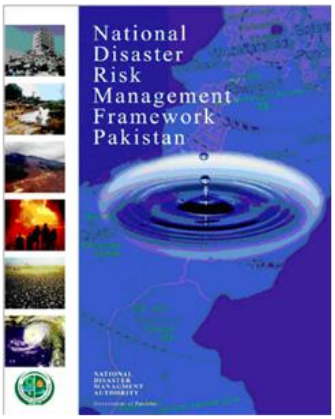
3.1. National Disaster Management Ordinance (NDMO-2006)

In the aftermath of the lessons learnt from the devastating 2005 earthquake, the Government of Pakistan passed the National Disaster Management Ordinance- NDMO in 2006. The Ordinance stipulated establishment of a robust disaster management system at National, Provincial and District Levels.

3.2. National Disaster Management Act (NDM Act-2010)

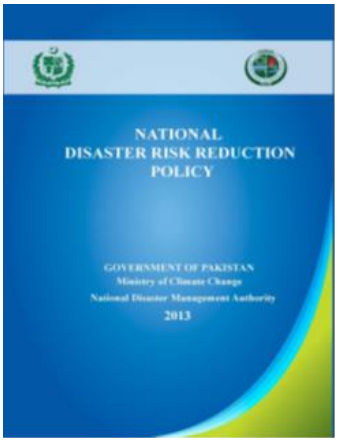
The NDMO 2006 remained valid till it was replaced by the National Disaster Management Act approved by the National, Senate, and all Provincial Assemblies in 2010. The NDM Act 2010 is a guiding document which requires establishing a dynamic disaster management system all over the country.

3.3. National Disaster Risk Management Framework (NDRMF-2007)



After the Promulgation of National Disaster Management Ordinance during 2006, the National DRM Framework- NDRMF was prepared to take strategic direction to introduce sustainable social, economic and environmental development in Pakistan through reducing risks and vulnerabilities, particularly those of the poor and marginalized people. As a result of the NDRMF implementation strategies, we can see evolution of a holistic disaster management system in the country in the form of establishment of the National, Provincial and District Disaster Management Authorities, discussed in detail subsequently.

3.4. National Disaster Risk Reduction Policy 2013



The National Disaster Management Authority- NDMA formulated National DRR Policy which was approved by the National Disaster Management Commission- NDMC in 2013. This policy provides an overall guiding framework for addressing the high levels of disaster risks in Pakistan. It covers both natural and man-made hazards.

3.5. National Disaster Management Plan (2012-2022)

To set a strategic direction toward proactive approach for managing disasters in the country, the NDMA prepared and approved the National Disaster Management Plan- NDMP after exhaustive consultation with the technical and financial support of Japanese International Cooperation Agency - JICA during 2012. The NDMP is a comprehensive national plan till 2022. It comprises of a total investment cost of USD 1,040.9 million (PKR 92.02 billion). The document is very comprehensive and consists of 4 volumes. A main planning document accompanied by three supporting volumes, which are as under;

- National Disaster Management Plan: Main Plan
- Human Resource Development Plan on Disaster Management: Vol. I
- Multi-Hazard Early Warning System Plan: Vol. II
- Instructors' Guidelines on Community Based Disaster Risk Management: Vol. III

The NDMP has 10 priority areas to be addressed during 2012-2022. These priority areas are as follows;

- Priority Action -1: Establish the institutional and legal system for disaster management.
- Priority Action -2: Prepare disaster management plans at various levels.
- Priority Action -3: Establish national hazard and vulnerability assessment.
- Priority Action -4: Establish multi-hazard early warning systems.
- Priority Action -5: Promotion of training, education and awareness in relation to disaster management; and establish a national emergency response system.
- Priority Action -6: Strengthen the awareness programme on disaster risk reduction at the local level.
- Priority Action -7: Infrastructure development for disaster risk reduction.
- Priority Action -8: Mainstreaming disaster risk reduction into development.
- Priority Action -9: Establish a national emergency response system.
- Priority Action -10: Capacity development for post-disaster recovery

Further Reading and References

- *Yokohama Strategy and Plan of Action for a Safer World available at https://www.ifrc.org/Docs/idrl/I248EN.pdf*
- *United National International Strategy for Disaster Reduction; UN World Conference on Natural Disaster Reduction (WCDR, Kobe, Japan, 18-22 July) available at https://www.unisdr.org/2005/wcdr/wcdr-index.htm*
- *United National International Strategy for Disaster Reduction; Sendai Framework for Disaster Reduction 2015-2030; available at https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf*
- *National Disaster Management Authority; National Disaster Management Ordinance 2006 available at http://www.ndma.gov.pk/Publications/National%20Disaster%20Management%20Ordinance%202006.pdf*
- *National Disaster Management Authority; National Disaster Management Framework 2007; available at http://www.ndma.gov.pk/plans/National%20Disaster%20Risk%20Management%20Framework-2007.pdf*
- *National Disaster Management Authority; National Disaster Management Act 2010; available at http://www.ndma.gov.pk/files/NDMA-Act.pdf*
- *National Disaster Management Authority; National Disaster Management Act 2010; available at http://www.ndma.gov.pk/plans/drrpolicy2013.pdf*
- *National Disaster Management Authority; National Disaster Management 2012-2022; available at http://www.ndma.gov.pk/plans/NDMP-EXECUTIVE%20SUMMARY.pdf*

Unit 2.2

Name:	**Disaster Management System in Pakistan with focus on Sindh Province**
Learning Objective:	- To know various DRM organization working at national, provincial and district levels in Pakistan -To understand roles, responsibilities and functions of various disaster management organizations at national, provincial, district and local levels.
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Plenary, interactive discussion, audio visual aids, and Q/A

1. Introduction and Background

Before 2005, Emergency Relief Cell (ERC) was the only national level body responsible for disaster relief at national level. Its role was to provide assistance in cash and kind to supplement the resources of the Provincial Governments in any event of major disaster. Likewise, at provincial levels, after the abolition of one unit in 1971, the provinces adopted the 1958 Calamities Act with some changes as per their own requirements. In Punjab, a dedicated department with the name of "Relief and Crisis Management Department" was established in 1975 and in other provinces Senior Member Board of Revenue (SMBR) was designated as Relief Commissioner in ex-officio capacity. This DRM system persisted till the nation confronted one of the biggest disaster management challenges since its birth.

2005 was a turning point for DRM in Pakistan. 2005 witnessed two significant events i.e. in 2005 Pakistan became a signatory to the Hyogo Framework for Action (HFA), indicating a shift toward more comprehensive and proactive disaster management approach and the country was also struck by the catastrophic earthquake, Earthquake 2005. The sheer scale of the tragedy highlighted Pakistan's vulnerability to disasters and further enforced country's commitment to better risk reduction practices, which later resulted in the promulgation of the National Disaster Management Ordinance (NDMO) in 2006. The ordinance provided legal and constitutional arrangements for disaster management at federal, provincial and district levels. The NDMO provided the National Disaster Management Commission (NDMC) as the apex body for managing disasters, with the National Disaster Management Authority (NDMA) as its administrative arm. The National Disaster Management Authority is mandated to deal with the 'entire spectrum of disaster management in the country.

2. Institutional Framework (Disaster Risk Management in Pakistan)

2.1. Before 2005

- The West Pakistan National Calamities (Prevention and Relief) Act 1958: Pakistan National Calamities (Prevention and Relief) Act 1958 provides for the maintenance and restoration of order in areas affected by calamities, and relief against such calamities. The Calamities Act 1958 was mainly focused on organizing emergency response. This act was later amended when the four provinces were created in 1971. After the abolition of one unit in 1971, the provinces adopted the 1958 Calamities Act with some changes in content as per their requirements. In province of the Punjab, a dedicated department with the name of "Relief and Crisis Management Department" was established in 1975. In other provinces, Senior Member Board of Revenue (SMBR) was designated Relief Commissioner ex-officio.
- Emergency Relief Cell (ERC). Emergency Relief Cell (ERC) was created within the Cabinet Division in 1971 and is responsible for disaster relief at national level. It provides assistance in cash and kind to supplement the resources of the Provincial Governments in event of major disaster. Additionally, it extends helping hand to the calamity stricken friendly countries as and when required. ERC coordinates activities

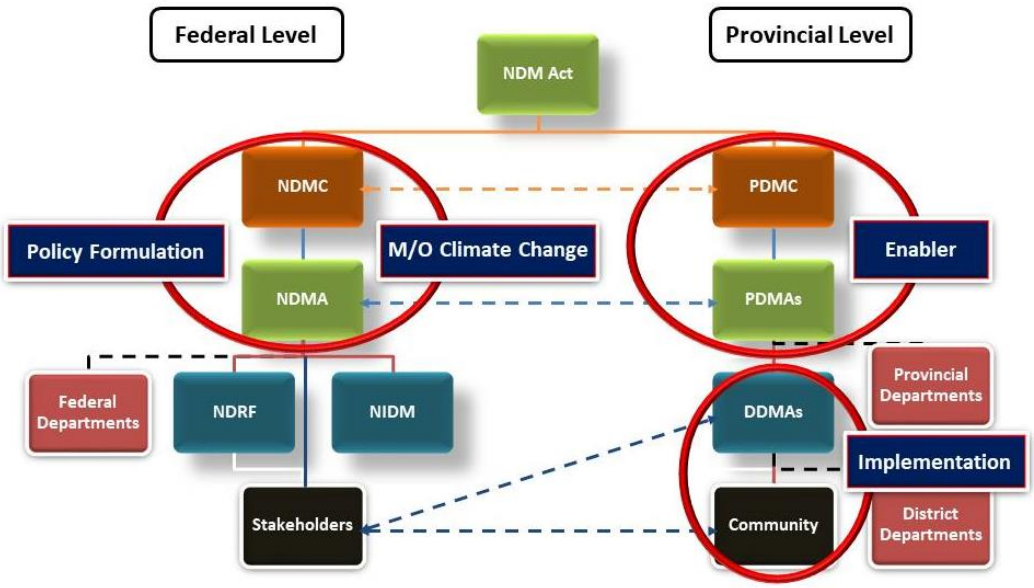
of all the related agencies i.e. Federal divisions, Provincial Governments, semi-governmental, international and including national aid giving agencies during relief operation. It administers the Prime Minister's Flood Relief Fund and also maintains an Aviation Squadron with a fleet of helicopters to assist rescue operations and enable officials to visit the affected areas.

- National Crisis Management Cell (NCMC). NCMC was established in July 1999 under Anti-Terrorist Act in the Ministry of Interior, Islamabad. The main function of the NCMC is to collect information regarding various emergencies in the country. It is also tasked to coordinate with Provincial Crisis Management Cell and other relevant agencies to collect relevant information. In addition, it is responsible for coordinating plans for emergency relief services in case of emergency situation.

2.2. After 2005

- National Disaster Management Act 2010: In December, 2010, the NDMO 2006 was converted into an Act of the Parliament as the National Disaster Management -NDM Act 2010, with retrospective effect from August 2007. A three tier hierarchical framework is put forward with National Disaster Management Commission at the top headed by the Prime Minister being responsible for national disaster risk management policymaking in the country. As per the Act, National Disaster Management Authority is the focal point for the coordination and implementation of disaster management policies in the country. The second tier consists of the Provincial Disaster Management Commissions and Authority and the third tier, which involves District Disaster Management Authorities. All bodies are responsible for drawing up Disaster Management policies/ plans and performing various functions at their respective administrative levels. Their roles, functions and responsibilities will be discussed subsequently.

Figure 6: National Disaster Management Institutional Framework After 2005



3. Disaster Management and Response Organizations (National Provincial and District)

3.1. National/Provincial Disaster Management Authorities

Under the NDM Act, NDMA serves as the focal point and coordinating body to facilitate implementation of all disaster management activities in country. Disaster Management Authorities at various administrative levels are made directly responsible to coordinate with all stakeholders, including ministries, divisions, departments, and humanitarian organizations for implementing disaster risk management and emergency response activities. The functions and roles of various disaster management authorities as specified in National Disaster Management Act 2010 are as below:

Table 2: Roles and Functions of NDMA

- Act as the implementing, coordinating and monitoring body for disaster management.
- Prepare the National Plan to be approved by the National Commission.
- Implement, coordinate and monitor the implementation of the National policy.
- Lay down guidelines for preparing disaster management plans by different Ministries or Departments and the Provincial Authorities.
- Provide necessary technical assistance to the Provincial Governments and the Provincial Authorities for preparing their disaster management plans in accordance with the guidelines laid down by the National Commission.
- Coordinate response in the event of any threatening disaster situation or disaster.
- Lay down guidelines for, or give directions to the concerned Ministries or Provincial Governments and the Provincial Authorities regarding measures to be taken by them in response to any threatening disaster situation or disaster.
- For any specific purpose or for general assistance requisition the services of any person and such person shall be a co-opted member and exercise such power as conferred upon him by the Authority in writing.
- Promote general education and awareness in relation to disaster management; and
- Perform such other functions as the National Commission may require it to perform

Table 3: Roles and Functions of PDMA

- Formulate the provincial disaster management policy obtaining the approval of the Provincial Commission.
- 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 for preparation of disaster management plans by the Provincial Departments and District Authorities.

- Evaluate preparedness at all governmental or non-governmental levels to respond to disaster and to enhance preparedness.
- Coordinate response in the event of disaster.
- Give directions to any Provincial department or authority regarding actions to be taken in response to disaster.
- Promote general education, awareness and community training in this regard.
- Provide necessary technical assistance or give advice to district authorities and local authorities for conveying out their functions effectively.
- Advise the Provincial Government regarding all financial matters in relation to disaster management.
- Examine the construction in the area and if it is of the opinion that the standards laid down has not been followed may direct the same to secure compliance of such standards.
- Ensure that communication systems are in order and disaster management drills are being carried out regularly. Perform such other functions as may be assigned to it by the National or Provincial Authority.

Table 4: Roles and Function of DDMA

- Prepare a disaster management plan including district response plan for the district.
- Coordinate and monitor the implementation of the National Policy, Provincial Policy, National Plan, Provincial Plan and District Plan.
- Ensure that the areas in the district vulnerable to disasters are identified and measures for the prevention of disasters and the mitigation of its effects are undertaken by the departments of the Government at the district level as well as by the local authorities.
- Ensure that the guidelines for prevention, mitigation, preparedness and response measures as laid down by the National Authority and the Provincial Authority are followed by all departments of the Government at the district level and the local authorities in the district.
- Give directions to different authorities at the district level and local authorities to take such other measures for the prevention or mitigation of disasters as may be necessary.
- Lay down guidelines for preparation of disaster management plans by the departments of the Government at the districts level and local authorities in the district.
- Monitor the implementation of disaster management plans prepared by the Departments of the government at the district level.
- Lay down guidelines to be followed by the Departments of the Government at the district level
- Organize and coordinate specialized training programmes for different levels of officers, employees and voluntary rescue workers in the district.
- Facilitate community training and awareness programmes for prevention of disaster or mitigation with the support of local authorities, governmental and non-governmental 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.
- Coordinate with, and give guidelines to, local authorities in the district to ensure that pre-disaster and post-disaster management activities in the district are carried out promptly and effectively.
- Review development plans prepared by the Departments of the Government at the district level, statutory authorities or local authorities with a view to make necessary provisions therein for prevention of disaster or mitigation.
- Identify buildings and places which could, in the event of disaster situation be used as relief centers or camps and make arrangements for water supply and sanitation in such places.
- Establish stockpiles of relief and rescue materials or ensure preparedness to make such materials available at a short notice.
- Provide information to the Provincial Authority relating to different aspects of disaster management.
- Encourage the involvement of non-governmental organizations and voluntary social-welfare institutions working at the grassroots level in the district for disaster management.
- Ensure communication systems are in order, and disaster management drills are carried out periodically.
- Perform such other functions as the Provincial Government or Provincial authority may assign to it or as it deems necessary for disaster management in the District.

3.2. Provincial Relief Department

At provincial levels the Relief Commissioners are mandated and made responsible for coping with the aftereffects of disaster situation. Funds are made available to Relief Commissioners which may be released to the District Coordination Officers for provision of facilities to victims as per the rate of compensation for casualties, houses, and crop damages decided by provincial technical committees. All relief items or goods, cash, and grants are distributed by the DCO through the district Damage Assessment Committee which includes officers from the line agencies, representatives of district and Tehsil Councils and members of local NGOs.

3.3. Local Authorities

There are three tiers of local government in Pakistan i.e. district, tehsil and union council. The local authorities are required ensure that its officers and employees are trained for disaster management. They are also required to ensure that resources relating to disaster management are so maintained as to be readily available for use in the event of any threatening disaster situation or disaster. Moreover, they are also responsible for ensuring that all construction projects under its or within its jurisdiction conform to the standards and specifications laid down for prevention of disasters and mitigation by the National, Provincial and the District Authority. In addition, they are also required to carry out relief, rehabilitation and reconstruction activities in the affected area in accordance with the

Provincial Plan and the District Plan and may take such other measures as may be necessary for the disaster management. Details of disaster management roles and functions are further discussed subsequently.

3.4. Armed Forces

The Armed Forces have always contributed very effectively in emergency response operations and provided immediate relief through massive air and ground efforts. The Armed Forces, although not trained to perform / conduct rescue and post-disaster relief operations, are utilized by the civil administration because of readily available manpower and national resources with them. The functions are mentioned below:

- Work in support of the civil administration in relief, rescue and evacuation work.
- Liaison with the civil administration in search and rescue operations and provide available public/national resources like helicopters, airplanes, ships etc. for evacuation relief and recovery.
- Help to prepare flood contingency and relief operation plans.
- Assist the civil administration in setting up camps and tent villages and organize medical camps in close coordination with relevant health ministry/department for affected population
- Provide security during the disaster if required.

3.5. Civil Defense

The Civil Defense Department was established through an ordinance in 1951. It is now governed through the Civil Defence Act 1952. Before 1993, it was mandated to "take measure not amounting to actual combat, for affording defense against any form of hostile attack by a foreign power or for depriving any form of hostile attack by a foreign power of its effects, wholly or in part, whether such measures are taken before during or after the time of attack". However, after some time, it was assigned the additional task during peace to take remedial measures against natural or manmade disasters.

3.6. Pakistan Red Crescent Society (PRCS)

PRCS has contributed widely to disaster response in Pakistan with the support of other national societies. It contributes significantly in providing relief, recovery, reconstruction and capacity building activities. Presently it is working in all four provinces and AJK, in 80 districts and has a core staff of nearly 1,000. PRCS has a huge network of 50,000 volunteers. It primarily works in disaster preparedness and response.

3.7. Emergency Response Services (TMO and City Fire Fighting Services and Rescue 1122)

The main function of the firefighting services is only to "extinguish fire". The municipal civic authorities at Tehsil level are responsible for the provision of firefighting. The Punjab

Emergency Service is known as Rescue 1122 is provincial emergency response service. It is responsible for handling all types of emergencies, including fire emergencies.

3.8. Local Charity Organizations e.g. Edhi Foundation, Amman, Ansar Burni, Chippa Ambulance Services, Alkhidmat Foundation etc.

The local charity organizations provide relief services, particularly ambulance services, evacuation, food and nonfood items for victims of small to largescale emergency/disasters in the country.

3.9. Non-Governmental Organizations

NGOs both international and local play an important role in disaster management. NGOs collaborate with national, provincial and district level disaster management authorities for relief operation and provide relief services to sustain life, reduce physical and emotional distress, and promote recovery of disaster victims.

3.10. Community Based Organizations (CBOs)

Community based organizations (CBO) play a major role in the relief activities whenever, and wherever any disaster happens. The CBOs mainly focus on the emergency response and relief activities and their capacity is very limited or nonexistent in Disaster Risk Reduction (DRR) activities. Therefore, it is important to build the capacity of CBOs at village level along with government officials. CBOs can be trained in the use of local early warning system, evacuation, first aid, search and rescue, firefighting etc. The provision of Citizen Community Boards (CCBs) in the Local Government Ordinance (LGO 2001) provides good grounds to organize communities and mobilize resources for issues like local level emergency and disaster risk management.

3.11. United Nations (UN) Agencies/ Bilateral and International Donors

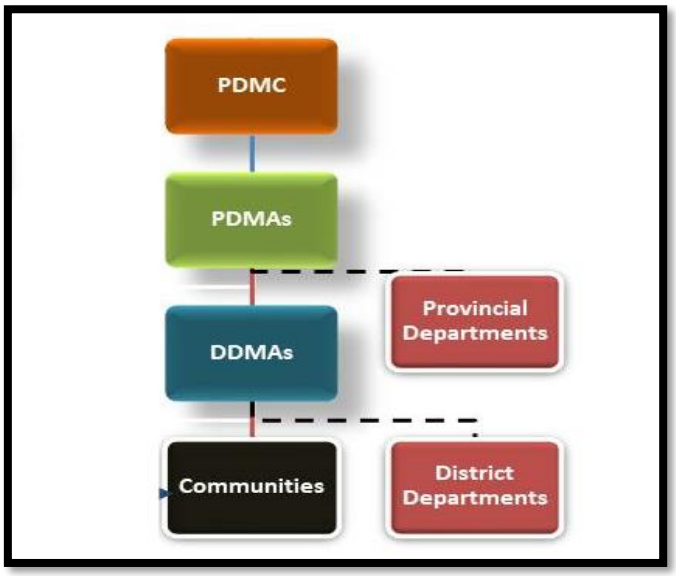
UN and other international agencies play a key role in disaster management and emergency response especially in assessment, planning, coordination, response, recovery and longer term disaster risk reduction programme. UN takes a lead role in establishing the Inter Agency Standing Committee (IASC). The main purpose of the IASC is to organize and coordination meetings of UN and INGOs on weekly basis to monitor Cluster System Response of various agencies. In addition to that, the UN plays an important role in capacity building of public sector in policy formulation in disaster management, providing technical support to provinces and districts in disaster management planning, strengthening public sector organizations in emergency response and disaster preparedness through trainings

4. Disaster Management System in Sindh

At present, an effective system of Provincial/Regional Disaster Management Commissions and Authorities exists to facilitate implementation of disaster risk management activities in the country. The Provincial/Regional Commissions are the policy making bodies, while the Disaster Management Authorities are the implementing and coordinating arms. Disaster Risk Management is a provincial subject, the Provincial/Regional Governments have crucial role in the implementation of disaster risk management policies, strategies and programmes.

Under Provincial Disaster Management Commission (PDMC) will is chaired by the Chief Minister, Sindh PDMA Sindh is proactively striving for implementation of disaster risk management policies, strategies and programmes in the province. It is playing an important role in managing various disaster situations in province. In the past, its role and efforts have been commendable during unprecedented floods of 2010 followed by heavy monsoon rainfalls of 2011, flash flooding in 2012 and in all subsequent disasters to control the situation and to save lives. It regularly coordinates all disaster management activities, especially for floods, with district administrations, line departments, armed forces and other stakeholders. Moreover, it constantly seeks inputs from host of disaster management technical experts and all relevant departments to identifying gaps and challenges in province for initiating effective disaster and emergency response management actions. The foremost goals of PDMA include reducing various disaster risks faced by the communities; increase the response capacities of communities and relevant departments and also to reduce potential resource and knowledge gaps in the province.

Figure 7: Institutional Structure of Disaster Management at Provincial Level



4.1. District Disaster Management Authority (DDMA)

The NDM Act 2010 stipulates that District Disaster Management Authorities to be established by the Provincial Governments in all districts on priority basis. The District DRM Authority will comprise of the head of local council at district level, District Coordination Officer, District Police Officer ex-officio and EDO Health etc. The local government can nominate other officers as members of the DDMU. They may include EDOs for revenue, education and agriculture, Red Crescent, NGOs, media, private sector, or any other local important stakeholder. NDM Act 2010 specifies the establishment and subsequent roles and functions of bodies till DDMUs only. The establishment and assigning of roles and responsibilities at successive lower tiers of DM organization is at the disposal of respective provincial and district governments.

4.2. Tehsil / Taluka Disaster Management Committee (TDMC)

TDMC is the frontline institution for disaster risk management, reduction and response. TDMC will synchronize and implement disaster risk management activities in line with district management plan at Tehsil level. For many departments, this is the lowest level of administration where they interact directly with communities and could play a significant role in promoting disaster risk reduction. Taluka and town Nazim will lead in risk reduction and response operations with the help of taluka or town municipal officers in consultation with DDMA. TDMC will be a bridge between Government and the communities in relation to disaster management.

4.3. Union Council Disaster Management Committee (UCDMC)

Union councils are the lowest tier in the government structure, elected representatives from the village and ward levels form part of these bodies. These bodies have in important role in allocation of resources for local development works. Union councils can play an important role in advocating demands of communities to the District and Tehsil Disaster Management Authorities/Committees. Head of the Local council or Administration shall be the chairperson of the UCDMC. The Union Council plays an important role in relief distribution at village level in the affected area.

4.4. Village Disaster Management Committee (VDMC)

Subsequent to the UCDMC, the next lower tier of the DM committee is Village Disaster Management Committee (VDMC). The VDMC can play a pivotal role as the committee members are locals and at the forefront against the disasters. Therefore, stronger and organized village committee is essential for effective response. Depending upon the population of the villages, the VDMC members can be increased or decreased. However, there should be at least 15 to 20 members in a balanced VDMC.

Further Reading and References

- *United National International Strategy for Disaster Reduction; Sendai Framework for Disaster Reduction 2015-2030; available at https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf*
- *National Disaster Management Authority; National Disaster Management Ordinance 2006 available at http://www.ndma.gov.pk/Publications/National%20Disaster%20Management%20Ordinance%202006.pdf*
- *National Disaster Management Authority; National Disaster Management Framework 2007; available at http://www.ndma.gov.pk/plans/National%20Disaster%20Risk%20Management%20Framework-2007.pdf*
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- *National Disaster Management Authority; National Disaster Management Act 2010; available at http://www.ndma.gov.pk/plans/drrpolicy2013.pdf*
- *National Disaster Management Authority; National Disaster Management 2012-2022; available at http://www.ndma.gov.pk/plans/NDMP-EXECUTIVE%20SUMMARY.pdf*

Unit 2.3

Name:	**Role & Importance of CBOs in Local level CBDRM**
Learning Objective:	- To know about Community Based Organizations –CBOs and how they are organized at community level - To understand how CBOs function and their roles & importance in local level CBDRM.
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Group work, group presentation, Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Laptop with multimedia, flip charts, permanent markers, white board and erasable markers

1. Defining the Community Based Organizations (CBOs)

Community Based Organizations consist of all public or private nonprofit organization that are present and representing a community or a significant segment of a community and works to meet community needs. Most of the CBOs are formed to provide services to people with development perspectives.

They are best positioned to effectively carry out activities and plans affecting the lives of the communities that include socio-economic development, natural resources management, environmental conservation or disaster management. CBOs are made up of community representatives and one of their aims is to ensure that decision makers take notice of community concerns.

2. Importance of the CBOs in community development planning and implementation

Community based organization aims to organize, mobilize and educate people to build a sense of community. By doing so, the community gains power or influence over issues concerning their welfare and development. Strengthening groups at the grassroots level empowers the community to direct their own path to some extent, holding government and private organizations accountable for policies and programs that directly impact the community.

They are actively engaged and playing important role in the community development and planning and try to solve problems with joint action of community representatives and volunteers with main aim in mind of sustainable development. Below are some of the advantages of the community based organizations. Their main tasks are to:

- Provide a platform for the community to come together and discuss development issues;
- Analyse the causes of problems and solutions;
- Communicate with decision makers to share planned action and obtain their endorsement;
- Galvanize community members to implement planned solutions;
- Mobilize internal or locally available resources and external resources (outside the community) to implement identified solutions;
- Raise community awareness and promote community action on environmental and disaster issues and livelihood options;
- Build capacity of community members;
- Carry out monitoring and evaluation.

3. Formation of Community Based Organizations

Normally CBOs exists in various communities across Pakistan in following hierarchy. Communities are assisted by NGOs and Civil Societies Organizations to form such community based organizations to work for their own welfare and rights.

3.1. Community Organization (COs)

- This the lowest participatory body where the community members can take part actively
- Each CO include men and women with number of members within range of 15-25.
- At least 50% should be women's COs

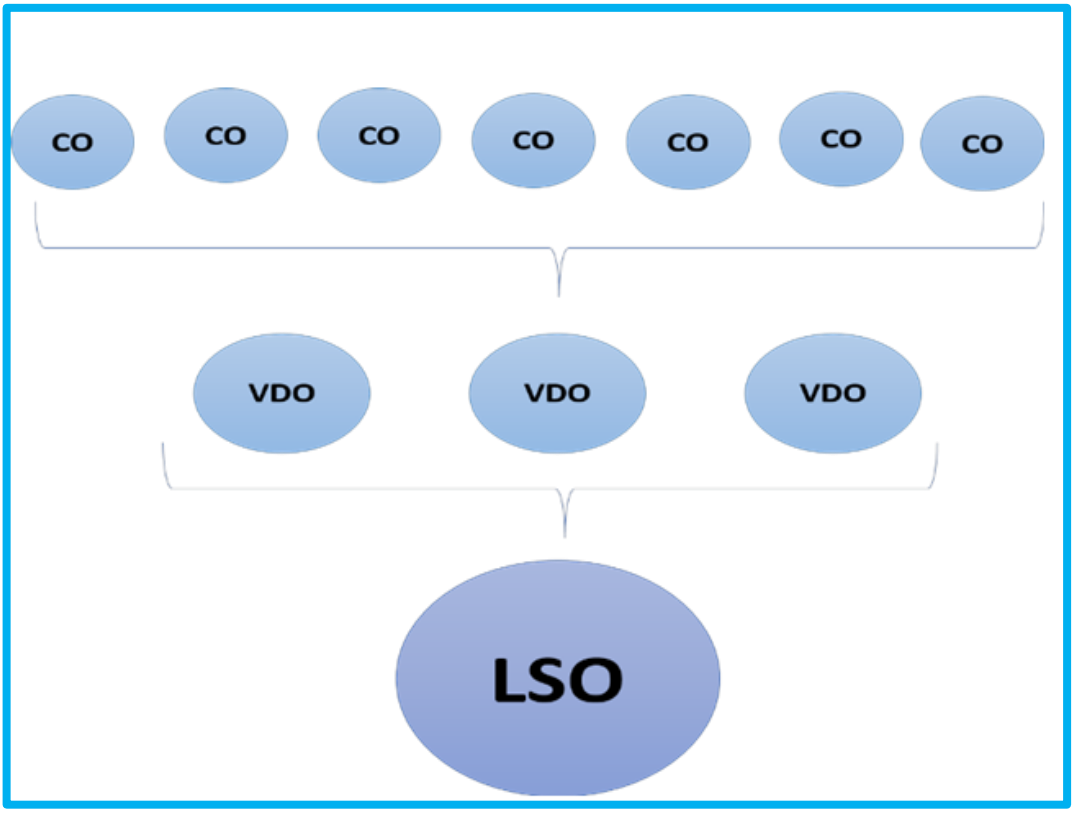
3.2. Village Development Organization (VDOs)

- Many COs can form to make one VDO. It is like a federation of the COs
- It works like general body and management committee
- Include 100% of the poorest households in VDO
- All COs shall be members of the VDO

3.3. Local Support Organization (LSOs)

- It is federations where all VDOs can form a LSO normally at Union council levels
- It is an executive committee and consist of general body
- All villages preprinted in the LSO

Figure 8: Hierarchy of Community Based Organizations in Pakistan



4. Role of CBOs in the local level CBDRM

CBOs are radical point for development and welfare initiatives at the community level and can be very useful source in mobilizing financial and human resources for CBDRM as well as can take support from each other during event of disaster. The CBOs volunteers trained under the CBOs can be an asset which we essentially require to reduce the consequences of the disaster, reduce vulnerabilities and increase local level capacities.

Photo credit: https://communityworldservice.asia/place/pakistan/sindh/page/8/

Figure 9: Community meeting with Government officials

In this regard, we strongly suggest that members of the CBOs should also take part in the local level disaster management committees and can be an active member of both committees if they are residing in the same target community. As their capacities are already enhanced so they can be very useful sources. Further they can utilize resources of CBOs during any disaster or emergency. If they are associated with the local level CBDRM process, their own capacities can also be increased in reducing the community risk.

5. Linking CBOs with Local Disaster Management Committees

We have mentioned above that CBOs are playing very important role in the development and welfare of the communities. Similarly, their role can't be ignored in the local level CBDRM programme for making target communities as disaster resilient segment of the societies. At local level village and union council level disaster management committees are the one responsible for working with the communities to prepare for and respond to emergencies and disasters with joint efforts. They help communities in reducing their vulnerabilities and building local capacities to withstand against the natural and human induced hazards. As a lesson learnt, we are witnessed that in most of the NGOs based CBDRM project running at local level, one of an important intervention is to establish local level disaster management committees i.e. VDMCs and UCDMCs who work very effectively and considerable progress can be seen when the project is at full swing. However, we have seen that whenever the project is completed, the local level disaster management committees also become dormant and redundant either due to financial and human resources constraint or having weak link with the Tehsil and Disaster Management setup. The formation of such committees can play very important role before, during and after the disasters at local level and can raise awareness and helping in preparing communities to face disasters if they work round the clock and on regular basis.

6. Conclusion: Roles of CBOs in Community Level DRM Process

The CBOs can play vital role in rejuvenating and making alive village and community level disaster management committees because they can help in developing close linkages with the decision makers, especially with the district and tehsil disaster management authorities by sharing planned actions, develop linkages and can further support in mobilizing internal and external resources to implement DRR projects at local level. They can further help in raising community awareness and promote community owned action to sustain the local disaster management committees and motivate the communities to actively participate and work for the committees to bring behavioral changes and change the mindset from reactive to proactive approaches. It is therefore suggested that members/volunteers working for the CBOs should also take part and become active members of the VDMCs/UCDMCs to continue struggle for reducing risk and their role will be more important once I/NGOs close their CBDRM focused project in any identified areas.

References

- *Rural Support Network (PSPN); Operational manual for Social Mobilization 2009 and available at http://www.rspn.org/index.php/publications/manuals-and-guidelines/*
- *Associated programme on flood management (2013); "How can CBOs play a role in flood management available at https://www.floodmanagement.info/how-can-community-based-organizations-cbos-play-a-role-in-flood-management/*

Module-3

Disasters and their impacts on individuals and communities

Unit 3.1:	Physical, social, psychological and economic impacts of natural hazards
Unit 3.2:	Vulnerable segments within communities i.e. women, children, elderly, people with disabilities and marginalized groups
Unit 3.3:	Health impacts of natural hazards and concept of Triage systems in mass casualty incident management
Unit 3.4:	Introduction to Sphere Standards

Outcomes

Upon completion of this Module you will be able to:

- Know various physical, social, psychological and economic impacts of natural hazards
- Learn differential vulnerability and specific needs of women, children, elderly, disabled and marginalized group within community, created by hazardous situation
- know the importance of vulnerable people and groups inclusive disaster risk reduction process
- Know direct and indirect, physical and psychological adverse impacts of various hazard on human health and wellbeing
- Familiarized with Sphere Standards in disaster response

Unit 3.1

Name:	**Physical, social, psychological and economic impacts of natural hazards**
Learning Objective:	-To know various physical, social, psychological and economic impacts of different types of hazards in the Province.
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Laptop with the multimedia, cards, flip charts, permanent markers, white board and erasable markers
Training Techniques:	PPT slides, interactive discussion, learning from local experiences followed with the Q/A at the end of the session

1. Introduction – Impacts of Natural Hazards

Throughout the course of human history, the effects of natural disasters have left serious impacts on human lives, physical infrastructure and environments. Besides, physical setbacks natural disasters can also significantly impact people emotionally, socially and even religiously. It takes a long time for people to rebuild their lives and requires huge investments to recover from physical losses, especially in the absence of social safety nets. Though, the communities can recover from physical and economic setbacks, at times it becomes difficult to recover from psychological damages. Moreover, the intensified socio-economic vulnerabilities in the aftermath of major catastrophes adversely influence physical, social and emotion wellbeing of individuals and communities. Some of the impacts have been mentioned below;

1.1. Physical Impact

The physical impact of natural hazards include deaths, injuries, permanent disabilities, traumatize situation for individual or at family level while damage to their houses, property, and economic activities are also part of the physical damages. Besides damages to education, health, safe drinking water, shelter, sanitation, roads and other critical facilities are all types of physical damages that can be caused by the natural hazards. The physical impacts on human health are discussed in detail in unit 6.3.

1.2. Social Impact

Loss of houses, livelihoods sources and community assets force people to migrate or relocate. For those already poor the prospects of migrating and relocating to a new place are full of uncertain future, weak communal and family bonds, exploitation, dilapidated standards of living, physical insecurity, alienation, unemployment and hostility from host community. These conditions can force people to opt for survival strategies which can further enhance their physical and socio-economic vulnerability. Moreover, increase population pressure of migration on already strained basic public services like schools, hospitals, water and sanitation in host communities may raise diverse social issues. Besides, many studies also indicate an increase in gender based violence, domestic violence, sexual exploitation of minor and drinking in post disaster periods.

1.3. Economic Impact

Economic setback from individual to global level is one the most apparent impact. Hazards can directly impact individual and household economies by destroying sources of livelihood, assets and draining their savings to recovering from negative impacts. At individual and family level the economic impacts include loss of bread earner in family, loss of business/ livelihood source, shifting to other less profitable sources of livelihoods or migration to other areas to seek income generation opportunities. People can sometimes also lose control over their means of earning sources including land, livestock, farming inputs due to migration to other areas. The confluence of these individual and household economic impacts result in price hikes, increase in the cost of living and overall inflation, further pushing the affected communities into poverty.

1.4. Psychological Impact

Physical, social and economic adverse impacts of disasters occasionally result in uncertain future and a constant state of insecurity these factors can combine to put a great deal of stress on individuals' families and communities. These conditions as result of disaster created prolonged stress can break down people emotionally and mentally, leading to various mental health problems. These problems manifest themselves in shape of (1) physically in form of fatigue, headache, back pains (2) emotionally as fear, depressions, anxiety, and mood changes or through (3) major changes in behavior e.g. domestic violence, GBV, alcohol abuse.

Further Reading and References

- *Psychological Impact of Natural Disasters, Department of Psychology, University of Houston, USA; 2017 available at https://www.uh.edu/class/news/archive/2017/august-september/natural-disasters-impact-adults/*
- *The Johns Hopkins and Red Cross Red Crescent Public Health Guide in Emergencies-Second Edition 2008*
- *Natural Disasters: Protecting the Public's Health Pan American Health Organization*

Unit 3.2

Name:	**Vulnerable segments within communities (Women, children, elderly, people with disabilities and marginalized groups)**
Learning Objective:	-To learn specific needs of women, children, elderly, disabled and marginalized group within community, created by hazardous situation -To know the importance of vulnerable people and groups inclusive disaster risk reduction process
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Laptop with the multimedia, meta cards, flip charts, permanent markers, white board and erasable markers
Training Techniques:	PPT slides, interactive discussion, learning from local experiences followed with the Q/A at the end of the session

1. Introduction

Adverse events (hazards) do not discriminate or distinguish on the basis of genders, socio-economic status, race or culture, but we human beings do. Therefore, disasters are experienced differently by men, women, girls, boys, and rich and poor. The social, cultural, economic, and religious ideologies of people create patterns of authority, prejudice, discrimination, and even exploitation in a society/ community. As a result of these deeply entrenched cultural and socio-economic behavior patterns certain groups of people are likely to suffer more than others before, during and after disasters. These patterns are also the reason, as to why men, women, rich and poor all have different coping mechanisms for response to crises situation, diverse abilities and level of resilience. The most prevalent negative social pattern which require attention during disaster risk reduction planning and responding to communities are gender inequalities and power imbalances in a community.

2. Differential Vulnerabilities and Capacities

Factors like gender inequalities and power imbalances in a society manifest themselves in shape of differential vulnerabilities and limited capacities resulting in increased impacts on women, children, elderly and poor. A 2007 study conducted by London School of Economic from a sample of up to 141 countries over the period 1981 to 2002 shows that, natural disasters and their subsequent impact, on average, kill more women than men or kill women at an earlier age than men related to women's lower socio-economic status. Many other studies also point out that women from same socio-economic status are affected more significantly as compared to men in a society during and after disasters. Poverty and vulnerability are interconnected, poor are more likely to live and work in areas exposed to potential hazards due to lack of material and financial resources and are also less likely to have the capacities and resources to cope when a disaster strikes.

3. Inclusive Disaster Risk Reduction Process at Community Level

Providing information to disaster-affected populations about their right to assistance and the means of accessing this assistance is very essential. The provision of such information to vulnerable groups is particularly important as they may be less able to cope and recover than others when faced with loss of their assets, and may need relatively more support. For these reasons, it is essential to recognize specific vulnerable groups, to understand how they are affected in different disaster contexts, and to formulate response accordingly, especially one working at community level. Special care must be taken to protect and provide for all affected groups in a non-discriminatory manner and according to their specific needs. Below are some of the key factors that put women, children, elderly, people with special needs and marginalized groups among the most vulnerable segments;

3.1. People with Disabilities as Vulnerable Group

People with disabilities include individuals who require physical and emotional assistance for incapacities that may be medical, mental, or psychological. Their inclusion in DRR is of extreme importance as they need special care while planning and mitigating the disasters. Disregarding the capacities of persons with disabilities increases their vulnerability. Their restricted mobility or capacity to anticipate and react/be evacuated puts them at higher risk of getting injured, trapped, stuck etc. They are also at higher risk of emotional distress and trauma caused by crisis situation. They are not fully involved while planning for DRR at community level mainly due to the following reasons:

- A culture of little or non-adapted involvement of persons with disabilities in DRR practices and in development at large.
- Restricted participation in community as a whole and in DRR practices due to miss-conception that people with disabilities are less informed, less prepared, etc. to the event of a disaster.
- They face being identified solely as passive victims, their capacities overlooked and their right to participate in decision making ignored. General perception that they cannot be involved

3.2. Women as Vulnerable Group

Women are another vulnerable group that can suffer from the disaster risks due to a number of contributing factors. Due certain cultural, social and religious norms prevailing in various parts of world and even in our country they are not engaged in the decision-making strategies and as a result they remain unaware of the potential strategies to adopt during disasters and get affected at larger rates. Moreover, their domestic activities are more likely to be time taking and they cannot participate in the risk reduction strategies and awareness programmes. In addition, in some of remote areas, they are bound under social restrictions that limit their social interactions, mobility and participation as local or national individual. These gender-based inequalities aggravate their vulnerability towards disasters.

3.3. Elderly as Vulnerable Group

With Age people get more fragile and vulnerable physically. Elderly people are frailer and less mobile; they are more likely to suffer from long-term health problems such as heart or respiratory illness, and from physical disabilities such as poor eyesight and hearing. These characteristics reduce older people’s capacity to take action before and during disasters. They may not, for example, be able to keep their houses properly maintained and hence more secure against hazards, or they may be unable to escape quickly enough to higher ground or shelters when floods or hurricanes threaten. They are more vulnerable physiologically to extremely hot or cold weather. Their chronic health conditions are more likely to worsen during and after an emergency due to poor temporary living conditions and disruption to regular health care.

3.4. Children as Vulnerable Group

Children also come under the category of vulnerable groups. They are dependents mostly on their mothers especially those under five are particularly vulnerable. In developing countries, children normally start holding responsibilities at very young ages that limits them from gaining education and getting time out for awareness programmes. Poverty, malnourishment and physical labor impact their health more than adults and can reduce their resiliency towards disasters in the form of inability to respond to and mitigate its effects.

4. Conclusion

The disasters disproportionately affect vulnerable/marginalized people and groups in the community. Vulnerable/marginalized people and groups include people with disabilities, women, elderly, children, transgender. This is not complete list and depending on location and community it could include more Individuals and groups. Their vulnerabilities can arise from various diverse reasons religion, caste, social class, belief, seclusion, profession, health status, physical deformity, stigma, reduced income earning opportunities and restricted access to public services etc. Failure to recognize the different needs of vulnerable groups and the barriers they face in gaining equal access to appropriate services and support can result in their further marginalization or even being denied lifesaving vital assistance. It has been commonly seen that DRR inclusive concept is more common at UN and I/NGOs level in Pakistan where these organizations support local communities or district administration in integrating DRR inclusive approach in their local development planning and implementation, while at the Government organization level, there is a lack of awareness about the inclusion concepts and hence need a lot of efforts to promote for the DRR inclusive approach in all development planning.

Further Reading and References

- *Emma Lovell and Virginie le Masson. Equity and inclusion in disaster risk reduction: building resilience for all. Overseas Development Institute (ODI) and Climate and Development Knowledge Network (CDKN), November 2014 (https://cdkn.org/wp-content/uploads/2014/11/CDKN-Equity-and-inclusion-in-disaster-risk-reduction-building-resilience-for-all1.pdf, accessed 12 September 2019), p. 3.*
- *A practical guide to Gender-sensitive Approaches for Disaster Management. Geneva, International Federation of Red Cross and Red Crescent Societies (IFRC), 2010*

Unit 3.3

Name:	**Health impacts of natural hazards and concept of Triage systems in mass casualty incident management**
Learning Objective:	-To know direct and indirect physical and psychological adverse impacts of various hazard on human health and wellbeing -To get familiarized with a basic of Casualty Incident (MCI) and Incident Command System (ICS) concepts -To know commonly used triage system in disasters and understand victim classification levels used in triage
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multi Media, Cards, Flip Charts, Markers, White board and Markers
Training Techniques:	Group Work, Group Presentation, Interactive Discussion

1. Introduction

One of the foremost "elements at risk" which can be adversely impacted by hazards is human health and wellbeing. Various hazards have the ability to impact human health in their own way and there is always a direct relationship between the type of disaster and its effect on human health. For example, earthquakes have the potential to cause sudden and considerable trauma injuries requiring urgent medical care and fatalities, while the effects of drought on human health such as malnutrition and other diseases often develop slowly over a period of time and the effects may linger for years even after the end of the event.

A hazard may have the ability to impact human health directly i.e. death and injuries (mortality and morbidity), but some of its effects can also be potential, rather than direct and immediate. For instance, contamination of underground drinking water sources by flood water may lead to increased risk of various water borne disease transmission. Although, epidemics generally do not result from natural disasters but disasters can create conditions favorable for spread of infectious diseases. The direct and potential health risks after a disaster occurrence do not happen at the same time. Therefore, casualties that require immediate medical attention may occur at the time and place of impact, while the risk of increased disease transmission can take longer to develop. This increased disease transmission risk increases with over-crowding in shelter camps, food and water shortages, malnutrition, extreme weather and with low standards of sanitation in communities affected by disasters.

2. Immediate Emergency Health Problems

A few examples of direct emergency health impacts of various hazards are described in table below:

Table 5: Direct Emergency Health Impacts of Various Hazards

Immediate Health Effects	Hazards				
	Earthquake	Floods	Drought	Cyclone	Heat wave
Deaths	High	Low	Low	Low	Medium
Severe Injuries requiring urgent medical care	Very High	Low	Very Low	Low	High
Disabilities	High	Low	Low	Low	Low
Increase Risk of Communicable Diseases	In case of Displacement	High	High	High	Medium
Damage to Health Facilities	Very High	High	Nil	Medium	Very Low
Food Shortages/ Malnutrition	Temporary	Temporary	High	Temporary	Nil

3. Risk of Disease Transmission During and After Disasters

Each type of hazard has its own peculiar way of causing damage to human health and wellbeing. Besides, mortality and morbidity as result of direct impact, risk of transmission of communicable/ infectious diseases is always present in any disaster situation. However, it has to be kept in mind that hazards do not usually directly result in outbreak of epidemics and infectious disease, but they can create favorable conditions for disease transmission. Many types of communicable/infectious diseases i.e. cholera, dysentery, typhoid, acute Upper Respiratory Tract Infections, pneumonia, viral hepatitis, malaria and worm infestation etc., can spread due to conditions created by the effects of disasters. The under mentioned conditions, common to all types of disaster situations increase the risks of disease transmission during and after disasters.

3.1. Food and Water Contamination

The risk of epidemic outbreaks of communicable diseases is proportional to population density and number of displaced populations. As higher population densities and large number of displaced people increase the pressure on local water and food supplies. While at same time, the risk of food and water contamination is also high due to disrupted sanitation services i.e. piped water and sewage. The most commonly observed disease incidence in Sindh province are caused by fecal contamination of water and food which usually occurs after riverine floods in summers.

3.2. Failure to Maintain Normal Hygiene and Sanitation

The above factors coupled with failure to maintain normal hygiene and sanitation standards can inevitably result in outbreak of diseases in the immediate post disaster period.

3.3. Increase in Vector-borne Diseases

Moreover, increase in vector-borne diseases also occurs in some areas because of disruption of vector control efforts, particularly following heavy rains and floods e.g. malaria incidents are very high following floods due to increase in mosquito breeding sites. In addition, people living in shelters with or near their domesticated cattle / animals are at a higher risk of zoonotic infections.

3.4. Malnutrition

In protracted crises, like extended drought situations, malnutrition as a result of lack of proper food and water can cause catastrophic outbreaks of various diseases. In 2014, due to persistent low rain fall drought like situation in Tharparkar resulted in acute malnutrition rates in children as high as 20% which is well above the emergency threshold of 15%. According to WFP Report, in Tharparkar the total number of under 5 years' children deaths was reported at 234 in 2013, 326 in 2014, and 398 in 2015, rising from 173 in 2011 and 188

in 2012. Temporary food and water shortage can also occur after the earthquake, cyclone and floods.

Factors

3.5. Extreme Climatic Exposure

The health hazards of exposure to various physical elements like cold weather, rains, heat and winds can also be catastrophic, especially for young children. In the post 2005 earthquake periods the incidents of Acute Respiratory Infection –ARI and Pneumonia were extremely high in younger displaced population due to cold climate. Similarly, in the IDP camps established in Peshawar after the 2009 internal displacement of 2.3 million people from Malakand region of Khyber Pakhtunkhwa province, large numbers of skin diseases/ infections were reported as a direct result of warmer climate of Peshawar.

3.6. Damage to the Health Facilities, Water supply and Sewage Systems

Health facilities and other public infrastructure can be seriously impacted by disasters. Floods, earthquake, cyclone and tsunami all have potentials to cause serious damage to health facilities and water supply/ sewage systems in a community. These facilities have direct impact on the health of the population in catchment areas being dependent on these services. The destruction of hospitals and health centers due to disasters seriously limits the capacity to provide curative and preventive health services to disaster victims.

4. Mental and Emotional Impacts of Exposure to Hazards

The adverse impacts of hazards are not just limited to body only; their damaging affect can also impact mental and psychological wellbeing of people and communities. There is no universally accepted definition of mental health. However, mental health is about normal as well as abnormal reaction of people to a given situation. Mental health problems usually occur under stress from negative factors, pressures, illness or death especially in the family, lack of income, or exposure to any negative social or environmental factor which lasts for a long period of time.

During disasters and in post disaster situations sometimes people's entire way of life is torn apart. Their living conditions may become intolerable; they might loss family members, their livelihood, their savings and assets or lifelong disability. These conditions, along with an uncertain future and a constant state of insecurity can sometimes put a great deal of stress on families and communities. These conditions as result of disaster created prolonged stress which can break down people emotionally and mentally, leading to various mental health problems. These problems manifest themselves (1) physically in form of fatigue, headache, back pains (2) emotionally as fear, depressions, anxiety, and mood changes or through (3) major changes in behavior e.g. domestic violence, GBV, alcohol abuse. Most of

these problems can be treated if identified early; however, if not dealt with in timely manner people can continue suffering even after the emergency situation is over.

5. Mass Casualty Incident Management

The following part of the session briefly familiarizes participants on basic of Casualty Incident (MCI) and Incident Command System (ICS) concept, while elaborating in details the triage system, as one of the component of MCI at community level. A Mass Casualty Incident (MCI) can be described as an event where the needs of a large number of victims overwhelm and disrupt the normal operating capabilities of the local health service. MCIs range from a few patients injured in a road accident that can overwhelm the capacity of local hospital to a mega emergency where hundreds of victims disrupt the entire health system of the affected area.

The local resources, transportation, accessibility and physical environments are often disrupted during the time of emergency and in post disaster situations. These conditions put a huge strain on local emergency medical services and responders in immediately responding and attending to the needs of the affected population (victims). Therefore, an efficient MCI management system is required to be put in place. The pre-establishment of basic guidelines and principles of an Incident Command System (ICS), triage and patient flows according to the hospital's plan can save many lives and much needed precious resources.

6. Importance of Community Participation in MCI Management

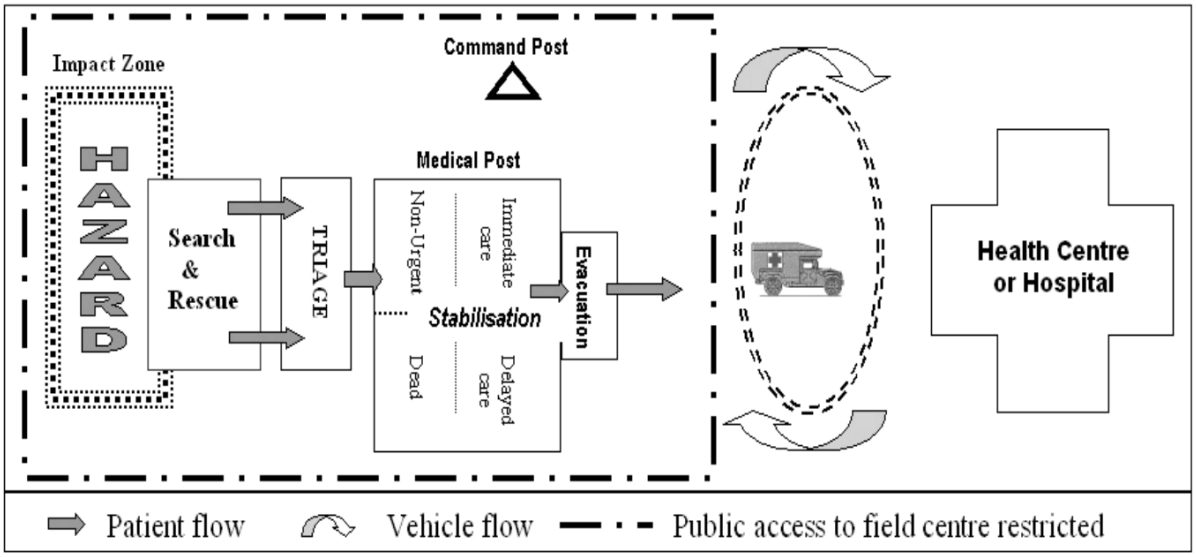
The importance of community participation in emergency response cannot be ignored. Evidence shows that community participation before, during, and after a disaster can greatly reduce the overall mortality as well as improve the use of resources. The state of community preparedness before a disaster can influence the outcome in case disaster strikes by reducing the number of injuries and deaths, damage to infrastructure, loss of property and livelihood sources. While working in community setting It has to be kept in mind that, the greatest number of lives can be saved during the first few hours following a disaster before help from the outside arrives which can take several hours or days, known as Golden Hour Principle in Emergency Response. The local community must, therefore, be ready to assist since they may only have themselves to rely on. Most public and emergency health problems can be handled by the community. However, it is possible if the community is active, trained, prepared and sufficiently organized to sustain itself until outside help arrives.

6.1. Basic Mass Casualty Incident (MCI) Management

The Basic MCI management is a series of steps that together can meet the immediate health needs of disaster victims. The process begins with a search and rescue at the disaster site and usually ends with shifting and referral of victims to nearest health facility or discharged for home care. Led by an Incident Commander during a mass casualty management, various

teams operate to rescue and remove all wounded and dead (victims) from the disaster site and prioritize the shifting and subsequent transport of only the critical victims to nearest health facility. The triage team, under the leadership of a Triage Officer, prioritizes -tags, if possible- treats and releases victims from their medical post according to their health conditions. The type of care given is limited to first aid and emergency medical care. Under limited resource conditions, such as staff shortages, the small emergency health team might be required to rotate within the medical post in order to attend all victims. The goal of a mass casualty incident management system is to minimize the loss of life or disability among disaster victims by first meeting the needs of those most likely to benefit from services.

Figure 10: Basic Mass Casualty Incident (MCI) Management Flow Chart:



Public Health Guide in Emergencies, John Hopkins and Red Cross and Red Crescent 2008

6.2. Triage -START (Simple Triage and Rapid Treatment)

The triage term comes from the French verb trier, meaning to separate, sort, sift or select. Modern medical triage was invented by Dr. Dominique Jean Larrey, as a surgeon during the Napoleonic Wars, who treated the war wounded according to the observed gravity of their injuries. We have learned that in an emergency there are shortages of personnel, supplies and transportation vehicles and the medical responder battle against time to save as many victims as possible. Therefore, in emergency medical response, triage means sorting and prioritizing victims for medical attention according to the degree of injury or illness and their expectations for survival. The goal of triage is to identify critical injuries requiring life-saving intervention in the shortest possible time by providing on spot care to victims with minor or localized injuries so that the health facilities are able to attend to critical victims. Triage saves time and tremendously reduces the burden on health facilities. The term is also referred to as *START (Simple Triage and Rapid Treatment)*.

6.3. Commonly Used Triage System and Levels

The commonly used triage system is the classification of the victims/patient's medical condition into four levels i.e. immediate medical care, delayed care, non-urgent or minor; and dead or near dead. The triage system to prioritize patients and victims is used in many settings i.e. in emergency departments, hospital and in emergency rooms and worldwide various triage systems exists, with different names. However, the triage system utilized in disaster and emergency setting is known as MCI Triage or Disaster Triage and in this system the basic categories of victims and color coding remains uniform universally. The table given below describes in detail the various victim categories and terminologies used in MCI / Disaster Triage.

Table 6: - MCI Triage Categories

Category	Color - Tag	Condition	Remarks
Minor	Green	**Wait**-Relatively minor injuries	• Status unlikely to deteriorate over days "walking wounded" • Minor treatment/First aid given on spot
Delayed	Yellow	**Delayed/ Observation-** Includes serious and potentially life-threatening injuries	• Condition and status not expected to deteriorate significantly over several hours • Transport can be delayed.
Immediate	Red	**Immediate -** Requires urgent medical attention within minutes for survival (up to 60 minutes)	• Includes patient's with compromised airway, breathing and circulation. • Condition can deteriorate if not treated urgently
Expectant	Black	**Expectant-** Unlikely to survive given severity of injuries and level of medical care available or dead	• Palliative care and pain relief should be provided

Further Reading and References

The Johns Hopkins and Red Cross Red Crescent Public Health Guide in Emergencies- Second Edition 2008

Natural Disasters: Protecting the Public's Health Pan American Health Organization

Unit 3.4

Name:	**Introduction to Sphere Standards**
Learning Objective:	-To learn about Sphere Project- Humanitarian Charter and Minimum Standards in Disaster Response -To get familiarized with the contents and layout of Sphere hand book -To know the importance of application of Sphere minimum standards and indicators in emergency humanitarian context
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multi Media, Cards, Flip Charts, Markers, White board and Markers
Training Techniques:	Group Work, Group Presentation, Interactive Discussion

1. Introduction to Sphere Project

The initiative was launched in 1997 by a group of humanitarian NGOs and the Red Cross and Red Crescent movement, who framed a Humanitarian Charter and identified Minimum Standards to be attained in disaster assistance, in each of four key sectors i.e. water supply and sanitation, nutrition, food aid, shelter and health services. The Humanitarian Charter and Minimum Standards are builds upon the 1994 Code of Conduct for the International Red Cross and Red Crescent Movement and Non-Governmental Organisations (NGOs) in Disaster Relief. This Code of Conduct still remains an integral component of The Sphere Handbook.

The cornerstone of the handbook is the Humanitarian Charter, which is based on the principles and provisions of international humanitarian law, international human rights law, refugee law and the Code of Conduct for the International Red Cross and Red Crescent Movement and Non-Governmental Organisations (NGOs) in Disaster Relief. The Charter describes the core principles that govern humanitarian action and reasserts the right of populations affected by disaster, whether natural or man-made (including armed conflict), to protection and assistance. It also reasserts the right of disaster affected populations to life with dignity.

1.1. Humanitarian Charter -Part 1

The Charter describes the core principles that govern humanitarian actions and asserts the right of populations to the protection and assistance. The Charter defines the legal responsibilities of states and parties to guarantee the right to assistance and protection. For the purposes of understanding this Charter, the rights can be summarized as, the right to life with dignity; the right to receive humanitarian assistance; and the right to protection and security. Moreover, when states are unable to respond, they are obliged to allow the intervention of humanitarian organisations. The Humanitarian Charter is based on following fundamental principles.

- The Right to Life with Dignity- This right is reflected in the legal measures concerning the right to life, to an adequate standard of living and to freedom from cruel, inhuman or degrading treatment or punishment. We understand an individual's right to life to entail the right to have steps taken to preserve life where it is threatened, and a corresponding duty on others to take such steps. In addition, international humanitarian law makes specific provision for assistance to civilian populations during conflict, obliging states and other parties to agree to the provision of humanitarian and impartial assistance when the civilian population lacks essential supplies.
- The Distinction Between Combatants and Non-combatants- Internal conflict is often referred to as 'civil war', it must not blind us to the need to distinguish between those actively engaged in hostilities, and civilians and others (including the sick, wounded and prisoners) who play no direct part. Non-combatants are protected under international humanitarian law and are entitled to immunity from attack.
- The Principle of Non-*refoulement* - This is the principle that no refugee shall be sent (back) to a country in which his or her life or freedom would be threatened on account of race, religion, nationality, membership of a particular social group or

political opinion; or where there are substantial grounds for believing that s/he would be in danger of being subjected to torture

- Roles and Responsibility – Generally, it is firstly through own and local efforts that the basic needs of people affected by calamity or armed conflict are met, and we acknowledge the primary role and responsibility of the state to provide assistance when people's capacity to cope has been exceeded.
- Protection and Assistance - International law recognizes that those affected are entitled to protection and assistance. It defines legal obligations on states or warring parties to provide such assistance or to allow it to be provided, as well as to prevent and refrain from behavior that violates fundamental human rights stated in international human rights law, international humanitarian law and refugee law

1.2. Minimum Standards - Part 2

The Minimum Standards were developed using broad networks of experts in each of the five sectors. They describe minimum standards to be attained in disaster assistance, in each of five key sectors i.e. water supply and sanitation, nutrition, food aid, shelter and health services.

2. Sphere Hand Book

Combined together The Humanitarian Charter and Minimum Standards put these core beliefs into practice. The Protection Principles inform all humanitarian action, and the Core Humanitarian Standard contains commitments to support accountability across all sectors. The Humanitarian Charter and the Minimum Standards contribute to an operational framework for accountability in disaster assistance efforts in the form The Sphere Handbook, which has developed into one of the most widely referenced humanitarian resources globally. The first publication of the first Sphere handbook was in 2000.

2.1. When to Use the Handbook

The Sphere handbook is designed for use in disaster response, and may also be useful in disaster preparedness and humanitarian advocacy. It is applicable in a range of situations where relief is required, including natural disasters as well as armed conflict. It is designed to be used in both slow- and rapid-onset situations, in both rural and urban environments, in developing and developed countries, anywhere in the world. The emphasis throughout is on meeting the urgent survival needs of people affected by disaster, while asserting their basic human right to life with dignity.

2.2. Time Frame

The timeframe in which the handbook is used depends largely on the context. It may take days, weeks or even months before agencies are able to achieve the Minimum Standards and indicators specified in a particular sector. In some situations, the Minimum Standards may be achieved without the need for external intervention. A timeframe for implementation

needs to be agreed in any given situation. Where relevant, guidance notes suggest realistic timescales for the implementation of the standards and indicators.

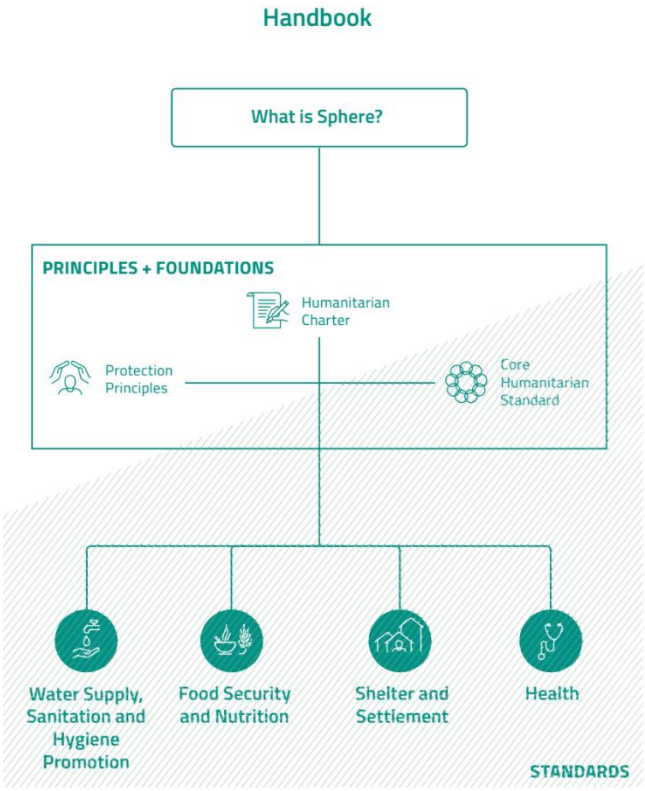
2.3. How to use Handbook

It has to kept in mind that this book is not a 'how to' manual. Instead, it offers a set of Minimum Standards and key indicators that inform different aspects of humanitarian action, from initial assessment through to coordination and advocacy.

2.4. Standards and Indicators

The standards are general statements that define the minimum level to be attained in a given context; the indicators act as 'signals' that determine whether or not a standard has been attained; while the guidance notes provide additional information. Each of the four technical chapters – water supply, sanitation and hygiene promotion; food security, nutrition and food aid; shelter, settlement and non-food items; and health services has its own set of standards and indicators. The guidance notes in each chapter relate to specific points that should be considered when applying the standards in different situations. The key indicators, as measures to the standards, can be qualitative or quantitative in nature. They function as tools to measure the impact of processes used and programmes implemented. Without them, the standards would be little more than statements of good intent, difficult to put into practice.

3. Contents of the Hand Book



Each chapter includes its own minimum standards, key indicators and guidance notes

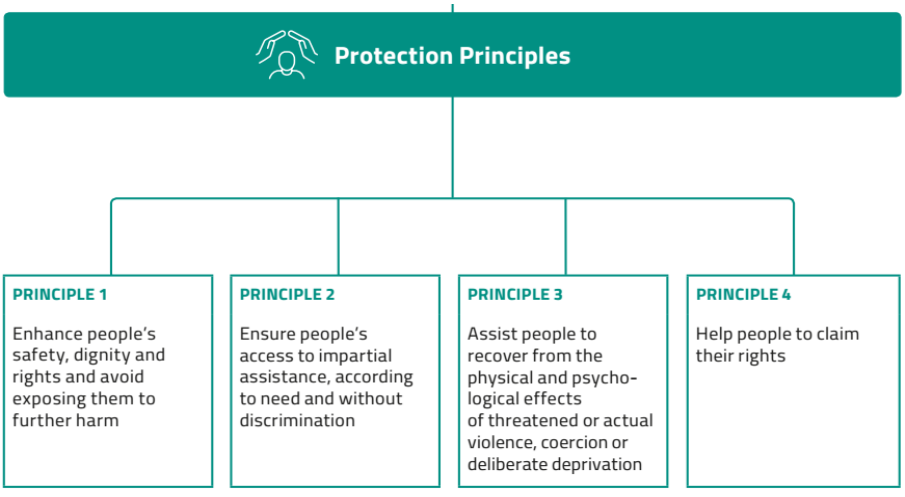
3.1. Core Humanitarian Standard on Quality and Accountability (CHS)

The Core Humanitarian Standard on Quality and Accountability (CHS) sets out nine Commitments that organisations and individuals involved in humanitarian response can use to improve the quality and effectiveness of the assistance they provide. It also facilitates greater accountability to communities and people affected by crisis, staff, donors, governments and other stakeholders. Knowing what humanitarian organisations have committed to will enable them to hold those organisations to account. It is a voluntary framework for both individuals and organisations. The Standard applies both at the response and programme levels and in all phases of a response. However, the nine Commitments are not intended to correspond to any particular phase of the programme cycle. Some are more relevant to a certain phase of the cycle, while others, such as communication with affected people, are intended to apply throughout all phases.

Figure 11: The Core Humanitarian Standard on Quality and Accountability (CHS)

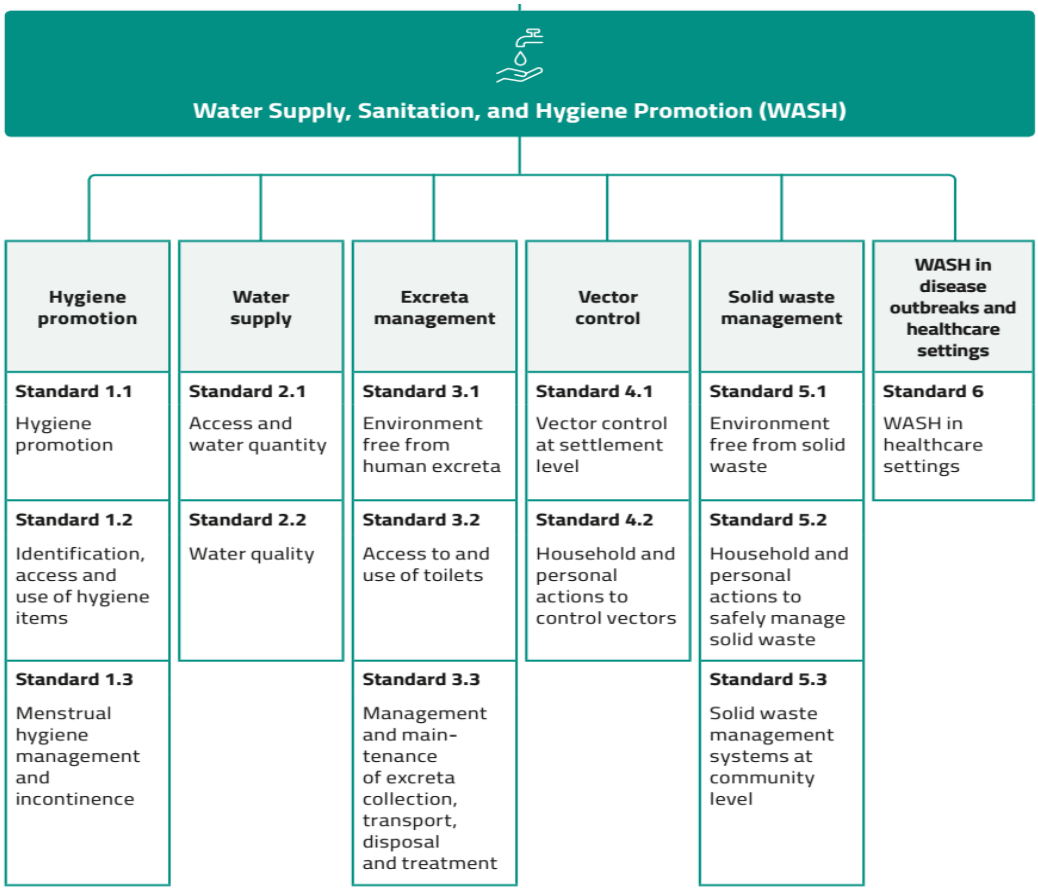
3.2. Protection Principles

This chapter provides guidance on how humanitarian organisations can contribute to protection by helping people stay safe, access assistance; recover from violence and claim their rights.



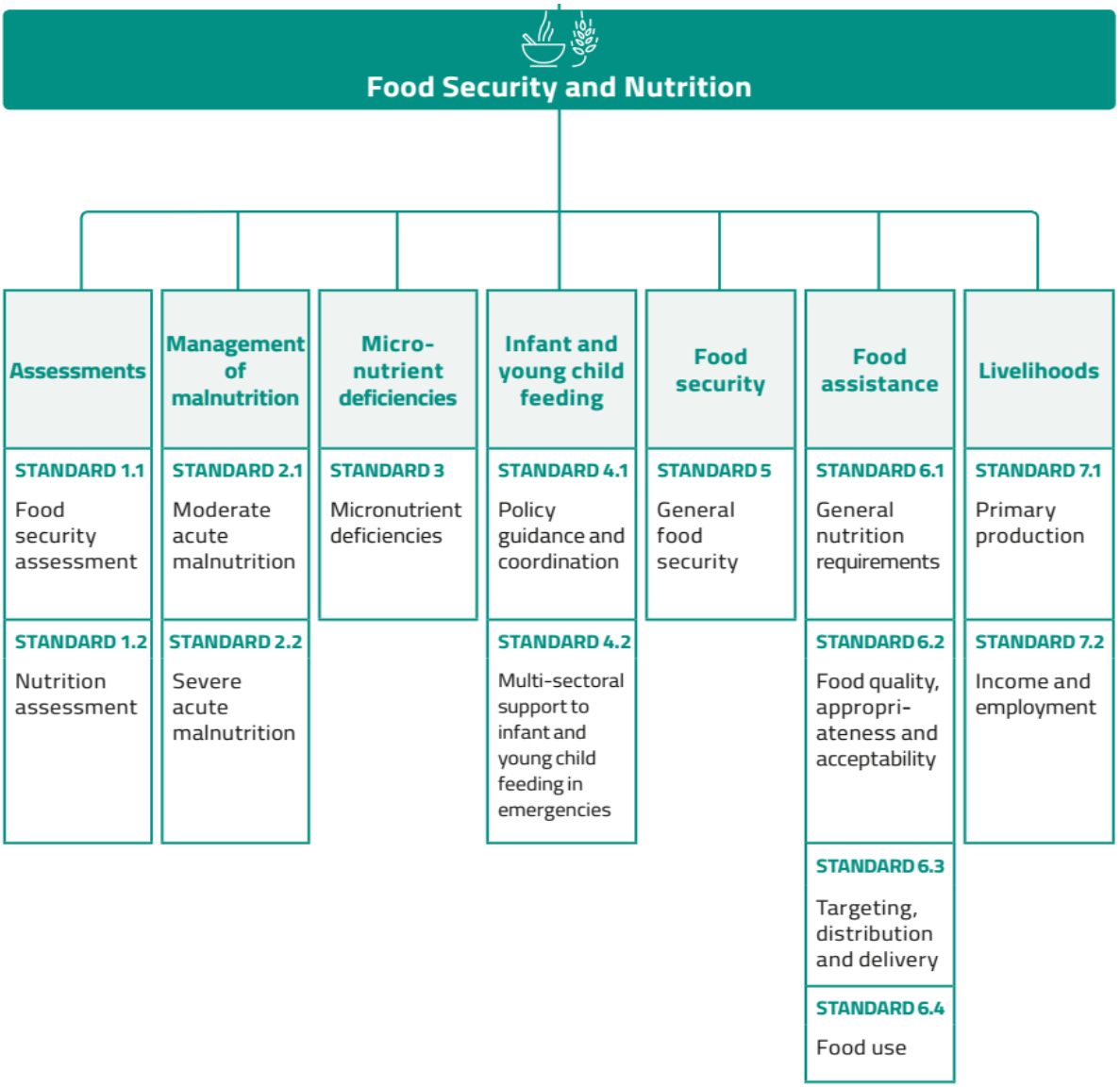
3.3. Minimum Standards in Water, Sanitation and Hygiene Promotion - WASH

This chapter deals with the standards and indictors on WASH. The main pathways for pathogens to infect humans are faeces, fluids, fingers, flies and food. The main objective of WASH programmes in humanitarian response is to reduce public health risks by creating barriers along those pathways.



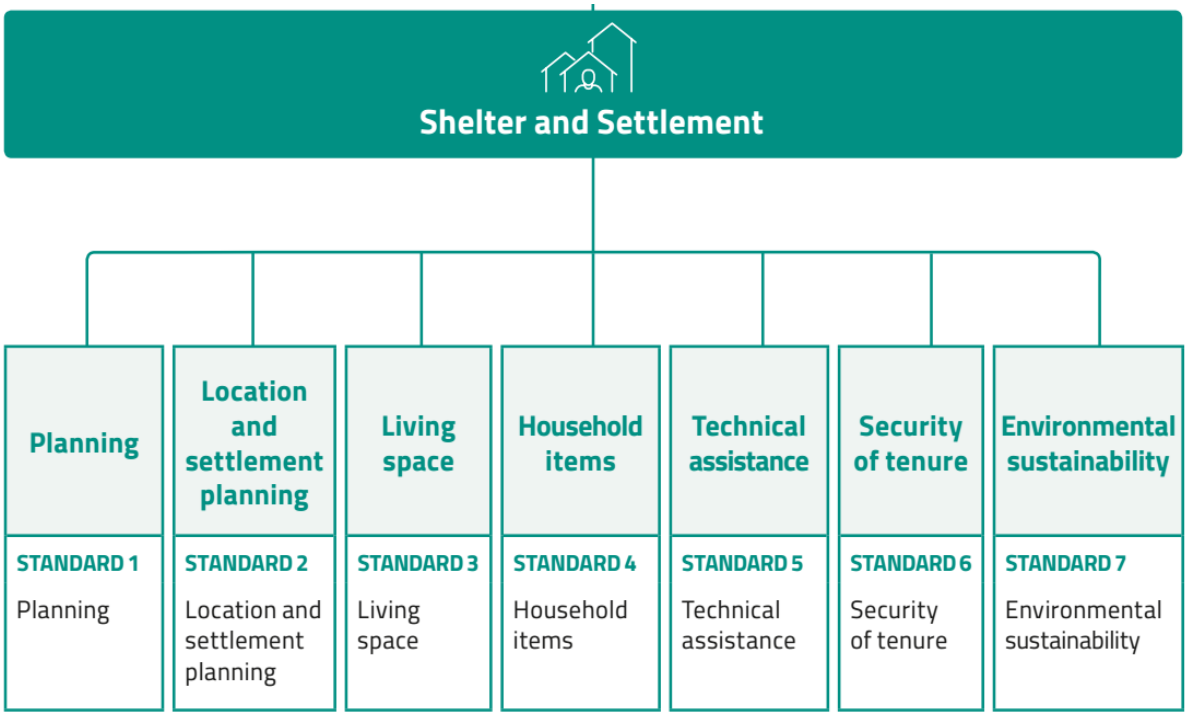
3.4. Minimum Standards in Food Security, Nutrition and Food Aid

Undernutrition reduces people's ability to recover after a crisis. It impairs cognitive functions, reduces immunity to disease, increases susceptibility to chronic illness, limits livelihoods opportunities and reduces the ability to engage within the community. It undermines resilience and may increase dependence on ongoing support. The Minimum Standards in this chapter reflect the core content of the right to adequate food his helps ensure that needs are met, that efforts are not duplicated and that the quality of food security and nutrition responses is optimised.

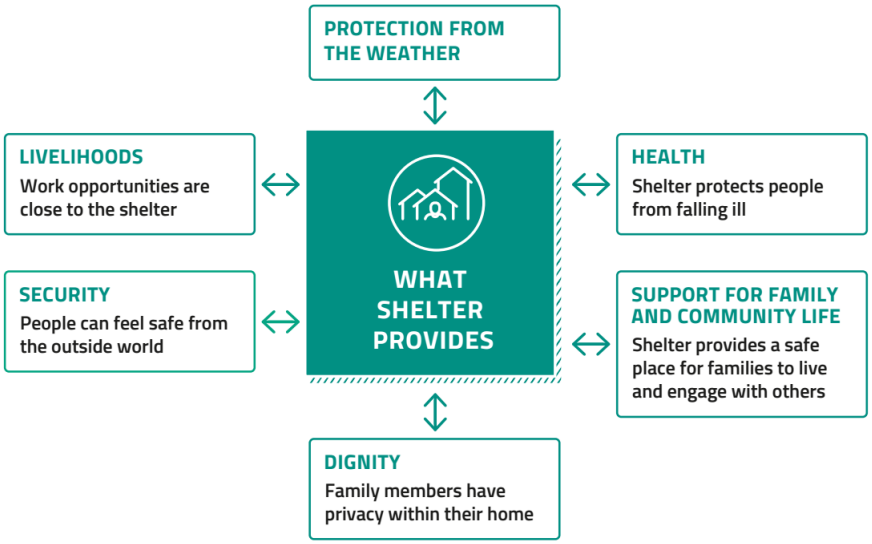


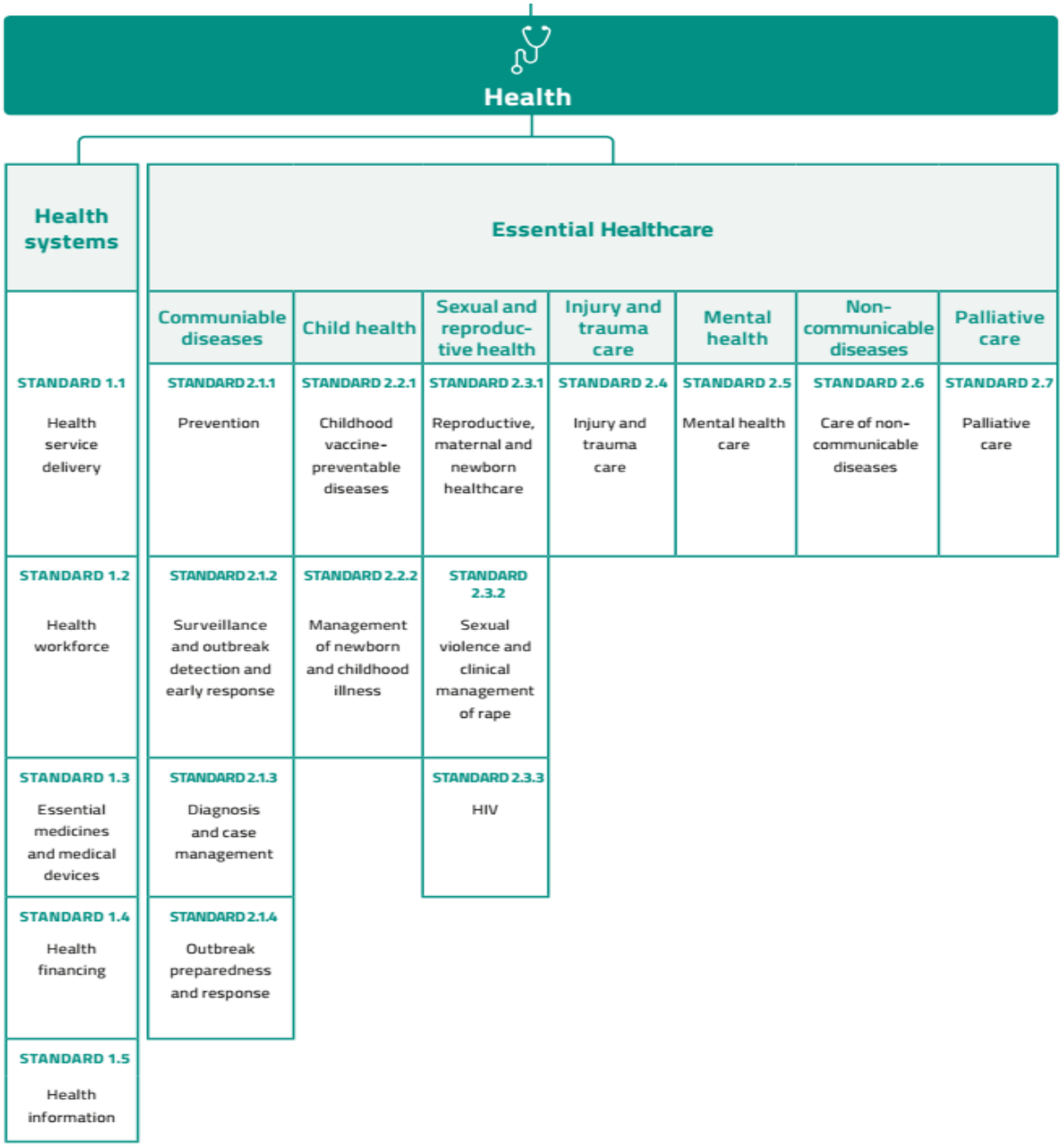
3.5. Minimum Standards in Shelter, Settlement

The Sphere Minimum Standards for Shelter and Settlement are a practical expression of the right to adequate housing in humanitarian contexts. Shelters and settlements are inter-related and need to be considered as a whole. “Shelter” is the household living space, including the items necessary to support daily activities. “Settlement” is the wider locations where people and community live.



Timely shelter and settlements support can save lives in the initial stages of a crisis. In addition to providing protection from weather, shelter is necessary to promote health, support family and community life, and provide dignity, security and access to livelihoods.





3.6. Minimum Standards in Health

The Sphere Minimum Standards for Healthcare express people right to healthcare in humanitarian contexts. The primary goal of a health response during a crisis is to prevent and reduce excess mortality and morbidity.

4. Summary

The Sphere Handbook contains a structured approach based on the principles and provisions stated in international humanitarian law, international human rights law, refugee law and the Code of Conduct for the International Red Cross and Red Crescent Movement. Sphere standards ensure accountability in humanitarian response and bring quality to the response by upholding the rights of disaster affected people. The core belief of Sphere, that all

people affected by disaster or conflict have a right to life with dignity and the right to receive humanitarian assistance is the cornerstone of this Handbook.

Technical standards outlined in four fundamental emergency response sectors i.e. water, sanitation and hygiene promotion, food security and nutrition, shelter and settlement and health are a practical expression of right to receive humanitarian assistance on the basis of need by all people irrespective of gender, age, disability, nationality, religious or political views and social status. While the quantitative and qualitative minimum standards lead the way of humanitarian actors by defining in detail what needs to be achieved while responding to crises. Key actions, indicators and guidance notes supplement these standards and make it easy for humanitarian organization to apply them in diverse context and in a variety of settings. Universality and adaptability in application, well suited to diverse humanitarian settings is the strength of Sphere standards. These attributes have earned Sphere broad ownership in the humanitarian sector. These standards have become a common emergency / humanitarian response language for achieving quality and ensuring accountability in humanitarian contexts.

Reference and Further Reading

The Sphere Handbook 2018 Edition

Module-4

Community Preparedness and Emergency Response Management at Community Level

Unit 4.1:	An overview to Emergency Response Management at various levels
Unit 4.2:	Importance of Emergency Response and community preparedness
Unit 4.3:	Establishing DRR Committees and ER Teams (Assigning Roles and Responsibilities)
Unit 4.4:	Hazard specific Community Based Early Warning Systems & Mechanism

Outcomes

Upon completion of this Module you will be able to:

- Understand Emergency Response Management and learn its importance at community level
- Familiarized with Emergency Response Management institutional framework and organizations at all levels in Pakistan
- Know various emergency response management activities undertaken at community level
- Learn priority action of PDMA Sindh for promoting emergency response management activities in, Province
- Know the need and importance of DRR planning at village and union council level.
- Understand the process of establishing DRR committees at community level and know their roles and responsibilities in disaster risk reduction and emergency response.
- Know the early warning systems in Pakistan and learn community level early warning system and mechanism for various hazards

Unit 4.1

Name:	**An overview to Emergency Response Management at Various Levels**
Learning Objective:	- To attain conceptual understanding of Emergency Response Management -To know the difference between disaster risk management and emergency response management - To get familiarized with Emergency Response Management institutional framework and organizations at all levels
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Plenary, interactive discussion, learning from local experiences, group work, group presentation, audio visual aids, and Q/A

1. Introduction

The terms “Disaster and Emergency” are very often used interchangeably, however there is a significant difference between them. Therefore, in order to develop a better understanding of term emergency response it is important to first differentiate the terms disaster and emergency from one another. We can describe term “Emergency” as an unforeseen event or incidence that can be successfully dealt with and responded by utilizing local available resources. In simple words an emergency is a sudden event necessitating response. While, a disaster is a critical event with much wider scope, it causes serious disruption of the functioning of a community or a society. Disasters unusually accompany widespread human, material, economic and environmental losses and their overwhelming impacts exceed the ability of the affected community or society to cope using its own resources, leading to need for assistance from outside of the locality.

2. Difference - Disaster Management and Emergency Management

Emergencies are localized and tend to occur more frequently and regularly than disasters and they can be anticipated by a community. The everyday emergency situations requiring response can be medical emergencies, vehicular accidents, domestic fires, and riots etc. Depending on the scale, typology and intensity of emergency event the response can be at individual level, community level, Union Council or at District level. At local level the emergency response services i.e. emergency medical service, fire department, police, and other public & private services can safeguard people, infrastructure and environment from ill effect of such events. An event which can adversely impact people, infrastructure and environment is declared as a “disaster” when there is a need for external assistance to cope with its impacts. For example, when a district government requests provincial support to cope with the adverse impacts of an event, the event becomes disaster at district level, however, it still remains an emergency at the provincial level. Similarly, in the case a national government declares a state of disaster or national calamity as a way to request international humanitarian assistance and the support of the international community to cope with the impacts of a disaster, it becomes a global emergency situation.

2.1. Characteristics of an Emergency

- Disruptive to individuals, communities infrastructure and environment
- Not part of day-to- day experience
- Unpredictable in occurrence and its effects
- Wide range of destructive effects and impacts on the humans, animal and/or plant life, health, property and/or the environment
- Local resources may prove to be inadequate
- Requires a response
- Complex needs in dealing with them
- Overwhelm normal prudent protective measures

3. Emergency Response

"Response is a reaction to any situation or event which can be categorized as an emergency". Response can from an individual to national level. The response phase of an emergency may or may not commence with search and rescue but in all cases the focus will quickly turn to fulfilling the basic lifesaving and humanitarian needs of the affected population. Effective coordination of disaster assistance is often crucial, particularly when many organizations respond and local emergency management agency's capacity has been exceeded by the demand or diminished by the disaster itself.

When any emergency or disaster affects a community, the foremost and initial efforts undertaken include search& rescue, care for injured/wounded, restoration of lifelines and basic services, damage need assessment and evacuation, commonly known as emergency or disaster response. After this initial phase of emergency response, the subsequently response activities consist of efforts to restore livelihoods and to reconstruct communities to bring back the life to normalcy. The emergency or disaster response can be divided into three phases:

- Emergency Response Phase. It includes activities such as search & rescue, rapid damage and needs assessments, provision of first aid, evacuation to temporary shelters for those left homeless and provision of humanitarian assistance (food, water, NFIs and health care to those affected)
- Rehabilitation Phase. During this phase basic services and lifelines are restored, like road network, bridges, airports, ports and other essential facilities necessary for restoration of normal life.
- Reconstruction Phase. This phase includes reconstruction efforts on the basis of assessment of damages and destruction of infrastructure. The priority is to reconstruct infrastructure most needed by communities and to restore the livelihoods of those affected.

Figure 12: Disaster Risk Management versus Emergency Response

4. Emergency Response Management

ER management includes a wide range of activities and measure which are deemed necessary to safeguard individuals, communities, infrastructure and environment. These measures can be undertaken at any level i.e. national, provincial, district, union council and even at community level. Nonetheless, at all levels, ER management encompasses putting in a system guided by respective policies and administrative decisions. Subsequently, ER planning is undertaken for better coordination of operational activities and for ensuring resource availability required for managing various stages of an emergency response.

"The aim of ERM is to reduce mortality and morbidity, damage to property and environment, thereby limiting the adverse impacts of event and to ensure speedy and successful recovery of maximum number of people".

5. Preparedness for Effective Response

Response Preparedness measures can take many forms including the construction of emergency shelters, installation of early warning devices and rehearsing evacuation plans. In the preparedness phase, emergency departments develop plans of action for when the disaster strikes. Common preparedness measures include:

- Preparation of Emergency Contingency and Response plans
- Prior coordination of Emergency Contingency and Response activities as stated in plan
- Proper maintenance of equipment and drills/ training of emergency services
- Installation of early warning devices, practice and drills on warning methods combined with emergency shelters and evacuation.
- Stockpiling response stores/ inventory, and pre- placement of disaster supplies and equipment

6. ER Management Institutional Framework at National & Provincial Levels

Institutional Framework

6.1. The West Pakistan National Calamities (Prevention and Relief) Act 1958

Pakistan National Calamities (Prevention and Relief) Act 1958 provides for the maintenance and restoration of order in areas affected by calamities, and relief against such calamities. The Calamities Act 1958 was mainly focused on organizing emergency response. This act was later amended when the four provinces were created in 1971. After the abolition of one unit in 1971, the provinces adopted the 1958 Calamities Act with some changes in content

as per their requirements. In province of the Punjab, a dedicated department with the name of "Relief and Crisis Management Department" was established in 1975. In other provinces, Senior Member Board of Revenue (SMBR) was designated Relief Commissioner ex-officio.

6.2. Emergency Relief Cell (ERC)

Emergency Relief Cell (ERC) was created within the Cabinet Division in 1971 and is responsible for disaster relief at national level. It provides assistance in cash and kind to supplement the resources of the Provincial Governments in event of major disaster. Additionally, it extends helping hand to the calamity stricken friendly countries as and when required. ERC coordinates activities of all the related agencies i.e. Federal divisions, Provincial Governments, semi-governmental, international and including national aid giving agencies during relief operation. It administers the Prime Minister's Flood Relief Fund and also maintains an Aviation Squadron with a fleet of helicopters to assist rescue operations and enable officials to visit the affected areas.

6.3. National Crisis Management Cell (NCMC)

NNMC was established in July 1999 under Anti-Terrorist Act in the Ministry of Interior. The main functions of the NCMC are to collect information regarding various emergencies in the country. To coordinate with Provincial Crisis Management Cell. To coordinate with other relevant agencies to collect relevant information and it is responsible for coordinating plans for emergency relief services in case of emergency situation.

6.4. National Disaster Management Act 2010

The 2005 earthquake tested the resilience and capacity of Pakistan and its people to overcome catastrophes. The need for strong institutional and policy arrangements was fulfilled by promulgation of the National Disaster Management Ordinance 2007. The ordinance provided legal and constitutional arrangements for disaster management at federal, provincial and district levels. The NDMO provided the National Disaster Management Commission (NDMC) as the apex body for managing disasters, with the National Disaster Management Authority (NDMA) as its administrative arm. The National Disaster Management Authority will deal with the 'entire spectrum of disaster management in the country. In December, 2010, the NDMO was converted into an Act of the Parliament as the National Disaster Management Act 2010, with retrospective effect from August 2007.

7. Emergency Response Organization at National, Provincial and District Levels

The state or government has the primary responsibility of safeguarding the lives, properties and livelihood of its citizen in case of disasters and crises. Therefore, it is Government's responsibility to develop, test, and refine emergency operations plans, ensure emergency responders have adequate skills and resources, and provide services to protect and assist its citizens. For details on roles and functions of various emergency response organizations

please refer to National Disaster Response Plan 2010. The Government Emergency Response Service providers include:

- Emergency Management Service – NDMA, PDMA, DDMU, NHEPRN, Civil Defense and Civil Administration
- Law Enforcement Service - Police, Rangers, Military
- Fire Fighting and Rescue - Fire Fighting Services/ Fire Brigade
- Emergency Medical Services – Hospitals and Ambulance Services
- Public Health Services – Hospitals and Health Departments
- Public Works- PHA and other public services departments
- Armed Forces- Army Aviation, Navy and Military Corps of Engineers
- Logistic Services- NLC
- Communication Services- SCO and PTCL

8. Declaration of an Emergency

The declaration of emergency depends upon the nature and size of the disaster. A national level emergency is declared by the Prime Minister of Pakistan. However, at lower tiers the normal practice is that the district level emergency is declared by the District Administration. In case the emergency is beyond the capacity of district management, or the calamity is in a number of districts the Chief Minister with the approval of his Cabinet declares Provincial level emergency. Another aspect from the point of relief and rehabilitation and compensation is declaration of an area as calamity affected. In policy there is no clear standard or criteria for declaring an area "Calamity Affected". However, as per the government practice, generally if there is more than 50% loss of livelihoods, the district and provincial authorities can declare an area as "Calamity Affected".

Table 7: Criteria for Declaring Emergency

	Hazard	Basic Criteria for Declaring Emergency	Supporting Factors
a.	Floods/Flash Floods	Minimum 50% losses of livelihoods e.g. standing crop damage, livestock loss, other small livelihoods sources	Political, civil society and media pressure
		Loss of human lives	
		Severe damage to infrastructure	
b.	Cyclone	Minimum 50% losses of livelihoods	Political, civil society and media pressure
		Destruction of boats, nets and other fishing accessories	
		Destruction of standing crops	
		Loss of livestock	
		Loss of human lives	
		Severe damage to infrastructure	
c.	Drought	Crop failure	Human and livestock migration, civil society and media pressure
		Livestock losses	
		Fodder crop failure	
		Loss of human lives	
d.	Earthquake	Loss of livelihoods	Political, civil society and media pressure
		Loss of human lives	
		Infrastructure damage	
e.	GLOF	Loss of livelihoods	Damage to infrastructure, communication etc, Political, civil society and media pressure
		Standing crops/Fruit crops	
		Loss of livestock	
		Loss of storage foods	
		Loss of Human lives	
f.	Avalanches	Loss of livelihoods	Loss of property, loss of human lives, damage to infrastructure, housing & communication etc, Political, civil society and media pressure
		Standing crop/Fruits crop	
		Loss of livestock	
		Loss of storage foods	
g.	Heavy winds/Storms	Loss of standing crops/fruit crops	Political, civil society and media pressure

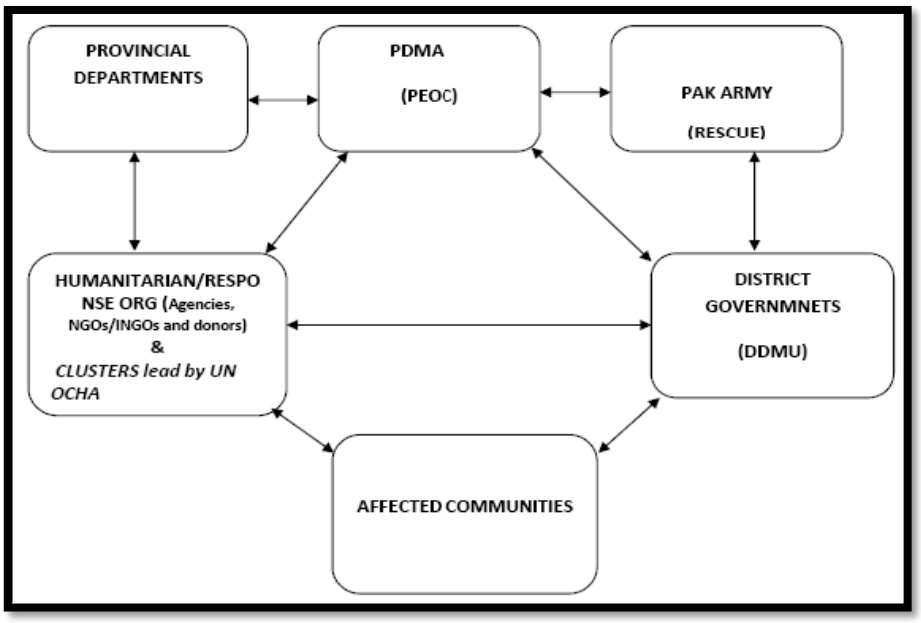
Source: National Disaster Response Plan

9. Levels of Emergency

- **Level-1:** The localized emergency situation to include small scale urban or industrial fires, road traffic/ train accidents, landslides, flood, building collapse, canal or sub canal breach, low level epidemics etc. Those events which can be dealt with by local resources and by DDMA / district administration. In this level the district is capable of handling the situation on its own. The Emergency level 1 is declared by District Nazim/ DCO. For details of roles and responsibilities during Level 1 emergency please refer to National Disaster Response Plan 2010.
- **Level -2:** In this situation the Emergency/disaster situation overwhelms the capacity of the respective district or districts to manage the situation. The district Administration / DDMA requests for assistance to Provincial Government / PDMC through PDMA. The Chief Executive of the Province can declare it as divisional or provincial emergency Level 2. Actions and responsibilities are given in detail in National Disaster Response Plan 2010.
- **Level -3:** In this case the emergency/disaster event is way beyond the capacity of provincial/regional government and the province or provinces request for intervention from the federal government. This is called a national emergency which

is declared by the Prime Minister of Pakistan. If the scale is overwhelming even for the federal government an International Appeal may be launched for the assistance. Actions and responsibilities are enumerated in detail in National Disaster Response Plan 2010.

Figure 13: Emergency Response Management Coordination at Provincial Level



Further and Reading Reference

- *National Disaster Management Authority; National Disaster Management Plan 2010*
- *Community emergency Response Team Basic Training Participant Manual Developed for: National CERT Program Federal Emergency Management Agency Department of Homeland Security Washington, D.C 2011*

Unit 4.2

Name:	**Importance of Emergency Response with a focus on community preparedness**
Learning Objective:	- To know the importance of Emergency Response-ER at community level - To know various emergency response management activities undertaken at community level - To get familiarized with priority action of PDMA Sindh for promoting emergency response management activities in, Province
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Plenary, interactive discussion, learning from local experiences, group work, group presentation, audio visual aids, and Q/A

1. Introduction

The concept of people helping each other individually or in formal or informal groups during emergencies and crisis is not a new concept. Many studies of community behavior following any disastrous event show that communities working together cohesively in crises situation have a better chance to cope with negative impacts of the event and they perform more effectively, if they are prepared and trained for the event. Moreover, it is also a fact that that community level emergency response initiatives work more effectively, if they are interconnected with local social and political structures of the community and other existing grassroots organizations i.e. CSOs and CBOs.

Damages caused by natural disasters, such as floods, cyclone, earthquakes, and drought or the outcomes of human induced hazardous events like explosion, traffic accidents, industrial and domestic fires can seriously disrupt all aspects of a community. Depending on the scale and severity, these adverse events have potential to severely restrict or overwhelm local response resources, communications, transportation, and utilities. During and after any crisis situation the damaged communication infrastructure like roads, bridges and disrupted telecommunication communications systems restrict the access of emergency response agencies into the affected areas. Although, the state or government has the primary responsibility of safeguarding the lives, properties and livelihood of its citizen, however, at most of the times the communities who are at the forefront are left alone to bear the brunt. Due to restricted access, mobility and information after a disaster or the speed and suddenness of the event, the initial period immediately following a disaster (usually 2-3 days) the affected communities may need to rely on their own resources. Therefore, being isolated and cut-off from outside assistance in the face of a disaster can prove to be catastrophic for communities and people if they are not organized and prepared.

2. Community Level Preparedness for Effective Response

The community based preparedness initiatives enable the communities to prepare for and respond to any anticipated disruptions and potential hazards during and after any disaster. Starting at individual level, we can prepare and train our own family members on actions to be taken during the initial critical period following disaster. However, all households in a community acting together as an organized unit can prepare and train for working together, such joint actions can effectively reduce injuries, loss of lives, and property damages. The community level preparedness for managing crisis utilizing local knowledge and resources (local coping strategies) until professional assistance arrives significantly reduce community's reliance on outside assistance by minimizing their emergency needs and significantly reduce impacts of disasters. Preparedness measures at community level can take many forms including preparedness for:

- Light Search & rescue
- Basic Firefighting and prevention
- Emergency medical assistance including first aid and physiological support to victims
- Assisting in mass casualty management
- Transportation of victims

- Need assessment survey at community level
- Local health facility preparedness
- Community Evacuation
- Provision of food, water and non-food items
- Availability of Temporary shelter
- Emergency repair of critical facilities following disaster i.e. bridges, roads and telephone
- Security measures, tracing lost members and family reunification

Looking at the exhaustive list of preparedness actions which may be required at community level, comprehensive preparation, planning and coordination is required for effective response. Therefore, in order to prepare the communities to effectively perform emergency response functions needed in the immediate post-disaster period training and capacity building is essential. Trained and equipped community volunteer groups and members of community based organizations can serve as a crucial resource capable of performing (all or some) above mentioned emergency response functions.

3. Responsibility of Community Level Preparedness

Although, it is the government which has the primary responsibility of safeguarding the lives, properties and livelihood of its citizen in case of disasters and crises, but the individuals and communities who are at the forefront of any disastrous event have to realize that ***"the first and foremost responsibility of community level emergency response preparedness is on all community members"***. The community responsibilities include working together for gaining information about the likely hazards in community, to undertake community emergency response planning, initiating community hazard-specific protective actions, to learn relevant response skills, making local resources available, and mitigating all known potential hazards in community.

The necessity for involving communities to make comprehensive development strategies and disaster risk management plans emanates from global frameworks i.e. Sendai Framework for Disaster Risk Reduction and Sustainable Development Goals. As such, the importance and need for involving communities has been enshrined in National Disaster Risk Management Frame work 2007 and National Disaster Response Plan 2010. Therefore, considering the importance of emergency response at community level, there is a strong need to involve the communities in the emergency response planning process and also to include community human and material resources in all response activities of the government. Moreover, in order to access timely, reliable, and actionable information in post disaster situation the government should patronize and encourage community based emergency response initiatives by making available requisite knowledge, training and resources for such volunteer programs.

In addition, in pursuance of achieving development objectives put forward by global development and disaster risk reduction frameworks many NGOs, INGOs, UN and bilateral are also closely involved in promoting this particular theme all over Pakistan.

4. Importance of Emergency Response

The knowledge and skills acquired through community preparedness initiatives enhance individual and community's ability to be more resilient to any disruptive event. Therefore, communities working together cohesively in crises situation have a better chance to cope with negative impacts of the event and they perform more effectively. By learning emergency response skills and planning for coping with the aftermath of a disaster enable the individuals and communities to become a vital component of whole disaster risk management system. The community level preparedness for managing crisis utilizing local knowledge and resources until professional assistance arrives significantly reduce community's reliance on outside assistance by minimizing their emergency needs and significantly reduce impacts of disasters. Another perspective of looking at the importance of timely and effective emergency response through preparedness is to save precious lives of family members and fellow community members.

4.1. Basic Firefighting and Fire Prevention

We have seen that the domestic fires are one of the leading causes of injuries and deaths in communities and fires often result in considerable economic losses. It is well known fact that Knowledge and training on fire prevention & safety can prove to be most effective way for improving both fire related human and material losses. Therefore, it is the responsibility of all community members to acquaint themselves on this critical subject.

4.2. First Aid Medical First Response

First Aid is the initial immediate assistance or treatment given to someone who is injured or has suddenly fallen ill before the arrival of an ambulance, doctor or other appropriately qualified person. The survival of disaster victims also largely depends on injuries sustained by the victim, external factors like temperature and environment and victim's access to air and water after the impact. Various studies confirm that a vast majority of those affected by a disaster usually expire within first 72 hours, if not treated in time. In this regard, the term **"golden hour"** is a famous term used by hospital staff and emergency medical service (EMS) providers. It implied that an injured patient has 60 minutes (1 Hour) from the time of injury to receive definitive care, after which morbidity and mortality chances increase significantly. This term "Golden Hour" is generally attributed to Dr. R. Adams Cowley, Baltimore's Trauma Institute. In one of his articles in 1975, he stated, "the first hour after injury will largely determine a critically-injured person's chances for survival." This highlights the importance of timely and coordinated response by communities through learning adequate prehospital knowledge about care of disaster / emergency victims.

4.3. Light Search and Rescue

The community level light search and rescue means to find fellow community members impacted by disaster and help them. The goals of light search and rescue operations are to rescue the greatest number of people in the shortest amount of time during and after an emergency. To get the walking wounded and lightly injured survivors out first and rescue

lightly trapped survivors next. In doing so we have to always remember that that the rescuer's safety is priority No 1.

4.4. Early Warning

One of the foremost and fundamental aspects of ER management is early warning of the destructive event. In Pakistan the early warning system primarily caters for the hydro-metrological hazards i.e. mainly floods but drought situations are also monitored. Pakistan Meteorological Department (PMD) is the major government organization responsible for detecting imminent natural hazards and further disseminates the early warning information to all through different mechanisms. The PMD department is well linked with the National and Provincial Disaster Management Authorities. It also has dedicated provincial and district level EWS network to disseminate EWS when and wherever required. The information trickles down at community level through radio broadcast, TV emergency bulletins and new SMS/ texting service by the government. However, for localized emergencies it is the responsibility of communities to device and put in place such forewarning/ early warning mechanism which is suitable to local needs.

4.5. Emergency Evacuation

Temporary but speedy removal/ shifting of people from a dangerous/hazard prone building, areas or locality as a precautionary measure to save lives is called Evacuation. However, depends upon the severity of disasters, the evacuation process might vary from a few days to months. In the case it becomes permanent, we call it Relocation. At community level evacuation should be planned and rehearsed well in advance through drills during peace time. The aspects of forewarning, time and coordination, needs of special groups and safety of people in temporary shelters are very important during evacuation.

5. Priority Action Plan of PDMA Sindh for Promoting Emergency Response Management at Community Level in Province

Considering the importance of emergency response management at community level, PDMA intends to organize community/ village level small teams of volunteers, capable of undertaking local level hazard and risk assessment, disaster / emergency response planning, executing Light Search & Rescue, carrying out basic firefighting and prevention and emergency medical assistance (first aid) of victims.

Through this programme during the first phase, of which you are part, a total of 200 provincial and district officials shall be trained to manage and execute the second and third phases of programme. The first phase aims at providing government official (from Karachi, Sujawal, Badin, Tharparkar, Larkana, and Khairpur district) with orientation on CBDRM concept, its importance and significance. The second phase includes training of 150-200 master trainers for community volunteers. While the third and final phase will strive to train at least 1,000 community volunteers from selected priority districts, utilizing master trainer

created during phase two, in addition standard training toolkits will also be provided to every community team trained. The community training will cover basic skills that are important to know in a disaster situation, especially when emergency services are not available. The training will include local level hazard and risk assessment, disaster / emergency response planning, executing Light Search & Rescue, carrying out basic firefighting and prevention and emergency medical assistance (first aid) of victims.

On the one hand, the programme will enable district and provincial officials as leaders, to successfully develop, test, and refine emergency and disaster response plans by including communities, update the standard operating procedures -SoPs, continue training to acquire adequate skills and ensure preparedness of all services, departments and communities to protect people, save infrastructure and property and environment in respective districts. While on the other, the training of communities is designed to prepare them for helping themselves and assisting others in the event of an emergency or disaster to minimize the negative impacts of disasters. It is anticipated that, under the guidance of trained provincial and district officials and patronage of PDMA Sindh, these community teams will continue their training and capacity building activities for effectively protecting themselves and others from adverse impacts of disasters.

Reference and Further Reading

- *National Disaster Management Authority; National Disaster Management Plan 2010*
- *Community emergency Response Team Basic Training Participant Manual Developed For: National CERT Program Federal Emergency Management Agency Department of Homeland Security Washington, D.C 2011*
- *Article published on "Early Warning and Early Warning Systems" by International Institute for Disaster Risk Management.*
- *Early Warning - From concept to action, UN/ISDR, DKKV. 2006*

Unit 4.3

Name:	**Establishing DRR Committees and Assigning Roles and Responsibilities**
Learning Objective:	-To know the process of establishing the DRR committees at village and union council levels -To understand roles and responsibilities of DRR committees in disaster risk reduction and emergency response level
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multi Media, Cards, Flip Charts, Markers, White board and Markers
Training Techniques:	Group Work, Group Presentation, Interactive Discussion and learning from experience

1. Introduction

Union councils are the lowest tier in the government structure, elected representatives from the village and ward levels form part of these bodies. These bodies have in important role in allocation of resources for local development works. The Union Council plays an important role in relief distribution at village level in the disaster affected area. A number of villages fall under a single UC and the number can vary. It is strongly recommended to have UC and village level disaster management committees. The UC disaster management committees can play an important role in advocating demands of villages and communities to the District and Tehsil Disaster Management Authorities/Committees and the committees at village level is essential for realistic risk assessment, DRR planning and effective response.

2. Establishing DRR Committees at Community level

Community based disaster risk reduction demands active participation of community to conceive, design, plan and implement risk reduction activities. To ensure community participation, the best choice is to establish DRR committees and sub committees both at village and union council level in order to organize them and built their capacities in order to enable them to face the disaster and make them resilient community.

There can be many forms of sub-committees of the village level disaster management committee, for example; first aid sub-committee, search and rescue sub-committee, early warning sub-committee, shelter management sub-committee, evacuation sub-committee, protection sub-committee etc. Similarly, sub committees can further be formed in the union council disaster management committees for example; monitoring and evacuation sub-committee, liaison sub-committee, capacity building sub-committee, coordination sub-committee and fund raising sub-committee etc.

3. Potential Members of the VDMCs and UCDMCs

The selection of the members for the VDMC can vary from village to village and as per the requirement of CBDRM designed project. However, the suggested/ potential members of the VDMC can be *Lumberdar*, local School teacher, Imam Masjid, Lady Health Worker- LHW, Lady and Youth counselors, Kissan representative, representative from women, minorities and disabled people etc. Similarly, for the UCDMCs the possible members can be Union Council Secretary, two to four members from each VDMCs with at least one to two female representatives, local government officials, In-charge Medical Officer, BHU/Dispensary, High School/Middle School representative, representative of Civil Society Organizations and Religious Leaders etc. The members can further be added and reduced as per requirement.

4. Assigning Roles and Responsibilities of the VDMCs

The possible roles and responsibilities of the VDMCs can be as follows;

- Conduct participatory risk assessment of the village and update it time to time especially update it after every prominent disaster
- Develop village level disaster risk reduction plan for future planning and project implementation
- Monitor the running project and supply human resources
- Organize drills and simulation exercises along with other community members
- Maintain record of all CBDRM related projects

5. Assigning Roles and Responsibilities of the UCDMCs

The possible roles and responsibilities of the UCDMCs can be as follows;

- Conduct participatory risk assessment at union council level and while doing so, can also take support of assessment data collected by the VDMCs
- Coordinate and maintain working relationship with all local stakeholders involved in disaster management including Government, Non-Government Organizations and VDMCs.
- Develop financial proposal and mobilize financial and technical resources for project implementations
- Arrange basic, TOT and refresher courses for VDMCs and UCDMCs members and community volunteers
- Conduct regular meetings and circulate minutes of the meeting among the local government and other important stakeholders and respective VDMCs
- Stockpiling and maintain emergency response kits and update by provision of required equipment.
- Conduct simulation exercises and drills along with the local government, VDMCs and CSOs

References

- *Asian Disaster Preparedness Center Thailand (2011); Participant's workbook on "Community Based Disaster Risk Reduction" available at www.adpc.net*
- *National Disaster Management Authority Islamabad Pakistan (2019); CBDRM training toolkit available at http://www.ndma.gov.pk/publications/Participants'%20Workbook%20-%20Urdu.pdf.*
- *World Food Program Islamabad Pakistan (2011); training manual on "Community Based Disaster Risk Management".*
- *Provincial Disaster Management Authority Khyber Pakhtunkhwa (2014-15); Participant's workbook on "Community Based Disaster Risk Management".*
- *National Disaster Management Authority Islamabad Pakistan (2012); "Instructor's Guidelines on Community Based Disaster Risk Management", published under the NDMP Vol-III.*

Unit 4.4

Name:	**Hazard specific Community Based Early Warning Systems & Mechanism**
Learning Objective:	- To know about early warning systems in Pakistan and learn community level early warning system and mechanism for various hazards
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	PPT slides, interactive discussion, learning from local experiences followed with Q/A at the end of the session

1. Early Warning and Early Warning System

One of the foremost and fundamental aspects of ER management is early warning of the destructive event. A mechanism to warn people and communities before the event is known as Early Warning System (EWS). EWS can be defined as a systematic data collection of any imminent threats, the analysis and/or formulation of recommendations, and information sharing, whether they are qualitative, quantitative or a blend of both.

2. Flood Early Warning in Pakistan

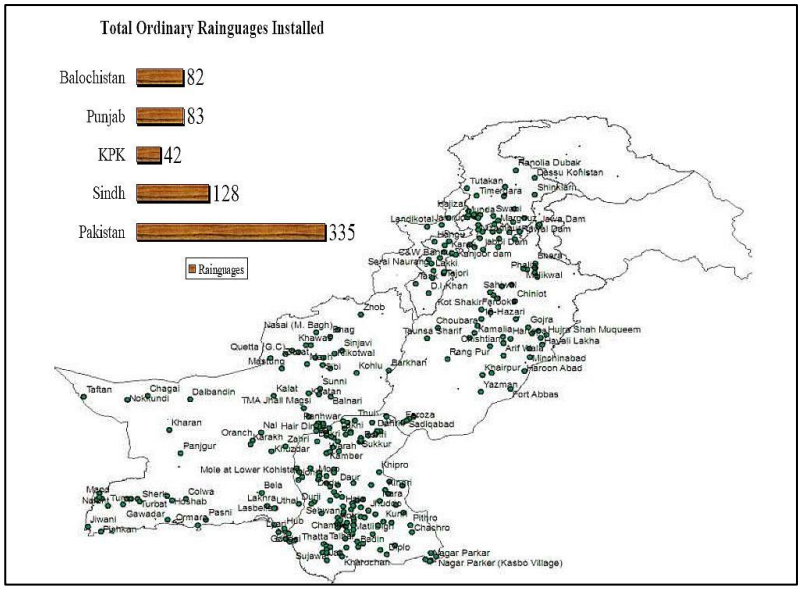
Pakistan Meteorological Department (PMD) is the major government organization responsible for detecting imminent natural hazards and further disseminates the early warning information to all through different mechanisms. PMD provides information and Flood Early Warning during the monsoon period. The information is generally shared from 15 June to 30 September each year by PMD with federal and all Provincial Governments. In addition, PMD also shares information with NDMA, PDMAs and all relevant federal/Provincial departments. The PMD is well linked with the National and Provincial Disaster Management Authorities. It also has dedicated provincial and district level EWS network to disseminate EWS when and wherever required. The largest provincial warning centre is Flood Warning Centre, Lahore. It works closely with the PMD and Federal Flood Commission. The Centre issues early warning to the Pakistan Meteorological Department, Federal Flood Commission, provincial irrigation departments and media. The Centre also issues warning directly through electronic and print media.

3. Drought Early Warning in Pakistan

PMD took an initiative to establish National Drought/Environment monitoring and Early Warning Centre (NDMC) in 2004-05 after the worst drought during 1999- 2001 in Pakistan. The main objective of centre is to monitor drought situation in the country and issue advisory before time. Its national center is in Islamabad while four Regional Drought Monitoring Centers (RDMC's) are in Lahore, Karachi, Peshawar and Quetta. These four RDMC's cover those regions which comes under their jurisdiction. These centers serve as a hub for the monitoring, collection, consolidation and analysis of drought related data from all the possible sources in the country.

In order to strength the network, 50 Automatic weather stations (AWS) have been installed in different regions particularly the drought prone areas of the country. The data of eleven meteorological parameters (air temperature, humidity, wind speed, wind direction, dew point, sea level pressure, station level pressure, solar radiations, soil moisture at standard Depths (5,10,20,50,100) cm and snow level are transmitted through satellite and GPRS technology every three hours. The information is shared fort-nightly and three monthly updates. NDMC has also installed 335 Ordinary Rain gauges at districts level in four provinces to monitor the drought situation as shown in figure below:

Figure 14: Rain gauges at Districts Level



Source: PMD Pakistan

In addition, SUPARCO issues monthly crops situation updates by using Keetch Byram Index[4] and WFP disseminates monthly market prices bulletin and quarterly food security update;

4. Objective of an EWS

- Empower individuals and communities threatened by hazards to act in sufficient time and in an appropriate manner;
- Systematically collecting data and undertaking risk assessment;
- Developing hazards monitoring and early warning services;
- Communicating risk information and early warnings;
- Building community response capacities.

5. Community Based Early Warning System -CBEWS (Flood, Cyclone and Drought)

Community-Based Early Warning Systems (CBEWS) are planned, anchored and managed at local levels by the communities. They are engineered to forewarn communities at local level to act in sufficient time and in an appropriate manner so as to reduce the possibility of personal injury, loss of life, damage to property and the environment, and loss of livelihoods. These systems are based on a "people-centered" approach to empower the individual and affected communities to take appropriate action to protect their lives and belongings. CBEWS help to reduce economic losses by enabling communities to be better prepared and make them resilient against the disastrous effects of any event. The fundamentals requirement for an effective CBEWS are information and knowledge about the

[4] *https://www.wfas.net/index.php/keetch-byram-index-moisture--drought-49*

impending event, medium of communicating signs, warnings and threats and understanding on the actions to be initiated in case imminent threat.

5.1. Formation of Community Based EWS Committee

The communities should be well prepared and nominate a committee (Early Warning System Committee) for drought/floods, essentially with assistance of government departments, CBOs, CSOs and NGOs in the area. The committee should be mandated for monitoring the drought/ flood hazard and dissemination of information - warning/forecast. After nomination the committee can assign primary and secondary roles and responsibilities to its member individuals and sub-groups. The committee members should be properly trained, given requisite knowledge and awareness about the stakeholders involved, credible information sources and how to timely disseminate information on impending hazards.

5.2. Community Based Early Warning System-Operation

The members of committee should be properly trained and linked with relevant district level department i.e. DDMA, local government, agriculture and irrigation departments. It is commonly observed that various technical terminologies are used for disseminating the drought and flood EWS information once it is transmitted from national and provincial sources. It is important to know the meaning of those technical terms and further transmitting the information into local language using easy and user friendly terminologies which could be comprehended by all.

It is also suggested to utilize multiple communication channels / sources for dissemination warning e.g. community meetings, notices, posters, verbal or pictorial messages, Radio/TV, mosques, local newspapers and other appropriate indigenous means. For wider dissemination of the messages/warning updates, “Information Boards” can be placed at various important locations in the communities such as:

- Schools or government buildings
- Stores/bazaars
- Bus/wagon stands
- Outside mosques or any other religious/ social gathering places

5.3. Essential Features of Community Based Early Warning System

- All community members especially the vulnerable groups should be involved at all stages of the CBEWS from planning, designing, operations, dissemination of hazard warning messages and responding to the warnings.
- Action and decisions should be based on universal needs of everyone in the community, while prioritizing women, children and vulnerable segments of the community.
- The CBEWS is planned, designed, operated and owned by the community members.
- CBEWS measures should enhance the capacity of the community members to respond and deal with their situation.

6. Challenges in Community Based Drought Early Warning System

Communities in district Sanghar, Tharparker and in some part of Mirpur Khas and Umerkot remain constantly at a risk of drought. Drought is not a sudden phenomenon neither does it is constant. It can happen intermittently, however whenever it occurs it brings food insecurity, starvation, malnutrition, famine and spread of epidemic. According to the Joint UN Needs Assessment, the drought of 2013-2016 severely affected many districts of Sindh by creating extreme water scarcity (62% in Jamshoro and 100% in Tharparkar), and resulted in reduced harvest by 34-53% and livestock by 48%, respectively.

An effective drought early warning system can play important role in warning local communities when there is risk of a drought, improving preparedness and decreasing risks associated with crop and food loss. Effective warning systems require drought monitoring using appropriate drought indicators, meteorological data and forecasts, a warning signal, public awareness and education, institutional cooperation, and data sharing arrangements. Therefore, one of the major challenges for drought monitoring is the integration of hydrological, meteorological, agricultural and socio-economic information. In addition, the unpredictable weather patterns resulting from climate change make drought early prediction extremely difficult.

PMD has established a data-collection mechanism for developing an effective early-warning system by ascertaining drought conditions. Although, meteorological data is important, it only represents a part of a comprehensive monitoring system. Other physical indicators (such as groundwater and stream flow) must also be developed and monitored to reflect the impacts of drought on agriculture, households, industry, energy production and water use. Ideally, an early warning system should incorporate technology such as soil-moisture sensors, automated weather stations and GIS/remote sensing, as well as advanced modeling for climate forecasting. PMD through local radio networks and bulletins disseminate early warning on drought, especially to local farmer communities in rural areas of Pakistan. At the same time, NGOs, I/NGOs and CSOs are also actively working with the communities to work in drought risk management and run parallel interventions and project in Province.

References

- *Article published on "Early Warning and Early Warning Systems" by International Institute for Disaster Risk Management.*
- *A community based early warning system in Malawi at http://ec.europa.eu/echo/files/aid/dipecho/malawi_christian_aid_en.pdf.*
- *Save the Children UK experiences on piloting Community Based Early Warning Systems in 3 districts of Somali and Afar Regions of Ethiopia "What worked and what didn't" by Abdurrahman Ali Issack and Ahmed Yusuf, Consultants, 2010.*
- *Climate Change Adaptation Technologies for Water - A practitioner's guide to adaptation technologies for increased water sector resilience Water Adaptation Technology Brief.*
  https://www.ctcn.org/sites/www.ctcn.org/files/resources/drought_early_warning_systems.pdf
- *Early Warning - From concept to action, UN/ISDR, DKKV. 2006.*

Module-5

Participatory Risk Assessment (PRA) and Disaster Risk Reduction DRR Planning at Community level

Unit 5.1:	Multi-Hazard Vulnerability and Capacity Assessment-HVCA
Unit 5.2:	Risk identification and assessment- Participatory Rural Appraisal -PRA Tools used for risk assessment at community level
Unit 5.3:	Disaster Risk Reduction-DRR Planning at Community Level (Need and Importance)

Outcomes

Upon completion of this Module you will be able to:

- Understand the structure, process and key components of a Multi Hazard Vulnerability and Capacity Assessment at community level
- Understand the process and methodology of participatory rural appraisal -PRA at community level and get familiarized with a wide variety of hazards, vulnerabilities and capacities assessment tools
- Learn the use of various PRA tools for risk assessment and be able to select those which are best suited to determining hazards, vulnerabilities and capacities at community level
- Understand the process of DRR planning at community level

Unit 5.1

Name:	**Multi-Hazard Vulnerability and Capacity Assessment-HVCA**
Learning Objective:	-To understand the structure, process and key components of a successful Multi Hazard Vulnerability and Capacity Assessment at community level
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multi Media, Cards, Flip Charts, Markers, White board and Markers
Training Techniques:	Group Work, Group Presentation, Interactive Discussion

1. Introduction and Overview of Key Concepts

UNISDR describes disaster events as "A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts". However, it has to be considered that natural events such as rains, winds, earthquakes, floods, cyclones and rising temperatures alone cannot cause serious disruption of the functioning of a community or society. This happens only as a result of the combination of exposure to a hazard when the conditions of vulnerability are present and the people have insufficient capacity or measures to reduce or cope with the potential negative consequences of hazard event. Negative impacts may include loss of life, injury/ disease and other adverse effects on human physical or mental health, along with destruction of individual property, community assets, social services and environmental degradation.

Table 8: Recap of Important Definitions

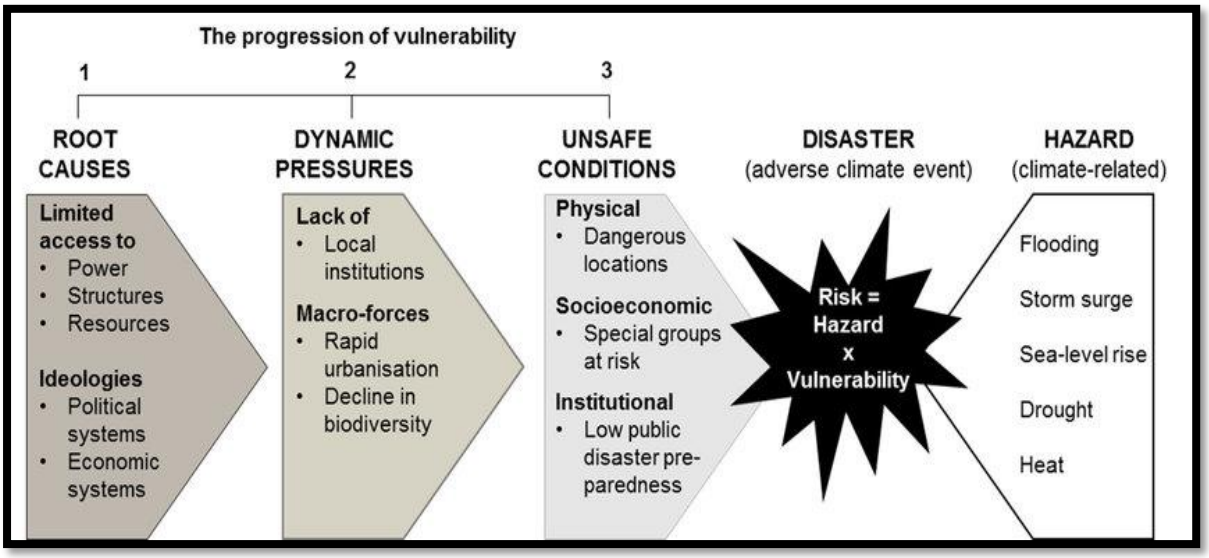
Disaster	A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts which, exceeds the ability of the affected community or society to cope using its own resources.
Hazard	A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. It can be natural or human induced
Natural hazard	Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Natural Hazards essentially can be categorized as biological hazard, geological hazard and hydro-meteorological hazard.
Anthropogenic hazards	Events, substance or conditions caused by human action or inaction that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Anthropogenic Hazards include oils spills, industrial and urban fires, pollution and environmental degradation etc.
Vulnerability	The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Such as poor building design and construction, inadequate protection of assets, lack of public information and awareness, limited recognition of risks and preparedness measures and disregard for good environmental management.
Capacity	The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals. Capacity of a community is categorized as "Coping & Adaptive Capacity". The coping capacity refers to the "ability of people, organizations, and systems, using available skills and resources, to face and manage adverse conditions, emergencies, or disasters and adaptive capacity refers to the ability of a system or individual to adapt to climate change, but it can also be used in the context of disaster risk

Source: Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction - 1 December 2016

2. Understanding Disaster Risk

In 2003 Dr. Ben Wisner of University College London illustrated how disasters occur when hazards affect vulnerable people, through his famous Pressure and Release Model (PAR Model) also known as Crunch Model. The Pressure and Release Model (PAR Model) is a model that helps us to understand disaster risk in terms of vulnerability analysis in specific hazard situations. The Model shows that a disaster occurs only if a hazard impacts vulnerable communities or group of people. We understand that communities and people are vulnerable when they are unable to adequately anticipate, withstand and recover from a hazard or in other words when they lack the requite capacities.

Figure 15: Pressure and Release Model (PAR Model)



Source: Dr. Ben Wisner 2003

The model has two distinct dimensions i.e. hazard and vulnerability, both of which influence the disaster risk. The level of disaster risk for the communities depends on both of the dimensions, the magnitude of the hazard as well as the degree of vulnerability of the people. A disaster cannot occur if there is only hazard which is present without its intersection with a vulnerable group of people community, similarly a vulnerable community is not at a risk of being adversely affected without the occurrence of any type of hazard. Therefore, to understand the disaster risk faced by a community both the dimensions should be analyzed and assessed. The process of identifying, analyzing, assessing and prioritizing the risk as an outcome of connection between any hazardous event and the latent or evident vulnerabilities of communities is known as Hazard, Vulnerability and Capacity Assessment – HVCA.

The hazards are phenomenon, substance, human activity or condition. The frequency, intensity and behavior of a hazard can be understood by examining its warning signs, force, speed of onset, frequency, time and duration etc. For example, the riverine floods follow a specific pattern in their time of onset, intensity, and magnitude. However, the vulnerabilities are much more complex and shrouded in layers of social processes i.e. root

causes, dynamic pressures and unsafe conditions. The root causes lead to dynamic pressures that explain how the unsafe conditions have arisen and persisted. For example, for communities prone to flooding in Sindh living along River Indus, poor housing conditions, dangerous location, risky livelihoods and lack of disaster preparedness skills are their unsafe conditions. While, the dynamic pressures can be the absence of community based organization for collective efforts to reduce flood risks and lack of access to local agricultural markets for farmers, but the reason, root causes of aforementioned rests in the lack of government policies, lack of development initiatives and inhibited progress on flood mitigation and emergency response preparedness by public authorities etc. Therefore, DRM practitioners often use this PAR model to analyze and examine the causes of vulnerability during disaster risk assessment.

3. Hazard, Vulnerability and Capacity Assessment – HVCA

Hazard, Vulnerability and Capacity Assessment (HVCA) is an investigative process designed to assess the risks that people and communities face in their locality, their vulnerability to those risks, and the capacities they possess to cope with hazards and recover from them when they strike. Depending on the requirement HVCA can have national, provincial or local level scope and can be undertaken by a variety of techniques ranging from use of satellite and GIS maps to analytical door to door survey.

3.1. Hazard Assessment

Hazard assessment involves examining force, warning signs, speed of onset, frequency, time of occurrence and duration of any given hazard. However, the climate or weather related hazards, especially hydro-metrological hazards should also be considered and analysed in the context of a phenomenon of climate change, as the frequency, intensity and seasonality of climate related hazards, especially such as floods, cyclones and droughts can be affected. According to the Global Climate Risk Index (2017) 5, Pakistan and Bangladesh have been listed in the top ten highest at risk countries to climate change. Various methodologies and tools employed during local level hazard assessment process while working with communities will be discussed subsequently in next session.

3.2. Vulnerability Assessment

Vulnerability Assessment is the process of examining the susceptibility of 'elements at risk' to various hazards and analyzing the causes behind their vulnerability. The elements at risk include but are not limited to people, physical infrastructure, critical facilities and community assets. The vulnerability assessment takes into account the physical, geographical, economic, social, political and psychological factors, which make some communities more vulnerable to hazard(s) while others remain relatively protected. A

[5] *"German Watch-Global Climate Risk Index 2017," https://germanwatch.org/en/12978, German watch*

variety of tools are used to ensure community's participation in vulnerability assessment which will be explained in detail in the subsequent session.

3.3. Capacity Assessment

Capacity assessment is an analytical process of determining as to how people and communities cope with the negative impacts in times of crisis. In relation to any hazard situation these capacities can be categorized as capacity to anticipate, capacity to withstand or face and finally capacity to recover themselves from the adverse impacts of any given hazard utilizing available skills and resources. Through capacity assessment, the community's coping strategies and resources, which are available, for disaster preparedness, mitigation and prevention are identified. The capacity assessment process involves two main components, first is the understanding of previous experiences with hazards and the coping strategies that have been developed and second is taking into account the resources that are available and used by the community to reduce disaster risk. The methodology and tools required to gauge the community capacity are discussed in detail in the subsequent session.

4. Multi-Hazard Vulnerability and Capacity Assessment

It has to be kept in mind that any community can be exposed to more than one hazard. In such situations it is crucial to identify the potential losses and damages from the various different kinds of hazards. On exposure different hazards cause differential impacts on elements- at risk. For example, the earthquakes are extremely hazardous for people and infrastructure but at the same time crops and environment remain relatively unharmed. While, on the other hand the riverine floods may not be as dangerous to the life and safety of people and infrastructure but surely they can destroy crops and environment at colossal scale. Therefore, in order to ascertain the disaster risk faced by a particular community more often than not more than one hazard has to be considered while analyzing and prioritizing

5. Gender Socio-Economic Status and Disasters

The disasters are experienced differently by men, women, girls, boys, and rich and poor. Nature does not discriminate or distinguish on the basis of genders, socio-economic status, race or culture, but we human beings do. Therefore, the social, cultural, economic, and religious ideologies of people create patterns of authority, prejudice, discrimination, and even exploitation in a society/ community. As a result of these deeply entrenched cultural and socio-economic behavior patterns of a society certain groups of people are likely to suffer more than others before, during and after disasters. These patterns are also the reason, as to why men, women, rich and poor have dissimilar coping mechanisms for response to crisis situation, different abilities and diverse levels of resilience. Most prevalent negative social patterns which are required to be addressed while undertaking participatory risk assessment are gender inequalities, socio-economic inequalities and power imbalance in community.

6. Differential Vulnerabilities and Capacities

Factors like socio-economic and gender inequalities and power imbalance in a society manifest themselves in shape of differential vulnerabilities and limited capacities resulting in increased impacts on certain groups i.e. women, children, elderly and poor. A 2007 study conducted by London School of Economic from a sample of 141 countries from 1981 to 2002 shows that, natural disasters and their subsequent impact, on average, kill more women than men or kill women at an earlier age than men related to women's lower socio-economic status6 . Many other studies also point out that women from same socio-economic status are affected more significantly as compared to men in a society during and after disasters. Poverty and vulnerability are interconnected, poor are more likely to live and work in areas exposed to potential hazards due to lack of material and financial resources and are also less likely to have the capacities and resources to cope when a disaster strikes. At the local level, the most important factor concerning vulnerability is the level of income (Bishop 1998). Following aspects make certain groups i.e. women, children and poor more susceptible to the negative impacts of hazards.

Figure 16: Factors making Some Groups in Society are More Susceptible to Negative Impacts of Hazards

Before Disaster

- Unequal representation in planning and decision making phase
- Considered helpless victims and dependents
- Capacities overlooked &underused
- Lack of opportunities resulting in low or no preparedness
- Scarce Resources and limited choices
- Minimal access to information early-warning systems

During Disaster

- Inability to defend themselves
- Increase vulnerability to violence GBV and SEA
- Cultural and social practices
- Restricted mobility
- Responsibility for dependents enhances risks
- Women are less likely than men to have lifesaving skills

After Disaster

- Lack of privacy inappropriate facilities in camps and temporary shelters
- Increased responsibility of providing and Managing
- Inaccessibility to relief / aid
- Victim of GBV in camps and temporary shelters

[6] *Neumayer and Plümper, 2007*

Traditionally and culturally in rural Sindh women have less access to information and resources in order to prepare and mitigate a disaster. In the aftermath of a disaster, affected populations may often need to relocate for a period of time. The disasters might lead to increased trends of domestic violence and exploitation e.g. during and after relocation and displacement the women and children are particularly vulnerable. The loss of homes, livelihoods, community, and family protection increases their vulnerability to all type of exploitation and violence. Moreover, during and after disasters poor households can experience even increased levels of poverty due to scarce resources, limited choices and opportunities.

It is generally observed that the special needs of above mentioned groups in disaster risk management and preparedness planning is often overlooked. Policymakers, social services, and law enforcement agencies often do not include training and awareness-raising related to protocols for addressing GBV and SEA, thus limiting their ability to respond appropriately to special needs of these groups once affected by a disaster. Moreover, due to social stigma and shame associated with GBV and SEA incidents, the reported case are very low and lack of data on the prevalence of GBV and SEA during disasters also contributes to this lack of awareness7 . Therefore, it is important that each hazard and respective causes of vulnerability should be identified and assessed with regards to men women, boys and girls and poor. The gender aspects and socio-economic factors enhancing or creating vulnerability conditions should be comprehensively considered in hazard, vulnerability and capacity assessment.

7. Summary

Natural disaster and complex emergencies have significant impact on persons and communities. The socio-economic impact of disasters can seriously stagnate or even reverse sustainable development. Extreme natural events are not only the cause of increased disaster risk faced by the communities; their vulnerability and exposure to various hazards also play a critical role in exacerbating the risk. On one hand, due to climate change an increased number of natural hazards are resulting in high exposure of communities, assets and infrastructure across the province, while on the other, a diverse range of social, economic, and environmental conditions have enhanced their vulnerabilities to these extreme natural events. Therefore, hazard and vulnerability are the two main dimensions that should essentially be analysed when undertaking a disaster risk assessment Moreover, it is important that each hazard and respective causes of vulnerability should be identified and assessed with regards to men women, boys, girls and poor. The gender aspects and socio-economic factors enhancing or creating vulnerability conditions should be comprehensively considered in hazard, vulnerability and capacity assessment. The starting point for reducing disaster risk lies in the knowledge of the hazards and the physical, social, economic and environmental vulnerabilities and of the ways in which hazards and

[7] *Unseen, Unheard: Gender Based Violence in Emergencies A Global Study, IFRC*

vulnerabilities are changing in the short and long term, followed by action taken on the basis of that knowledge." – Hyogo Framework for Action 2005-2015

Reference and Further Reading

- *UNISDR Terminology on Disaster Risk Reduction 2009*
- *Unseen, Unheard: Gender Based Violence in Emergencies- A Global Study, IFRC*
- *What is VCA? An introduction to vulnerability and capacity assessment- IFRC*
- *Community-based Disaster Risk Management for Local Authorities- Participants Work Book- ADPC*

Unit 5.2

Name:	**Risk identification and assessment-Participatory Rural Appraisal-PRA Tools used for Risk Assessment at community level**
Learning Objective:	-To understand the process of participatory rural appraisal –PRA at community level -To get familiarized with a wide variety of hazards, vulnerabilities and capacities assessment (PRA) tools for risk assessment -To learn the use of various PRA tools for risk assessment and be able to select those which are best suited to determining hazards, vulnerabilities and capacities at community level
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multi Media, Cards, Flip Charts, Markers, White board and Markers
Training Techniques:	Group Work, Group Presentation, Interactive

1. Introduction

Natural disasters have significant impact on persons and communities. The socio-economic impact of disasters can seriously stagnate or even reverse sustainable development. The fact that each year, natural disasters push 26-million people into poverty, undermining development gains and increasing dependence on aid[8] emphasizes the importance of establishing strong linkages between social and economic development strategies and disaster risk reduction efforts. In Sindh Province, extreme natural events are not only the cause of increased disaster risk faced by the communities; their vulnerability and exposure to various hazards also play a critical role in exacerbating the risk. On one hand, due to climate change increased number and frequency of natural hazards are resulting in high exposure of communities, assets and infrastructure across the province, while on the other, a diverse range of social, economic, and environmental conditions have enhanced their vulnerabilities to these extreme natural events. Therefore, hazard and vulnerability remain two key fundamental dimensions that should essentially be analysed when undertaking disaster risk assessment at community level.

2. Participatory Rural Appraisal - PRA

Participatory Rural Appraisal - PRA is an approach developed in early 1990s for learning in detail about rural life and conditions from people and communities. Chambers (1992) has defined PRA as an approach and methods for learning about rural life and conditions from, with and by rural people. He further states that, PRA extends into analysis, planning and action by closely involving villagers and local officials in the process. It is also considered as one of the most popular and effective approaches to gather information in rural settings by social scientists. Participatory, means that local communities are involved in the process of Appraisal which means finding problems, needs, and resources in a village and exploring details in rural setting. PRA involves certain analytical tools based on local community inclusive methodology for learning about the conditions, problems, needs and challenges of rural life and environment by involving people. This technique can be employed in any situation, urban or rural, while working with both educated and uneducated communities. It requires researchers / field workers to act as facilitators to help local people conduct their own analysis, plan and take action accordingly. It is based on the principle that local people are creative and capable and can do their own investigations, analysis, and planning. In short, the basic concept of PRA is to learn from rural people.

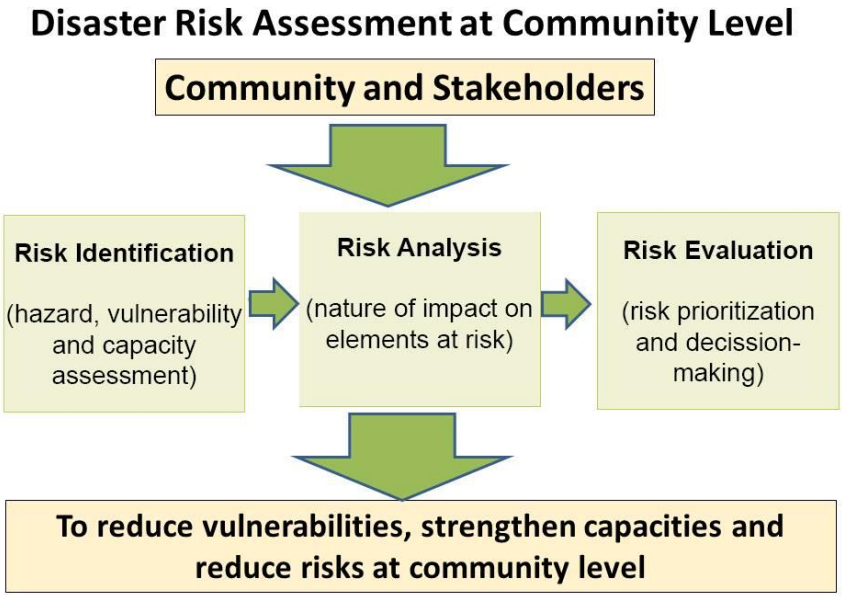
3. Disaster Risk Assessment at Community Level

At community level the process of determining the nature, extent and scale of adverse impact of any hazard or hazards to the community is a known as Community Risk Assessment – CRA. Through this participatory process we can understand the possible adverse impacts on the 'elements at risk' which at community level include people, community structures, facilities like schools and hospitals, livelihood and economic resources, community resources such as equipment, crops, livestock etc. and communication infrastructure to

[8] Building the Resilience of the Poor in the Face of Natural Disasters (World Bank, 2016)

include access roads and bridges. The risk assessment also enables us to understand that as to why particular group or groups in a community are more vulnerable to specific hazards

Figure 17: Process of Disaster Risk Assessment



while others are relatively unaffected. During the process we also identify the community's coping mechanisms and the resources present in the community.

Community level risk assessment is a social process; therefore, it is guided by the fundamental principles of PRA. Participation of community members is an essential component in any community risk assessment process. The level of participation by the communities determines the methodologies and tools to be used. Community risk assessment can serve a multitude of purposes; it provides us with disaster specific baseline data that can be used not just in disaster specific planning but also for development planning purposes. Community Risk Assessment can also provide us with valuable information that can be utilized as informed estimates of a certain area to make district, provincial and national contingency and emergency response planning. CRA process at community level consists of three interrelated steps i.e. Risk identification, risk analysis and finally risk evaluation.

3.1. Hazard assessment

Hazard assessment involves examining force, warning signs, the speed of onset, frequency, time of occurrence and duration of any given hazard. However, the climate or weather related hazards, especially hydro-metrological hazards should also be considered and analysed in the context of a phenomenon of climate change, as the frequency, intensity and seasonality of climate related hazards, especially such as floods, cyclones and droughts can be affected.

Hazard assessment is exploring the physical properties of hazards or threats. Therefore, we need to identify nature and behavior of hazards. Following aspects are probed in detail:

- Intensity and Magnitude.
- Speed of onset
- Frequency
- When (At what time on year)
- Duration
- Warning signs, indicators and signals
- Is there any forewarning (time between warning signs and impact of hazard)?

There are several PRA tools that can help in hazard assessment. Different PRA tools exist however, the most commonly used tools are the following:

- Hazard map: Maps are drawn to locate the probable area covered by a hazard's impact and the elements at risk.
- Community Historical profile or time line: These tolls can assist us understand how hazards have changed over time; which hazards have happened in the past; or the start of particular hazard occurrence etc.
- Seasonal Calendar: This particular tool visualizes the time, frequency and duration of hazards

Table 9: Hazard Matrix

Hazard type	Intensity	Warning signs	Speed of onset	Frequency	Duration	When	forewarning	Areas affected
Flood								
Drought								
Earthquake								
Landslides								
Pollution								
Heatwave								
Cyclone								

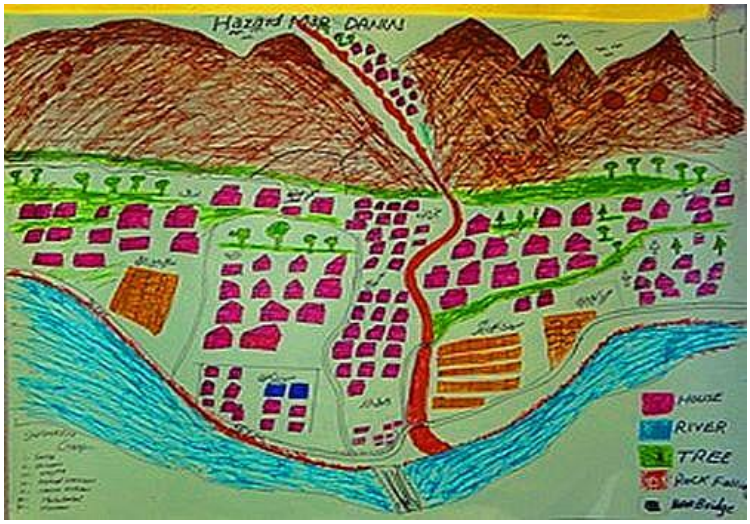
Table 10: Historical Profile

Hazard Type	Year/ Season	Month	Crops damaged	Boats destroyed	Houses damaged	Deaths/ Injury	Area/ locality	Intensity	Duration
Flood									
Drought									
Earthquake									
Landslides									

Table 11: Seasonal Calendars

Hazard Type	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep
Flood									
Drought									
Earthquake									
Landslides									
Pollution									

Figure 18: Community Hazard Maps



3.2. Community Vulnerability Assessment

This is a process of examining the susceptibility of 'elements at risk' to various hazards and analyzing the causes behind their vulnerability. The elements at risk include but are not limited to people, physical infrastructure, critical facilities and community assets. The vulnerability assessment takes into account the physical, geographical, economic, social, political and psychological factors, which make some communities more vulnerable to hazard(s) while others remain relatively protected. Poverty status, education, communication and transportation systems, accessibility of public resources such as forest produce, government facilities and drinking water, and presence of agricultural banks/credit banks, NGOs and other service delivery institutions can be used for assessment of vulnerabilities in an area. A variety of tools are used to ensure community's participation in vulnerability assessment, some of the most commonly used PRA tools are as below:

- Hazard maps - helps in visualizing the 'elements at risk'. Hazard map drawn to locate the probable area covered by a hazard's impact and interaction with elements at risk
- Vulnerability Matrix- Helps is identifying the location and extend of damages
- Transect walk - helps to get a better understanding of the community map and affords opportunity to ask more questions on physical/material vulnerability
- Seasonal calendar - gives insight on periods of stress, diseases, hunger, debt, etc.
- Livelihood analysis - gives a picture of the varying effects of hazards on different households and groups
- Venn diagram - shows the state of coordination among organizations and Government agencies or leadership patterns
- Community drama - enables people to express what happens during disasters and why
- Problem tree and Ranking - shows linkage of vulnerabilities and enables the community to express the priority vulnerabilities to address.

Table 12: Vulnerability Assessment (Hazard) Matrix

Elements at Risk	Flood	Drought	Earthquake	Landslides	Cyclone	Heatwave	Reason of Vulnerability	Location
People								
Houses								
Bridges								
School								
Health Centre								
Crops								
Boats								

Table 13: Vulnerability Assessment (Socio-economic)

Vulnerability Indicators	Percentage or Number of People without Critical Facilities				
	Area/ Loc	**Area/ Loc**	**Area/ Loc**	**Area/ Loc**	**Area/ Loc**
Road access					
Drinking Water					
Health Facility					
Education Facility					
Toilet					
Electricity					
Telephone/ Mobile					
Television					

3.3. Community Capacity Assessment

Capacity assessment is an analytical process of determining as to how people and communities cope with the negative impacts in times of crisis. In relation to any hazard situation these capacities can be categorized as capacity to anticipate, to withstand or face and finally to recover themselves from the adverse impacts of any given hazard utilizing available skills and resources. Through capacity assessment, the community's coping strategies and resources, which are available, for disaster preparedness, mitigation and prevention are identified. The capacity assessment process involves two main components, first is the understanding of previous experiences with hazards and the coping strategies that have been developed and second is taking into account the resources that are available and used by the community to reduce disaster risk. Some of the suitable methodologies and tools utilized commonly to gauge the community capacities are given below.

Tools:

- Community Resource Mapping- Resource mapping (also known as asset mapping) is the process of identifying what is valuable in your community and developing strategies for mobilizing those resources before during and after emergency or disaster
- Historical profiles and time lines – They can reveal how people cope with adverse events in the past
- Seasonal calendars- Shows us the coping mechanism adopted by the communities
- Gendered resource mapping shows differences in access to and control over resources between men and women of community
- Livelihood Analysis - Insights on the coping strategies of individual households
- Institutional and social network analysis - Formal and informal service structures present in area
- Community Discussions – The information gained will help us in knowing the resources present in a community, especially such interviews provide valuable qualitative information.

Table 14: Community Capacity Resources Mapping (Own)

Resources	Lumber / Wood	Building / Digging Equipment	Veh/Tractors Trolleys/ Buses Motorcycle etc.	Boats	Volunteers Trained/ Untrained	Generator/ Fuel	Food items	Medical Supplies	Community Funds	Any Other
Location										
Location										

Table 15: Community Capacity Resource Mapping with Government

Resources	Sand Bags	Equipment	Vehicles	Boats	Dewatering Pumps	Evacuation Centre	Tents	NFI	Food items	Emergency Cash	Medical Supplies
Location											
Location											

Table 16: Sample Questionnaire of Community Discussions

- No of Community Social & Religious organizations working on disaster response /awareness
- No of External actors i.e. NGOs and INGOs working on disaster response and awareness
- Early warning systems time of warning in hours
- No of villages Covered Out reach of Early warning system
- No of literate adults (males/females)
- No of disable (adults, children, females/males)
- No HH Access to electronic media TV, Radio & internet
- Emergency Response Plan Exist Y/N
- Evacuation Plan exists Y/N
- Early warning available in hours before disaster
- No of villages - Out reach of early warning
- No of community emergency response teams
- No of PRCS volunteers/ teams
- No of female community emergency response volunteers
- No of Religious/Welfare organization networks working on emergency response
- No of External actors i.e. NGOs and INGOs working on emergency response
- Is Pak Army involved in emergency Response? Y/N
- No of Health facilities and staff
- No of Evacuation Centers/ schools used as evacuation centers
- No of Displaced Pop last year floods
- Risk transfer mechanism such as insurance and loans Exist Y/N

Note:
The list could be populated as per the need, scope and objective of the assessment. The Presence of service delivery institutions, banking organizations, human resources, status of media, and availability of disaster preparedness services and equipment will reflect the capacity of a community

4. Community Risk Analysis

After undertaking hazard, vulnerability and capacity assessment, it is essential to conduct risk analysis. The risk analysis will enable the community and the local authorities to understand the potential impact of various hazard events. Risk analysis involves the development of risk scenarios based upon the information obtained assessment about hazards, their frequency and intensity and the elements-at-risk. During risk analysis we identify what kind of impact a hazard will have on various at-risk-elements; e.g. people, houses, crops, buildings, roads, schools etc. It also identifies the extent of the impact; e.g. how many people might get killed, how many might be injured, how many hectares of land will be negatively affected or inundated. However, certain communities may be exposed to more than one hazard at the same time. In such situation or area, it will be important to identify the potential losses from the all kinds of hazards or impending hazards. As we have

learned in previous session that different hazards may have differential impact upon various elements at risk and a hazard can impact many elements at risk in different manners For example, the droughts do not damage infrastructure but is detrimental to public health while the floods tend to affect the Katcha and semi Katcha house more in comparison to the pacca brick structures. At the same time some hazards can also cause secondary hazards e.g. the earthquakes can cause landslides; drought might trigger malnutrition and water borne disease and pest infestation; floods might carry pollution and cause epidemics etc.

The analysis can combine both scientific and empirical data about the known hazards and possible threats to the community. It has been understood that while working with communities the indigenous knowledge is vital, but scientific data is also important in a situation when the hazard has not yet been experienced by the community e.g. the effects of climate variability on a given community in future or the impact of building a dam on a river system close to community.

Graphic visual representation in shape of risk map can be produced by superimposing the hazard risk maps with physical aspects of vulnerability to various elements at risk and the available resources in community. These hazard maps overlaid with information on physical vulnerability of communities vise-vise capacities and resources available can be extremely helpful in the risk analysis. This type of visual risk analysis shows the results of both hazard and vulnerability analysis and at community level it is regarded as an important tool in risk analysis. However, another way of doing it is by hazard probability (hazard) and damage potential (vulnerability) matrix as shown in the table below.

Table 17: Sample Risk Analysis at Union Council

Damage potential	Hazard Probability				
	Very low	Low	Medium	High	Very high
very low	VLR	VLR	LR	LR	LR
low	VLR	LR	LR	MR	MR
medium	LR	LR	MR	HR	HR
high	LR	MR	HR	VHR	VHR
very high	LR	MR	HR	VHR	VHR

H- HIGH, L- LOW, M-MEDIUM, R-RISK, V-VERY, (Source: Singh and Anbalagan 2001)

Table 18: Sample Risk Analysis at Union Council

Serial	Village Name	Hazard Probability-HP	Damage Potential -DP	Risk= (HP x DP)
1	aaa	H-HP	H-DP	HR
2	bbb	L-HP	H-DP	MR
3	ccc	VH-HP	VL-DP	LR
4	ddd	VH-HP	H-DP	VHR

VHR= Very High Risk, HR= High Risk, MR= Medium Risk, LR= low Risk, VLR= Very Low Risk

5. Risk Evaluation

The final step which follows after the risk analysis is risk evaluation. Its foremost purpose is to decide and plan the future strategies that should be followed for reducing the disaster risks present in the community. This is done by prioritizing various hazard risks which are or

which in future can put the community at risk. Moreover, risk evaluation is also useful in prioritizing or ranking the most vulnerable locality, municipality area or community. The information obtained through whole the aforesaid process form basis of such decisions made during risk evaluation. At risk communities along with local authorities can jointly agree on criteria to prioritize the risks and actions. For example, deciding on acceptable levels of risk on which no action is required or what priority actions are needed for the risks which are ranked as very high or high are discussed and agreed during the evaluation process.

Further Reading and References

- *What is VCA? An introduction to vulnerability and capacity assessment- IFRC*
- *Community-based Disaster Risk Management for Local Authorities- Participants Work Book- ADPC*
- *Asian Disaster Preparedness Center Thailand (2011); Participant's workbook on "Community Based Disaster Risk Reduction" available at www.adpc.net*
- *National Disaster Management Authority Islamabad Pakistan (2019); CBDRM training toolkit available at http://www.ndma.gov.pk/publications/Participants'%20Workbook%20-%20Urdu.pdf.*
- *World Food Program Islamabad Pakistan (2011); training manual on "Community Based Disaster Risk Management".*
- *Provincial Disaster Management Authority Khyber Pakhtunkhwa (2014-15); Participant's workbook on "Community Based Disaster Risk Management".*
- *National Disaster Management Authority Islamabad Pakistan (2012); "Instructor's Guidelines on Community Based Disaster Risk Management", published under the NDMP Vol-III.*

Unit 5.3

Name:	**Disaster Risk Reduction-DRR Planning at Community Level (Need and Importance)**
Learning Objective:	-To learn disaster risk reduction DRR planning process and steps -To understand the need and importance of DRR planning at village and union council levels
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia, cards, flip charts, markers, white board and markers
Training Techniques:	Plenary, interactive discussion, audio visual aids, group work, group presentation and Q/A

1. Disaster Risk Reduction DR Plan

A plan can be defined as a blueprint, road map, or guide in transforming at-risk communities to become a disaster-resilient community. It helps in the community's progression towards achieving safety, disaster resilience & sustainable development.

2. DRR Planning Process

Participatory disaster risk assessment includes thoroughly assessing and analyzing hazards, vulnerabilities and capacities in a community, while devising strategies in shape of concrete action plan to minimize the risk faced is known as risk reduction planning. During the planning process the affected communities together with outsiders (Experts) mutually plans and agree to identify pre, during and post disaster risk reduction measures. The presence of outside assistance in form of DRR experts may be important to initiate the process and train communities, however it not mandatory. The communities if trained usually can undertake planning very efficiently on their own. The prime objective of preparing disaster risk reduction plan at community level is to identify practical measures to reduce the risks in response to identified hazards or potential hazards, secondary hazards, different types of vulnerability conditions in the community while keeping in mind available capacities and resources that can be utilized in reducing disaster risk.

As we have learned in the previous sessions that disaster risk only occur if there is an intersection between impacts or an event (hazard) and vulnerabilities of people and community, known as dimensions of risk. Therefore, analyzing both the dimensions is equally important while considering risk reduction strategies. The risk reduction options available during planning process are, either to mitigate the risk or prevent it all together. However, as it is a participatory process therefore, during the planning process it is essential to integrate the inputs from the whole community through village disaster management committees. There is no dearth of local indigenous knowledge to cope with disasters within communities, therefore, during every stage of planning process their decisions and choices should heard and integrated within the plan.

3. Importance of Preparing DRR Plans at Village and Union Council Level

The promulgations of NDM Act in 2010 and an increase in frequency and severity of hazardous events, especially hydro-metrological hazards necessitated making the communities across Pakistan resilient. The government realizes that communities who are at the forefront and in direct path of hazards usually bear the brunt, the situation is further exacerbated by the presence of various vulnerability enhancing factor. Therefore, during the last decade a lot of work has been done by Government, United Nations and INGOs with regards to disaster risk reduction. Tremendous progress has been achieved by establishing a pro-active Disaster Risk Management System in the country. Disaster Risk Management and Reduction plans have been developed at National, Provincial and District levels with the technical assistance of local or foreign experts e.g. the national disaster response plan was made by JICA. Although, plans made by experts from outside played a vital role in identifying

strategic direction and practical measures based on best practices from the field, however they remained unsuccessful in accurately representing the ways in which communities are impacted and the vulnerability conditions present at community levels, the level which is at the receiving end. Notwithstanding the presence of relatively robust institutional arrangements at national and sub-national levels, the disaster losses have persistently increased over the years.

Therefore, now the government along with experts recognizes that for developing disaster resilient communities working together at community level in a strategic way to realistically identify the risks, while utilizing local resources to reduce the exposure and minimize vulnerabilities is the best option to make communities safe, self-reliant and resilient.

4. Suggested Outline of DRR Plans

DRR planning is very effective and meaningful when prepared jointly by the CBDRM experts/outsiders, local level committee members, community representatives and volunteers. It is advisable that the community together with the outsiders should develop a DRR plan in the form of written document which provide guiding principles during the implementation, monitoring and evaluation stages. The possible outline for both level plans can be the following;

- Description of village/union council including location, geography, geology, population distribution, climate, socio-economic characteristics and sources of livelihood etc.;
- Risk profile and summary of the participatory risk assessment findings;
- Risk reduction strategies and activities at village/union council levels;
- Roles and responsibilities of people, committees and volunteers involved;
- Schedules and timelines of the proposed activities;
- Annexes include;
    - Maps, tables, and matrices from the participatory risk assessment and DRR planning
    - List of community residents, directory of organizations and important local government and media contacts, list of members of the community disaster response organization,
    - Inventory of vital community resources for the preparedness activities
    - Operational procedures and policies such as procedures in canvassing, stockpiling and inventory; reporting requirements and formats; use and replenishment of the community contingency fund
    - Details of tasks of the various committees
    - Evacuation procedures and route and procedures in management of the evacuation center and/or Emergency Operations Center etc.

Further Reading and References

- *Asian Disaster Preparedness Center Thailand (2011); Participant's workbook on "Community Based Disaster Risk Reduction" available at www.adpc.net*
- *National Disaster Management Authority Islamabad Pakistan (2019); CBDRM training toolkit available at http://www.ndma.gov.pk/publications/Participants'%20Workbook%20-%20Urdu.pdf.*
- *World Food Program Islamabad Pakistan (2011); training manual on "Community Based Disaster Risk Management".*
- *Provincial Disaster Management Authority Khyber Pakhtunkhwa (2014-15); Participant's workbook on "Community Based Disaster Risk Management".*
- *National Disaster Management Authority Islamabad Pakistan (2012); "Instructor's Guidelines on Community Based Disaster Risk Management", published under the NDMP Vol-III.*

Module-6

Hazard Specific Community Based Disaster Risk Mitigation Measures

Unit 6.1:	An Overview of risk mitigation measures including structural and non-structural measures
Unit 6.2:	Hazard specific mitigation measures (Flood, Cyclone, Tsunami and Sea Intrusion etc.)

Outcomes

Upon completion of this Module you will be able to:

- Understand the concept of risk mitigation during participatory DRR planning process at community level
- Get familiar with various structural and non-structural mitigation measures
- Recognize and Know hazard specific mitigation measures for different hazards at community level

Unit 6.1

Name:	**An overview of risk mitigation measures including structural and non-structural measures**
Learning Objective:	-To understand the concept of risk mitigation during participatory DRR planning process -To know various structural and non-structural mitigation measures
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Laptop with the multimedia, meta-cards, flip charts, permanent markers, white board and erasable markers
Training Techniques:	PPT slides, sharing different photos of structural and non-structural measures from different regions followed with the interactive discussion and O/A at the end

1. Introduction

In the previous units, we learned about the details of participatory disaster risk assessment and disaster risk reduction planning process. This unit will help us in understanding the term mitigation as an option to minimize various identified risks and the structural and non-structural options available. During the process of DRR planning various risk reduction options emerge as a result of participation and inclusion of community members. These risk reduction options primarily consist of measure which can mitigate and prevent risk; however, in order to accomplish both i.e. mitigation and prevention, preparedness plays fundamental role. Therefore, for ease of understanding we can say that the disaster risk reduction planning process consists of measure which can prevent and mitigate the risk faced by the communities and it also describes the required preparedness steps for both.

2. Prevention

Prevention can be considered as complete avoidance of adverse impacts of hazards and associated risks. It means to stop the disasters from occurring or to completely get away from the direct path of hazard, which is generally not possible, especially in case of natural hazards. For example, we cannot stop an earthquake from happening and enough prior warning doesn't exist. Similarly, it is not easy to leave inherited ancestral lands due to threat of floods and the fishing communities cannot dispense with their livelihood options due to risks in open seas.

3. Mitigation

Mitigation refers to such measures that can be taken prior to the impact of a disaster to minimize the impact. The word Mitigation is more appealing when we are talking about natural hazards as we can't stop the disaster from occurring. However, we can try to reduce the consequences by taking certain steps like building flood bunds, raising the level of houses and stockpile food and water etc. These risk mitigation measures help communities in reducing the consequences by neutralizing the severity of impact of a given hazard and by providing protection against the adverse impacts. Broadly these measures can be divided into following two types;

3.1. Structural measures

They include permanent and semi-permanent man-made structures like levees, dikes, flood bunds and also include temporary barrier of sand bags. Other types of long term structural intervention are construction of river dams and reservoirs to harness the flow of rivers, as well as other strategies built to alter the path, natural force and impact of water flow. In addition, construction of physical infrastructures according to building codes to make them earthquake resilient or raising the foundations to cater for the flood waters are all considered as structural mitigation measures.

3.2. Non Structural measures

Non-structural risk reduction measures include those measures which directly do not neutralize the severity and force of impact but offer safety and protection against the adverse impacts. They include setting up DRR institutional arrangements, making policy and enacting DRR laws, efforts to implement building by laws or fire prevention measures, capacity building, trainings, awareness raising, drills, simulations etc. Sometimes, certain building accessories like windows, glasses, doors, ceiling, tiles etc. are also considered as non-structural component of a building.

It is important to consider both structural and non-structural activities during risk reduction planning. Both are equally important as they complement each other. For instance, we cannot make earthquake or flood resilient house according to the government approved building codes without knowledge and awareness. Awareness on living safely in hazard prone area is needed by family members living in the house. The awareness can be given through training, drills, simulation exercises and properly fixing the non-structural accessories and fixtures inside house.

4. Distinction Between Prevention and Mitigations

As described earlier, the term prevention implies complete avoidance of adverse impacts of hazards and associated risks. It means to stop the disasters from occurring or to completely get away from the direct path of hazard. While disaster risks mitigation means making the event smaller and reducing its harmful effects. Prevention activities are usually undertaken before an event happens, with an aim to either stop the event from happening, or to get out of its direct path. However, mitigation is considered once preventing hazard is not an option. The mitigation measures are designed to make the event less severe and its impact less harmful.

5. Preparedness

Technically experts describe preparedness as the knowledge and capacities developed by the governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions. For the purpose of clarity, the preparedness can be considered as a non-structural measure, therefore, as a sub component of the mitigation measures. Nonetheless, preparedness on itself is one of the important components of disaster risk reduction required to create awareness in communities about the harmful consequences of the disaster and support in developing disaster resilient communities.

Further Reading and References

- *United National International Strategy for Disaster Reduction 2009; UNISDR's terminologies on disaster risk reduction; available at https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf*
- *Participant's workbook on "Community Based Disaster Risk Reduction", Asian Disaster Preparedness Center found at www.adpc.net (2011), Bangkok Thailand.*

Unit 6.2

Name:	**Hazard specific mitigation measures (Flood, Cyclone, Tsunami and Sea Intrusion)**
Learning Objective:	To know various hazard specific mitigation options as structural and non-structural structures for DRR measures at the community level
Handout(s):	Reading material hard and soft copy and PP Slides
Training Material:	Multimedia and Laptop, cards, flip charts, permanent markers, white board and erasable markers
Training Techniques:	PPT slides, interactive discussion, learning from local experiences, Q/A

1. Introduction

In the previous unit, we discussed about disaster risk reduction measures and learned the difference between prevention, mitigation, structural and non-structural measures and preparedness etc. Now in this unit, we will concentrate on discussing hazard specific risk mitigation measures designed specifically for flood, cyclone, tsunami and sea intrusions as these are most common hazards in Sindh Province.

2. Flood Hazard Mitigation Measures

We are aware that the Floods in Sindh Province result in colossal damages every year. The types of floods that exist in Sindh Province are riverine, flash, urban and sometimes flooding of areas along the sea coast also occurs due to tropical cyclone and tsunami. It is difficult to apply a single approach for all types of floods. A wide range of mitigation measures which extend from development and enforcement of policies for land use planning and engineering work to development of flood forecasts, warnings, awareness raising, and preparedness and response. However, it is important to involve the affected communities and integrate community risk assessment and DRR plan within the overall mitigation strategies by the government. This aspect ensures community participation and sustainability measures. Below are some of the community based structural and non-structural measures that can be adopted for flood hazard mitigation.

2.1. Flood Structural Mitigation Measures

At community level these include construction of dykes, embankments, reservoir, check dams, shelter place and afforestation etc. while at household level; safer construction of houses, hazard resistant design (flood proofing) like blocking up of certain entrances, use of shields to seal doors, use of sand bags, removing damageable goods to higher level, greasing of equipment etc. and construction of houses away from flood prone low lying areas.

2.2. Flood Non-Structural Mitigation Measures

These include flood risk assessment, formation of flood disaster response committees, formation of flood fighting committees, conducting training and simulation exercises, initiating risk transfer mechanism at community level i.e. flood insurance of house, boat, crops etc. Identification of safer routes for evacuation and to arrange emergency response kits at community level, stockpiling food and water etc. At the activities may include household level proper fixing of assets like TV, refrigerators, ceiling, electric wire, provision of training and taking part in community drills and knowing the community response plan.

3. Cyclone Hazard Mitigation Measures

Tropical Cyclone is another natural hazard occasionally occurring during summers in the coastal districts of Sindh districts including Badin, Tharparkar, Sajawal, Thatta and Karachi.

Many cyclones have been threatening out coastal communities in recent years, due to climate change frequent cyclones originate in the Arabian Sea and Persian Gulf, although most of them are weak once they reach in close proximity of our coastline however, some have caused considerable losses due to accompanying heavy rainfall and flooding. Below are some of the community based structural and non-structural measures that can be adopted for cyclone hazard risk mitigation.

3.1. Cyclone structural Mitigation Measures

The proposed structural measures include bio-shield a term which means using natural plantation of mangrove along the coastal areas, sea wall and embankments, cyclone shelters, early warning system and communication etc. at community levels, while at household level; cyclone resistant housing, hazard resistant design (cyclone and flood proofing) like blocking up of certain entrances, use of shields to seal doors, use of sand bags, removing damageable goods to higher level, greasing of equipment etc. and construct houses either away from the cyclone prone areas or at least construct houses in the direction of wind to avoid heavy destruction.

3.2. Cyclone Non-structural Mitigation Measures

These include cyclone risk assessment, public awareness and community preparedness, capacity building and training, coastal regulations and zonation, maintaining natural sand dunes, evacuation drills, community level contingency planning, identifying safer routes for evacuation and arranging emergency response kits at community level. While at household level proper fixing of assets like ceiling, glasses with transparent sheets, provision of training, take part in community drills and knowing community emergency plans etc.

4. Tsunami hazard mitigation measures

Although, Tsunami do not pose a higher risk to coastal communities in Sindh province, however, situated near the active fault zone situated in Gujrat India and further near to Makran Subduction zone in Pakistan part of Arabian sea, Karachi and other coastal areas are considered at high risk of an earthquake and also Tsunami hazard. One of the major Tsunami which occurred during 1945 and another due to due to Bhuj-Gujrat earthquake in 2001. Below are some of the community based structural and non-structural measures that can be adopted for tsunami hazard mitigation.

4.1. Tsunami Structural and Non-Structural Measures

In order to reduce the impacts of tsunami before it reaches to the shoreline we can construct barriers to refrain the high waves known as revetments or groynes along the shoreline in front of those villages that are at risk. Rock groynes are generally preferred as they are more durable and absorb more wave energy due to their permeable nature. Natural bio-shield including mangrove plantation and preparing community shelters, community early warning system etc. at community level. While at household level we can create early warning system, create awareness on early evacuation to shelters with training etc.

5. Sea Intrusion Hazard Mitigation Measures

Sea intrusion has become a regular phenomenon in coastal areas of Sindh Province, especially in Badin, Thatta and Karachi coastal areas. District Badin is especially regarded as one of the coastal districts of Sindh which has badly suffered from the sea water intrusion. A latest research indicates that Indus River use to throw 400 million tons of silt in the sea every year, which has now been reduced to just about 100 million tons a year. This gradual depletion in out flow of freshwater and rich silt into the sea has not only slowed down delta formation, but has accelerated sea intrusion and led to hyper-saline condition in the coastal areas that is degrading the natural resources like, land, livestock, vegetation, fish, mangroves, and other edible marine varieties in the sea. Moreover, the shortage of fresh water together with seawater intrusion is consistently changing the geo-morphology of the region as well as forcing the coastal communities to shift their livelihoods. Therefore, if risk is not properly managed in time it may transform into disaster, resulting in total destruction of environments and the coastal communities.

5.1. Sea Intrusion-Structural and Non-Structural Measures

As for as structural measures are concerned, much of efforts remain to managed aquifer recharge which is one of the best suited methods for mitigating seawater intrusion. Further Infiltration galleries and scavenger wells can be constructed to control pumping based saltwater intrusion in coastal aquifers. Improvement in operation and safeguarding of the water supply system and reduction in wastage of water through leakage and illegal tapping, desalination plant and underground water storage reservoirs are the structural solution to be implemented in coastal areas of Sindh Province. However, it requires widespread efforts, huge investment and can be a long term sustainable solution.

As for was non-structural measures are concerned, activities like growth of salt tolerant crop varieties, introduce latest soil reclamation technology and set reverse osmosis plants or salt water desalinization plants and rainwater harvesting technology can be proposed along the Sindh coast to enhance social and economic conditions of local population.

Further Reading and References

- *APELL and Floods A community-based approach for disaster reduction by UNESCO and ENEP available at http://unesdoc.unesco.org/images/0013/001378/137828e.pdf.*
- *International Journal of Oceans and Oceanography, Volume 10, Number 2 (2016), Structural and Nonstructural mitigation measures in coastal area threats https://www.ripublication.com/ijoo16/ijoov10n2_06.pdf; pp. 141-148;*
- *Disaster Preparedness Portal; available at https://disasterpreparednesscourse.com/disaster-hazards/cyclones-tropical/cyclones-tropical-mitigation-actions-before-during-after/#tab-2*
- *Provincial Disaster Management Authority Sindh, available at http://www.pdma.gos.pk/new/Preparedness/guidlines.php*

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