Disaster Risk Management

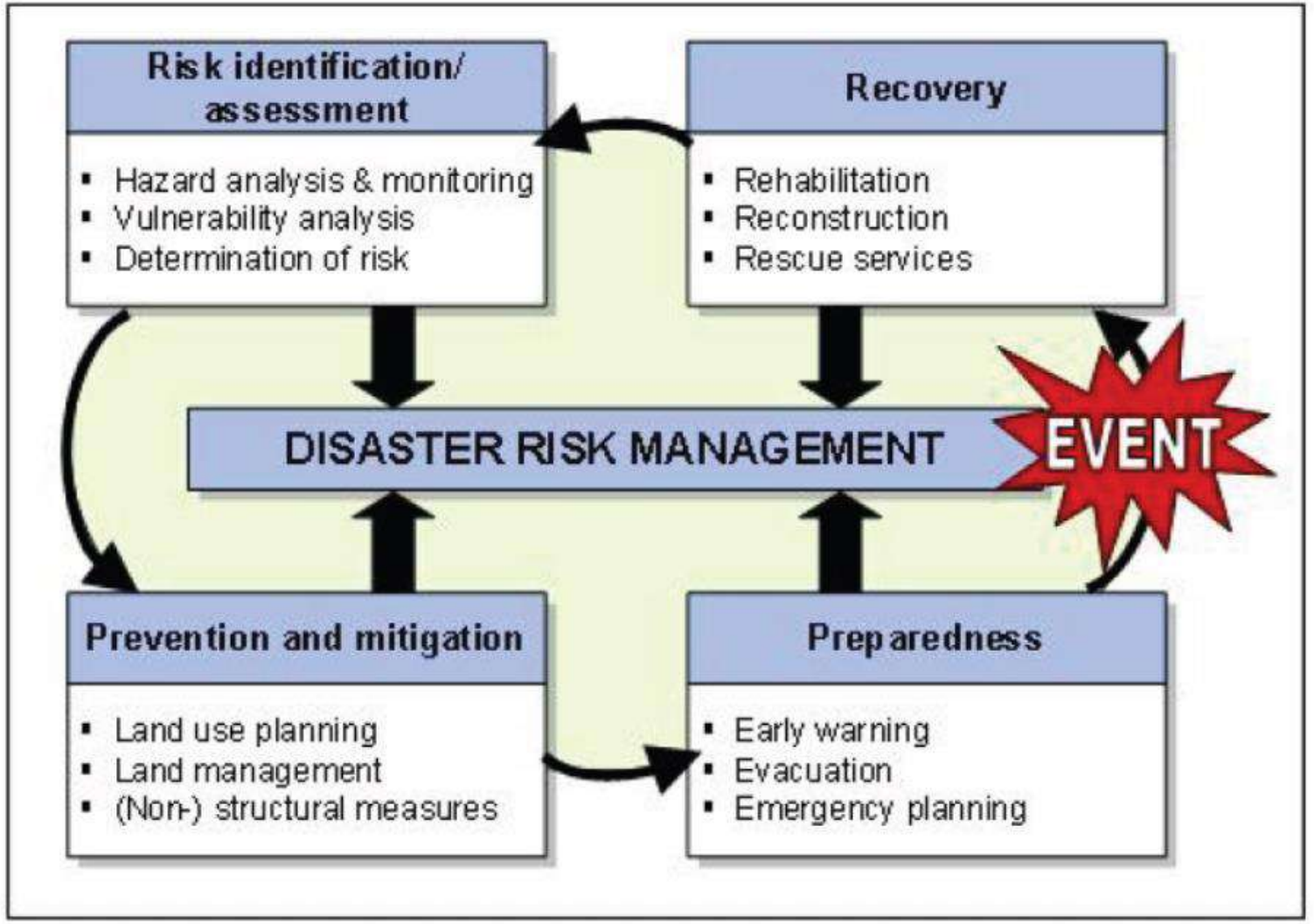
- **Definition of Disaster Risk Management (DRM)**

- The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

- Various frameworks have been proposed to understand the phases and process of disaster risk management.

- **Disaster Risk Management Framework**

In this framework, the disaster risk management process (cycle) comprises the following main elements:



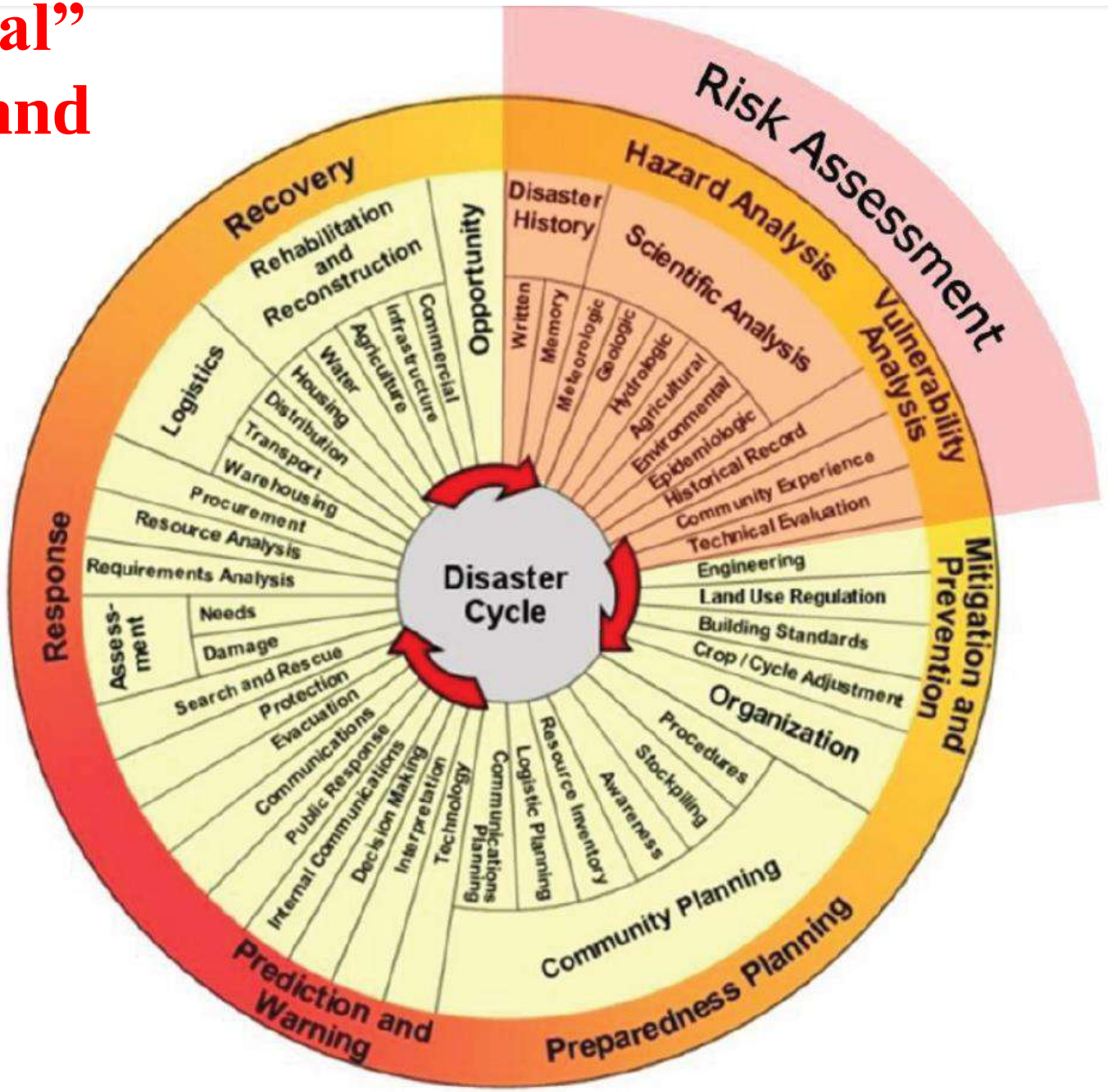
- Risk identification and assessment: This involves determining and analysing the potential, origin, characteristics and behaviour of the hazard.
- Application of risk reduction measures in mitigation: Planning and implementation of structural interventions or nonstructural measures such as disaster legislation.
- Disaster preparedness and emergency management: Activities and measures taken in advance to ensure effective response to the impact of a hazard, including measures related to timely and effective warnings as well as evacuation and emergency planning.
- Recovery/Reconstruction: Decisions and actions taken in the post-disaster phase with a view to restoring the living conditions of the affected population.

- This Disaster Risk Management frameworkhas several alternatives.

- In one of the alternatives, as shown in next slide, the disaster cycle is at the core and encompasses the usual elements of disaster risk management.

- Each of the core elements has been expanded to show most of the factors that are not easily discernible at the macro-scale.

The “traditional” disaster cycle and the role of risk assessment



- **Disaster Risk Reduction (DRR)**

- The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

- DRR is limited in scope compared with DRM, which combines prevention, mitigation and preparedness with response.

- Given the importance of DRR in the international policy arena, five (5) priority areas are underscored in the Hyogo Framework for Action (2005-2015):

1. Governance

2. Risk identification, assessment, monitoring and early warning

3. Knowledge management and education

4. Reducing underlying risk factors

5. Preparedness for effective response and recovery

- The Hyogo framework for action was succeeded by the Sendai Framework for Disaster Risk Reduction 2015-2030 at the Third United Nations World Conference on DRR which took place in March 2015 in Sendai, Japan.
- *The four (4) cornerstones of Disaster Risk Reduction*

Four parallel and complementary lines of actions can be considered to reduce exposure to disasters and achieve a more sustainable approach to development:

1. Community / stakeholder participation
2. Public policy actions
3. Safer construction and urban development
4. Development of a culture of prevention

Disaster Mitigation

- **Disaster mitigation** refers to the lessening or limitation of the adverse impacts of hazards and related disasters.

- The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions.

- Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness.

- **Primary Objectives of Disaster Mitigation**

The primary objectives of disaster mitigation are two fold,

➢ **Hazard likelihood reduction:**

- Appropriate for a few natural hazards, as it is not possible to reduce the occurrence of many hazards.
- However, the likelihood of floods occurrence can be reduced by mitigation measures such as sea defence walls.

➢ Risk consequence reduction:

- This is a reduction in the impact of a hazard, via a reduction in exposure and/or vulnerability.
- It involves ensuring that the population, structures, or other systems are able to withstand such an event with as few negative consequences as possible.

The primary aim in both is to decrease risk of death and injury to the population and the secondary aims are to decrease damage and economic losses inflicted on public sector infrastructure and to reduce private sector losses.

Types of Disaster Mitigation Measures

- Structural Mitigation Measures: Any physical construction to reduce or avoid possible impacts of hazards, which includes engineering measures and construction of hazard resistant and protective structures and infrastructure.

- Non-structural Mitigation Measures: This refers to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts.

- *Structural and non-structural disaster mitigation measures are mainly carried out by human beings.*

- *However, nature through ecosystem functions also provides several mitigation measures as shown in next slide.*

Hazard and disaster mitigation functions of ecosystems

Ecosystem	Hazard Mitigation
Mountain forests, vegetation on hillsides	Vegetation cover and root structures protect against erosion and increase slope stability by binding soil together, preventing landslides. Catchment forests, especially primary forests, reduce risk of floods by increasing infiltration of rainfall and delaying peak floodwater flows, except when soils are fully Saturated. Forests on watersheds are important for water recharge and purification, drought mitigation and safeguarding drinking water supply.

Hazard and disaster mitigation functions of ecosystems

Ecosystem	Hazard Mitigation
Wetlands, floodplains	Wetlands and floodplains control floods in coastal areas. Marshes, lakes and floodplains release wet season flows slowly during drought periods.
Coastal ecosystems (mangroves, saltmarshes, coral reefs, sand dunes)	Coastal wetlands, tidal flats, deltas and estuaries reduce the height and speed of storm surges and tidal waves. Coastal ecosystems protect against storm surges, flooding and other coastal hazards – combined protection by coral reefs, seagrass beds and sand dunes/ coastal wetlands/coastal forests is particularly effective.

Hazard and disaster mitigation functions of ecosystems

Ecosystem	Hazard Mitigation
Drylands	Natural vegetation management and restoration in drylands contributes to ameliorate the effects of drought and control desertification, as trees, grasses and shrubs conserve soil and retain moisture. Prescribed burning and creation of physical firebreaks in dry landscapes reduce fuel loads and the risk of unwanted large-scale fires.

Disaster Preparedness

- **Disaster preparedness** encompasses the knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions

- Components of a Comprehensive Disaster Preparedness Strategy

- Hazard, risk and vulnerability assessments
- Response mechanisms and strategies
- Preparedness plans
- Coordination
- Information management
- Early warning systems
- Resource mobilisation
- Public education, training & rehearsals
- Community-based disaster preparedness

- Types of Disaster Preparedness

- *Target-Oriented Preparedness*: Preparedness plans may be target specific, for instance, we may require different types of planning for the vulnerable groups of women, children, elderly and disabled.
- *Task-Oriented Preparedness*: Specific groups jointly develop activities based on one of the community's plans to evaluate the community's capability to activate the preparedness plan in a real emergency. Eventually, these tasks enable the development of plan revisions, employee training and material resources to support readiness.

- Types of Disaster Preparedness

- *Disaster-Oriented Preparedness*: This addresses the likelihood of occurrence of a specific disaster. Emphasis is placed on structural and non-structural mechanisms.

Various levels of disaster preparedness in case of flooding is shown below:

Triggers	Early warning monitoring indicators	Responsible for early warning	Preventive and mitigating measures
Heavy rains	1) Weather forecasts 2) Information flow on the rainy season 3) Observation of the rise of river level	1) Gmet 2) Ministry of Information 3) NADMO	1) Use of media 2) Desilting of drainage systems 3) Clearing of waterways 4) Timely evacuation of population 5) Timely information flow on the rainy season
Opening of dams	1) Alert warning from Burkina Faso on the opening of dams 2) Rise of the water level in Burkina Faso	1) Volta River Authority 2) Ministry of Information 3) Ministry of Foreign Affairs 4) Ministry of Interior 5) NADMO 6) District Municipal and Metropolitan Assemblies	1) Timely flow of information on the opening of dams 2) Use of media 3) Use of voluntary groups by NADMO and red Cross 4) Evacuation plans and identification plans and identification of safer places
Choked drainage systems	1) Increment in human activities due to population increase resulting in unplanned settlements 2) No existing waste disposal sites	1) EPA 2) District and Metropolitan Assemblies 3) Ministry of Works and Housing	1) Establishment of an authority in charge of waste management 2) Clean up of drainage systems by District Assemblies

- Disaster preparedness provides a platform to design effective, realistic and coordinated planning, reduces duplication of efforts and increase the overall effectiveness of government, household and community member’s disaster preparedness efforts.
- Disaster preparedness activities embedded with risk reduction measures can prevent disaster situations and also result in saving lives and livelihoods during any disaster situation, enabling the affected population to get back to normalcy within a short time period.
- Disaster preparedness is a continuous and integrated process resulting from a wide range of risk reduction activities and resources rather than from a distinct sectoral activity by itself.

Disaster Prevention

- Disaster Prevention is defined as those activities taken to prevent a natural phenomenon or potential hazard from having harmful effects on either people or economic assets.

- It refers to measures taken to eliminate the root causes that make people vulnerable to disaster.

- For disaster prevention to be successful, *a priori* planning is required.

- Planning of prevention hinges on two issues:

- hazard identification (identifying the actual threats facing a community) and

- vulnerability assessment (evaluating the risk and capacity of a community to handle the consequences of the disaster).

- Once these issues are put in order of priority, emergency managers can determine the appropriate prevention strategies.

- Natural hazards cannot be prevented
- Human-made hazards can be prevented.
- Prevention has more to do with prohibiting man-made hazards.
- However, mitigation and preparedness are considered as key measures of risk reduction for natural hazards.

- **Types of Disaster Prevention**

- Either primary or secondary.
- **Primary prevention** is to reduce, avert or avoid the risk of the event occurring, by getting rid of the hazard or vulnerability, e.g. to avoid overcrowding, deforestation, choked drainage and to provide services.
- **Secondary prevention** means to recognize promptly the event and to reduce its effects, e.g. by staying alert to possible displacements of population; by being ready to provide immunization, food, clean water, sanitation and health care to the affected population.

Disaster Response

- **Disaster responses** are the set of activities taken during a disaster or immediately following a disaster, directed towards saving life and protecting property.

- The activities that deal with the effect of disaster may include medical care, evacuation, search and rescue, provision of emergency water, food and shelter, debris removal and stabilization of unsafe buildings and landforms.

- **The Objectives of Disaster Response**

- It is aimed at providing immediate assistance to maintain life, improve health and support the morale of the affected population.

- It is focused at meeting the basic needs of the people until more permanent and sustainable solutions can be found.

- It depends on the adequacy of preparedness.

- **The Objectives of Disaster Response**

- The success in responding appropriately depends on early planning, organisation and training.

- Disaster response preparedness are the pre-disaster activities that are undertaken to minimise loss of life, injury and property damage in a disaster, and to ensure that rescue, relief, rehabilitation and other services can be provided following a disaster.

- Preparedness for the first and immediate response is referred to as “emergency preparedness”.

- **Factors that Determine the Nature of Disaster Response**
- *The type of disaster:* Disaster manifests in many forms, its onset may provide long warning, short warning, or no warning at all. It would influence the effectiveness of activating preparedness plans, mobilisation, and application or response effort.
- *The ability to take pre-impact actions:* Responses to disaster are operationalized in three main phases namely the “pre-, during and post-disaster” situation. Disaster early warning systems may provide timely warnings for anticipating impending disaster. Pre-impact responses may be carried out if time and conditions are favourable.

- **Factors that Determine the Nature of Disaster Response**
- *The severity and magnitude of disaster:* The severity and size of the problem determines the response required. Particular effects could be seen in the ability of responses to cope with the problem.
- *The capability of sustained operations:* This is influenced by factors such as resource capability, management capability, community self-reliance, and availability of international assistance. It is important that these issues are clearly addressed in preparedness planning and response action plans.

- **Factors that Determine the Nature of Disaster Response**
- *Identification of likely response requirements:* It is to be identified in the preparedness planning stage. The characteristics of disaster events might result in some or all of the following:

➢ Many urgent and significant tasks involving injuries, deaths, or property loss/damage.
➢ Large numbers of personnel and agencies required.
➢ High levels of public interest and/or controversy.
➢ Many examples of information mishandling.
➢ Potential for some key tasks to be overlooked, under-resourced, over-resourced.
➢ Potential for some of the available key resources to not be used.

- **Requirement for Effective Response**

➢ *Information:* An early warning system provides vital information for effective response operation. It must be robust to transmit warnings as early as practicable. Information gained from these systems could help in the planning and decision-making as well as inform the general public.

- **Requirement for Effective Response**

➢ Resources: It form an essential component of disaster response. The ability to mobilise the needed resources on short notice is most often hampered by many factors. The response plan as a component of the disaster management plan includes ways of managing human and financial resources, response to supplies availability and communication procedures. This involves identifying, strengthening, and organising resources and capacities for timely and effective response to a potential disaster.

- **Disaster Response Planning**

- In disaster response planning, roles and responsibilities are defined, policies and procedures are developed and generic tools for responses are identified and developed.

- Plans must be monitored, evaluated and adapted to the specific situation in times of disaster.

- **Rationale for Disaster Response**

Responses are mainly directed at:

- limiting casualties;
- alleviating hardship and suffering;
- restoring essential life support and community systems;
- mitigating further damage and loss; and
- providing the foundation for subsequent recovery.

- **The Humanitarian Charter**

The Humanitarian Charter provided 4 principles that must be followed in responding to emergencies based on the right to live in dignity, the right to receive humanitarian assistance, and the right to protection and security (The Sphere Project, 2011).

The principles are:

- avoid exposing people to further harm as a result of your actions;
- ensure people have access to impartial assistance;
- protect people from physical and psychological harm due to violence and coercion; and
- enable access to remedies and recovery from abuse (Sphere Handbook, 2012).

- **The Sphere Project** aims to improve the quality of assistance provided to people affected by disasters, and to improve the accountability of humanitarian actors to their constituents, donors and affected people. This Project has suggested 4 minimum standards that often need consideration during response to disasters.

These are:

1. water supply, sanitation and hygiene promotion;
2. food security and nutrition; and
3. shelter, settlement and non-food items; and
4. health action.

- **Disaster Responses**

Disaster responses include actions that embrace the following:

- Search and rescue
- First aid and emergency medical care
- Evacuation
- Evacuation centre management
- Development of Standard Operation Procedure (SOPs)
- Immediate repair of community facilities and services
- Relief delivery
- Coordination and Communication
- Psycho-social counselling and stress debriefing
- Medical services

- **Search and rescue**
- This activity is usually conducted by well-trained volunteers in finding disaster victims, that is, lost, sick or injured persons in either a remote or difficult to access areas such as water bodies, desert, forest or probably in the course of mass population movement.
- They are often directed at, locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility.

- **Basic Key Steps of Search and Rescue**

1. Size up - involves assessing the situation and determining what one is going to do and if yes, then how.

   The decision whether to attempt a rescue should be based on:

   a. The risks involved; and

   b. Achievement of the overall goal of doing the greatest good for the greatest number.

2. Search - involves locating victims and documenting their location.

3. Rescue - involves the procedures and methods of extricating and moving victims to safety.

- **First aid and emergency medical care**

- First aid is the provision of initial care for an illness or injury.
- It is usually performed by non-expert, but trained personnel to a sick or injured person until definitive medical treatment can be accessed.
- Emergency medical care is immediate paramedic attention to severe wounds and the rapid transportation of the ill or injured to a health facility.

- **Evacuation**

Evacuation is an organised movement of people from an area at risk to a safer place.

Types of Evacuation

- Precautionary evacuation before disaster
- Protective evacuation after disaster
- Evacuations for reconstruction purposes

- **Evacuation**

Services provided during evacuations include:

- Registration
- Assistance with financial and legal queries
- Water, food, clothing
- Rest areas
- Blankets and personal items
- Interpreter services
- Assistance in contacting family/friends
- Services for animals
- Emergency financial assistance
- First aid, medical and health
- Information

- **Standard Operating Procedures (SOPs)**
- SOPs are the set of standard procedures that "operationalize" the disaster response and/or contingency/ plans. The SOPs set out what should be done, how it should be done, who is responsible for implementing what, and specifies available resources.
- SOPs take cognisance of four stages of preparation and procedures:
  - during normal times
  - alert/warning and
  - during disaster
  - rehabilitation

❖ During Normal Times

The state institution mandated to respond to disaster ought to:

- Formulate and distribute disaster preparedness plans, and conduct drills in all areas;
- Produce maps of Wards/Village Tracts showing areas most vulnerable to storms, floods and other natural disasters;
- Make a list of vehicles and motor boats that can be used for emergency work;
- Compile a list of departments, non-governmental organisations (NGOs), and members of People's Strength that will take part in relief operations in the predisaster, disaster and post-disaster periods and designate representatives for contact;

❖ During Normal Times

- Obtain beforehand the required relief and aid supplies;
- Form the necessary disaster preparedness committees and organizations;
- Create shelters and safe locations for use during disasters depending on local conditions;
- Conduct educational talks on natural disasters and rehearse periodically for the local community depending on local conditions; and Coordinate with departments concerned to form Security services, Auxiliary Fire Brigades, communication agencies and Red Cross Societies; and
- Provide organising and training activities.

❖ Alert/Warning Stage

- Emphasize the dissemination of news obtained through early warning systems to the community;
- Assign duties to administrative bodies and NGOs to fly warning flags as part of the disaster preparedness programme in the vulnerable areas of the Ward/Village Tract;
- Alert and mobilise members of the Security services, Auxiliary Fire Brigade, communication agencies, the Red Cross, Youth, members of People's Strength and NGOs;

❖ Alert/Warning Stage

- Make the necessary arrangements to evacuate the public to safe locations (shelters) in a timely manner;
- Increase security sentries as required;
- Ensure that all levels of supervisors have all teams ready for assigned duties; and
- Keep the office operational 24 hours a day in the emergency period.

❖ During Disaster Stage

- Alert the community in areas the natural disaster is likely to strike;
- Safeguard the road and water transport routes, keep relief and medical teams at the ready and arrange transport to affected areas at short notice;
- Evacuate the community from vulnerable areas to safe locations or designated shelters as quickly as possible;
- Operate relief camps and supervisory centers at designated shelters as quickly as possible;
- Ensure that administrative personnel and NGOs in areas vulnerable to storms give disaster warnings door to door as a matter of urgency;

❖ During Disaster Stage

- Keep available relief and aid supplies at the ready to launch relief operations quickly and effectively;
- Evacuate the public remaining in the area to designated safe locations;
- Make arrangements to evacuate movable property including cattle to designated locations; and
- Ensure the well-disciplined implementation of orders received from the coordinating agencies and sub-committees with the help of members of the Security services, Fire Brigade, Red Cross Youth members, and members of People's Strength, social organisations and NGOs.

❖ Rehabilitation Stage

The SOPs for the rehabilitation stage are:

- Conduct field inspections in affected areas as soon as possible and provide the necessary assistance and support;
- Submit immediate preliminary reports with population figures, death and injury figures of cattle and animals, data on socio-economic losses, and carry out further systematic data collection;
- Make arrangements to provide health care and social protection to disaster victims;
- Clear collapsed buildings and trees as quickly as possible;
- Prioritise the restoration of transportation, electricity and water supply and telephone and telegraph services as soon as possible;

❖ Rehabilitation Stage

- Make arrangements as quickly as possible to reclaim contaminated wells and ponds for access to clean water and dig new wells for drinking water;
- Make arrangements to bury/cremate the remains of disaster casualties and animal carcasses;
- Manage and systematically utilise disaster funds and supplies, as well as cash and supplies donated by well-wishers, social organisations and NGOs; and
- Support the local population for the resumption and recovery of economic activities to previous conditions.

- **Relief Aid**

- This relates to any provision of assistance during an emergency that is meant to attend to a person's immediate requirements for survival or recovery.
- It may include food, clothing, housing, medical care, necessary social services and security when a person is faced with circumstances beyond her or his control.
- Relief aid must be targeted at the most vulnerable first: Vulnerable children or orphans, female or child headed households, pregnant or lactating women, sick or elderly populations.

- **Coordination and Communication**

- Meetings - Plan to hold regular meetings with Movement partners to determine activities and roles;
- Information management - Information sharing on disaster impact, assessment and needs through input into DMIS (Disaster Management Information System);
- Communication means - Plan for continuous information and communication flow; Movement Coordination Frame works - Plan for strategic and operational coordination; and
- Partnership agreements - Identify existing agreements and determine additional agreements needed to meet needs.

- **Coordination and Communication**

➢ Accurate and comprehensive information is often a requisite without which response operations would be difficult. The setting of Emergency Operations Centres (EOC) is essential for the effective management of information. EOCs ensure that information is correctly processed according to the proven cycle of:

- acquisition of information;
- information assessment;
- decision-making; and
- dissemination of decisions and information.

- **Psychosocial Support**

- Impacts on psychosocial well-being can be both short term and long term.
- Psychological services play a crucial role in responding to crises that involve large populations.
- They help in the recovery process and reduce the development of mental health problems.
- Psychosocial support activities include identifying and referring individuals requiring specialised support through professional mental health services.

- **Public Health Services**

The relevance of medical services is most felt in when there are:

- Deaths, injuries
- Loss of clean water, shelter, sanitation, routine hygiene
- Disruption of solid waste management
- Public concern for safety
- Increased pests and vectors
- Damage to health care system
- Worsening of chronic illnesses
- Toxic/hazardous exposure
- Loss of food supply
- Standing surface water

- **Public Health Services**

The public health services required in responding to disasters include:

- Mass casualty management
- Mental health
- Environmental health
- Reproductive health
- Managing and continuation of existing health services
- Managing and continuation of medication on chronically affected diseases (HIV, TB, Leprosy, etc.)
- Management of the dead and missing
- Emergency feeding
- Communicable disease surveillance and response
- Sanitation