TRAINING MODULE

Project

Virtual Cadre for Disaster Risk Reduction

Department

Animal Husbandry Department

Published by

Kerala State Disaster Management Authority

Technical Support

UNDP & SEEDS India

Empowered lives.
Resilient nations.

Version 1 | 2019

Published by

Kerala State Disaster Management Authority

Training Module
Animal Husbandry Department on Disaster Risk Reduction

Prepared under the
Virtual Cadre Project of KSDMA

Technical Support

UNDP & SEEDS India

Project Background

Kerala is prone to natural disasters and the changing climatic dynamics given its location along the seacoast and with a steep gradient along the slopes of the Western Ghats. The floods and landslides destroyed public and private infrastructure, including houses, roads, bridges, schools, health facilities, and other utility services and seriously influenced the production sectors. However, the recent floods in Kerala highlighted the need for a robust preparedness, response and recovery mechanism to mitigate impacts of disasters. Considering the vulnerability of the state to disasters, highlighted in the disaster management plan of the state, disaster preparedness assumes high priority. Building capacities of individuals and institutions goes a long way towards preparedness. There is a growing global consensus on the need to invest in disaster risk mitigation, with a focus on mainstreaming mitigation into sustainable development. Coastal states are particularly vulnerable to disasters due to growth of population in unsafe areas, climate change, environmental degradation and lack of local capacities. The Section 38(2) (g) of the Disaster Management Act mandates the preparation of departmental Disaster Management Plans and Section 39 to integrate measures of disaster preparedness and mitigation in developmental plans in accordance with the NDMA and SDMA guidelines. However, the departments do not have the needed expertise to prepare Disaster Management Plans and the Disaster mitigation concerns are not integrated in the developmental plans. The Virtual Cadre once full capacitated will be able to support the departments in doing the above-mentioned tasks. Keeping the above at forefront, UNDP is implementing the project titled “Capacity Development of Virtual Cadre Officials of Kerala.” The project is being implemented by SEEDS Technical Services Pvt. Ltd. The main objective is to build and strengthen the capacity of virtual cadre officials at state and district level for acting as champions in the area of disaster preparedness and management, eight departments of state government has been selected to provide training on different areas specific to their department in the context of any emergency. This study will involve both formative research to assess and identify training and capacity needs; and the creation of a framework, strategy and plan to effectively address those needs.

Objective

Develop capacities of the departmental virtual cadre of officials at district and state level to act as DRR champions.

Role definition for Virtual Cadre Officials for Disaster Management in Kerala

The Kerala State Disaster management Plan (SDMP) 2016 recommends that the State Government shall ensure that there is a professionally trained virtual cadre of officers in all the departments of the State for disaster management. The virtual cadre will principally be 15 selected individuals (one each in each district and one in the State level) with at least 20 years more of service left. The members of this virtual cadre shall be the departmental nodal officers for disaster management who shall be as individuals responsible for supporting the

district and state disaster management authorities in disaster management. The KSDMA will ensure that these individuals are adequately trained in matters related to disaster management. These officers shall be trained in rapid damage assessment and certification in the respective sector. The disaster-specific nodal departments through this virtual cadre will ensure liaison and coordination with KSDMA and DDMAs in the smooth implementation of the departmental disaster management plan and with SEOC and DEOCs for ensuring coordinated response to events.

Selected Departments of Kerala under the Project

Agriculture: Around 52% of Kerala's geographical area is under cultivation. Being the spice capital of India, Kerala accounts for 89% of total small cardamom and 98% of total nutmeg production in the country. The state also accounts for 34% of total pepper production. Agriculture along with livestock and fisheries contributes to 11% of the Gross State Value Addition (GVSA) at current prices. In Kerala, 17.15% of the population depends on agriculture. The lowest regions of midland plains host paddy fields and the elevated land slopes has rubber and fruit trees along with black pepper, tapioca and other crops. The coastal belt of Kerala is flat with paddy fields, coconut trees and by a network of interconnected canals and rivers.

Animal Husbandry: Around 8.8 million households in Kerala are involved in animal husbandry and nearly 94% of the livestock population is concentrated in rural areas. In the subsector of animal husbandry and dairy development, Alappuzha, Kottayam, Pathanamthitta, Ernakulam, and Thrissur districts suffered the most in the 2018 floods. The share of livestock in Kerala's GSVA is 3.84%.

Mining and Geology: Kerala State is endowed with a number of occurrences/deposits of minerals. The contribution of mining and quarrying sector to Gross State Value Added (GSVA) of Kerala at constant prices is estimated at ₹3,658 crore in 2017-18.

Minor Irrigation: Minor Irrigation departments lifts the schemes, that having a Cultivable Command Area (CCA) up to 2,000 ha. Minor irrigation scheme comprises of surface water schemes like minor irrigation tanks and canal systems, diversion weirs, lift irrigation schemes and sub-surface schemes.

Health: Kerala has made significant gains in health indices such as high life expectancy, low infant mortality rate, birth rate, and death rate. The health status of the marginalised communities like adivasis and fishing workers is also poor compared to that of the general population. Also, 70% of Kerala's healthcare is privately provided, which is making it expensive. In addition, the number of disaster incidents are increasing causing loss of lives and affects a large number of people.

Water Authority: The Kerala Water Authority (KWA) is the primary institution for the development and regulation of water supply and wastewater collection and disposal in Kerala. There are 1081 schemes under Kerala Water Authority in total and have a total installed capacity of 3468 MLD. The per capita availability through the KWA schemes is 176 LPCD.

Land Revenues: The largest department under the Government, with more than 19000 employees, also known as the “Mother of All Departments”. Some of the major functions of the department are collection of basic tax, plantation tax, building tax, etc., land/mineral conservancy, census, election, natural calamity operations, redressing grievances of citizens, law and order, distribution of social welfare pensions etc. Although this is also getting affected from the disasters occurred in the state. A total of 342 landslides occurred in the Revenue Department marked land extents.

Soil Conservation: This is one of the important department, which plan, promote, coordinate and oversee the implementation of soil and water conservation programmes with an aim to conserve the valuable resource trinity of soil, water and biomass in a sustainable manner ensuring active participation of all stakeholders.

Table of Contents

Chapter 1
Introduction to Disaster Management

What is disaster management?

We act before, during and after disasters strike, often helping in some of the world's most hostile environments. Our disaster management activities seek to:

1. Save lives and reduce human suffering
2. Protect and restore livelihoods
3. Reduce the risks faced by communities affected by disaster and conflict.

Disaster Management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies; in particular – mitigation, preparedness, response, and recovery in order to lessen the impact of disasters.[1]

Definition of Key Terms

Build back better

The use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment.

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.

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

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.

Contingency planning

A management process that analyses disaster risks and establishes arrangements in advance to enable timely, effective and appropriate responses. Contingency planning is an important part of overall preparedness. Contingency plans need to be regularly updated and exercised.

Annotation: Contingency planning results in organized and coordinated courses of action with clearly identified institutional roles and resources, information processes and operational arrangements for specific actors at times of need. Based on scenarios of possible emergency conditions or hazardous events, it allows key actors to envision, anticipate and solve problems that can arise during disasters.

Critical infrastructure

The physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society.

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.

Disaster management

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

Annotation: 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.

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, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.

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.

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.

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.

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.

Multi-hazard early warning systems

These systems address several hazards and/or impacts of similar or different type in contexts where hazardous events may occur alone, simultaneously, cascading or cumulatively over time, and considering the potential interrelated effects. A multi-hazard early warning system with the ability to warn of one or more hazards increases the efficiency and consistency of warnings through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring for multiple hazards.

Evacuation

Moving people and assets temporarily to safer places before, during or after the occurrence of a hazardous event in order to protect them.

Exposure

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

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.

Multi-hazard means (1) the selection of multiple major hazards that the country faces, and (2) the specific contexts where hazardous events may occur simultaneously, cascading or cumulatively over time, and considering the potential interrelated effects.

Hazards include (as mentioned in the Sendai Framework for Disaster Risk Reduction 2015-2030, and listed in alphabetical order) biological, environmental, geological, hydrometeorological and technological processes and phenomena.

Mitigation

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

Annotation: 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.

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.

Prevention

Activities and measures to avoid existing and new disaster risks.

Annotations: 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.

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.

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.

Rehabilitation

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

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.

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.

Annotation: Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief. Effective, efficient and timely response relies on disaster risk-informed preparedness measures, including the development of the response capacities of individuals, communities, organizations, countries and the international community.

Photograph © SEEDS/Siddharth Behl

Retrofitting

Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.

Annotation: Retrofitting requires consideration of the design and function of the structure, the stresses that the structure may be subject to from hazards or hazard scenarios and the practicality and costs of different retrofitting options. Examples of retrofitting include adding bracing to stiffen walls, reinforcing pillars, adding steel ties between walls and roofs, installing shutters on windows and improving the protection of important facilities and equipment.

Risk transfer

The process of formally or informally shifting the financial consequences of particular risks from one party to another, whereby a household, community, enterprise or State authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party.

Annotation: Insurance is a well-known form of risk transfer, where coverage of a risk is obtained from an insurer in exchange for ongoing premiums paid to the insurer. Risk transfer can occur informally within family and community networks where there are reciprocal expectations of mutual aid by means of gifts or credit, as well as formally, wherein governments, insurers, multilateral banks and other large risk-bearing entities establish mechanisms to help cope with losses in major events. Such mechanisms include insurance and reinsurance contracts, catastrophe bonds, contingent credit facilities and reserve funds, where the costs are covered by premiums, investor contributions, interest rates and past savings, respectively.

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, through policies and laws, public awareness raising, training and education.

Underlying disaster risk drivers

Processes or conditions, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity.

Annotation: Underlying disaster risk drivers — also referred to as underlying disaster risk factors — include poverty and inequality, climate change and variability, unplanned and rapid urbanization and the lack of disaster risk considerations in land management and environmental and natural resource management, as well as compounding factors such as

demographic change, non-disaster risk-informed policies, the lack of regulations and incentives for private disaster risk reduction investment, complex supply chains, the limited availability of technology, unsustainable uses of natural resources, declining ecosystems, pandemics and epidemics.

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.

History of Disaster Management in India

Disaster Management during British Administration and Post-Independence

During the British administration, relief departments were set up for emergencies during disasters. The policy was relief-oriented, and activities included designing the relief codes and initialising food for work programmes. Post-Independence, the task for managing disasters continued to rest with the Relief Commissioners in each state, who functioned under the Central Relief Commissioner, with their role limited to delegation of relief material and money.

Emergence of Institutional Arrangement in India

A permanent and institutionalised setup began in the decade of 1990s with set up of a disaster management cell under the Ministry of Agriculture. Following series of disasters such as Latur Earthquake (1993), Malpa Landslide (1994), Orissa Super Cyclone (1999) and Bhuj Earthquake (2001), a high powered Committee under the Chairmanship of Mr. J.C. Pant, Secretary, Ministry of Agriculture was constituted for drawing up a systematic, comprehensive and holistic approach towards disasters. There was a shift in policy from an approach of relief through financial aid to a holistic one for addressing disaster management. Consequently, the disaster management division was shifted under the Ministry of Home Affairs in 2002 vide Cabinet Secretariat's Notification No. DOC.CD-108/2002 dated 27/02/2002 and a hierarchical structure for disaster management evolved in India.

Present Structure for Disaster Management in India

The institutional structure for disaster management in India is in a state of transition. The National Disaster Management Authority has been established at the centre, and the SDMA at state and district authorities at district level are gradually being formalized. In addition to this, the National Crisis Management Committee, part of the earlier setup, also functions at the Centre. The nodal ministries, as identified for different disaster types of function under the overall guidance of the Ministry of Home Affairs (nodal ministry for disaster

management). This makes the stakeholders interact at different levels within the disaster management framework.

Within this transitional and evolving setup, two distinct features of the institutional structure for disaster management may be noticed. Firstly, the structure is hierarchical and functions at four levels – centre, state, district and local. In both the setups – one that existed prior to the implementation of the Act, and other that is being formalized post-implementation of the Act, there have existed institutionalized structures at the centre, state, district and local levels. Each preceding level guides the activities and decision making at the next level in hierarchy. Secondly, it is a multi-stakeholder setup, i.e., the structure draws involvement of various relevant ministries, government departments and administrative bodies.

Disaster Management Act, 2005

This Act provides for the effective management of disaster and for matters connected therewith or incidental thereto. It provides institutional mechanisms for drawing up and monitoring the implementation of the disaster management. The Act also ensures measures by the various wings of the Government for prevention and mitigation of disasters and prompt response to any disaster situation.

The Act provides for setting up of a National Disaster Management Authority (NDMA) under the Chairmanship of the Prime Minister, State Disaster Management Authorities (SDMAs) under the Chairmanship of the Chief Ministers, District Disaster Management Authorities (DDMAs) under the Chairmanship of Collectors/District Magistrates/Deputy Commissioners. The Act further provides for the constitution of different Executive Committee at national and state levels. Under its aegis, the National Institute of Disaster Management (NIDM) for capacity building and National Disaster Response Force (NDRF) for response purpose have been set up. It also mandates the concerned Ministries and Departments to draw up their own plans in accordance with the National Plan. The Act further contains the provisions for financial mechanisms such as creation of funds for response, National Disaster Mitigation Fund and similar funds at the state and district levels for the purpose of disaster management. The Act also provides specific roles to local bodies in disaster management.

Institutional Bodies

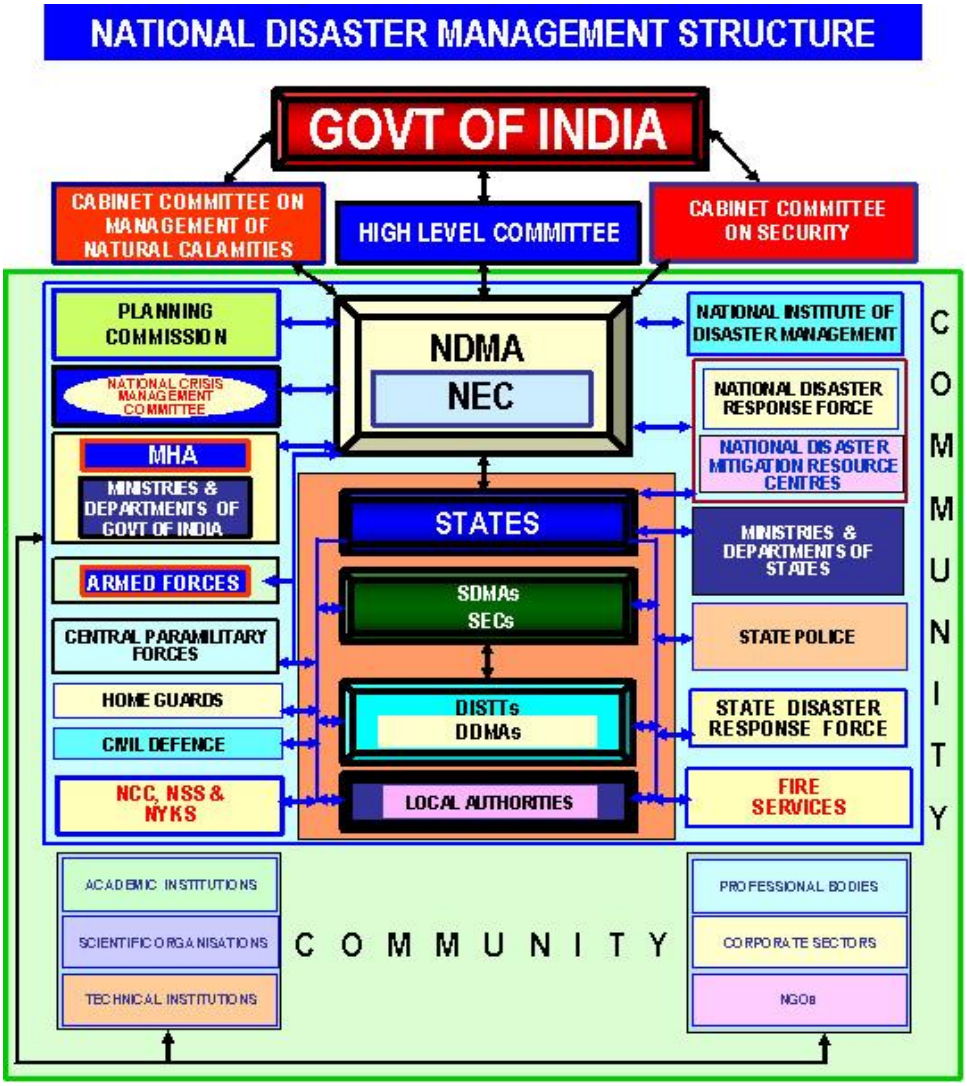
National Disaster Management Authority (NDMA)

The National Disaster Management Authority (NDMA) was initially constituted on May 30, 2005 under the Chairmanship of Prime Minister vide an executive order. Following enactment of the Disaster Management Act, 2005, the NDMA was formally constituted in accordance with Section-3(1) of the Act on 27th September 2006 with Prime Minister as its Chairperson and nine other members, and one such member to be designated as Vice-Chairperson. Details of these responsibilities are given as under:

1. Lay down policies on disaster management;
2. Approve the National Plan;
3. Approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan;
4. Lay down guidelines to be followed by the State Authorities in drawing up the State Plan
5. Lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects;
6. Coordinate the enforcement and implementation of the policy and plan for disaster management;
7. Recommend provision of funds for the purpose of mitigation;
8. Provide such support to other countries affected by major disasters as may be determined by the Central Government;
9. Take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary;
10. Lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

National Executive Committee (NEC)

National Executive Committee is constituted under Section 8 of DM Act, 2005 to assist the National Authority in the performance of its functions.



State level Institutions

State Disaster Management Authority (SDMA) The DM Act, 2005 provides for constitution of SDMAs and DDMAs in all the states and UTs.

District level Institutions

District Disaster Management Authority (DDMA)

Section 25 of the DM Act provides for constitution of DDMA for every district of a state. The District Magistrate / District Collector/ Deputy Commissioner heads the Authority as Chairperson besides an elected representative of the local authority as Co-Chairperson except in the tribal areas where the Chief Executive Member of the District Council of Autonomous District is designated as Co-Chairperson. Further in district, where Zila Parishad exist, its Chairperson shall be the Co-Chairperson of DDMA.

The District Authority is responsible for planning, coordination and implementation of disaster management and to take such measures for disaster management as provided in the guidelines. The District Authority also has the power to examine the construction in any area in the district to enforce the safety standards and to arrange for relief measures and respond to the disaster at the district level.

International Frameworks

The Hyogo Framework for Action 2005-2015

The Hyogo Framework for Action (HFA): Building the Resilience of Nations and Communities to Disasters has been the first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses. It was developed and agreed on with the many partners needed to reduce disaster risk – governments, international agencies, disaster experts and many others- bringing them into a common system of coordination. The HFA guidelines five priorities for action and offers guiding principles and practical means for achieving disaster resilience. Its goal was to substantially reduce disaster losses by 2015 by building the resilience of nations and communities to disasters. This means reducing loss of lives and social, economic and environmental assets when hazards strike.[2]

In January 2005, 168 Governments adopted a 10-year plan to make the world safer from natural hazards at the World Conference on Disaster Reduction, held in Kobe, Hyogo, Japan. The Hyogo Framework is a global blueprint for disaster risk reduction efforts during the next decade. Its goal is to substantially reduce disaster losses by 2015 - in lives, and in the social, economic, and environmental assets of communities and countries. The Framework offers guiding principles, priorities for action, and practical means for achieving disaster resilience for vulnerable communities.

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

Sendai Framework for Disaster Risk Reduction

The Sendai Framework is a 15-year, voluntary, non-binding agreement which recognizes that the Government has the primary role to reduce disaster risk, but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders. It aims for the following outcome:

The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters. It is the outcome of stakeholder consultations initiated in March 2012 and inter-governmental negotiations held from July 2014 to March 2015, which were supported by the UNISDR upon the request of the UN General Assembly.

The Four Priorities for Action Plans

Priority 1. Understanding disaster risk

Disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be used for risk assessment, prevention, mitigation, preparedness and response.

Priority 2. Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is very important for prevention, mitigation, preparedness, response, recovery, and rehabilitation. It fosters collaboration and partnership.

Priority 3. Investing in disaster risk reduction for resilience

Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment.

Priority 4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

The growth of disaster risk means there is a need to strengthen disaster preparedness for response, take action in anticipation of events, and ensure capacities are in place for effective response and recovery at all levels. The recovery, rehabilitation and reconstruction phase are a critical opportunity to build back better, including through integrating disaster risk reduction into development measures.

Chapter 2
Disaster Management Cycle

Important terms

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.

Emergency

It 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.

Disaster management

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

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. Hazards may be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity or magnitude, frequency and probability.

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, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.[4]

Approach

A holistic and integrated approach will be evolved towards disaster management with emphasis on building strategic partnerships at various levels. The themes underpinning the disaster management policy are:

(1) Community based DM, including last mile integration of the policy, plans and execution.
(2) Capacity development in all spheres.
(3) Consolidation of past initiatives and best practices.
(4) Cooperation with agencies at national and international levels.
(5) Multi-sectoral synergy.[5]

Goals of Disaster Management:

(1) Reduce, or avoid, losses from hazards;
(2) Assure prompt assistance to victims;
(3) Achieve rapid and effective recovery.

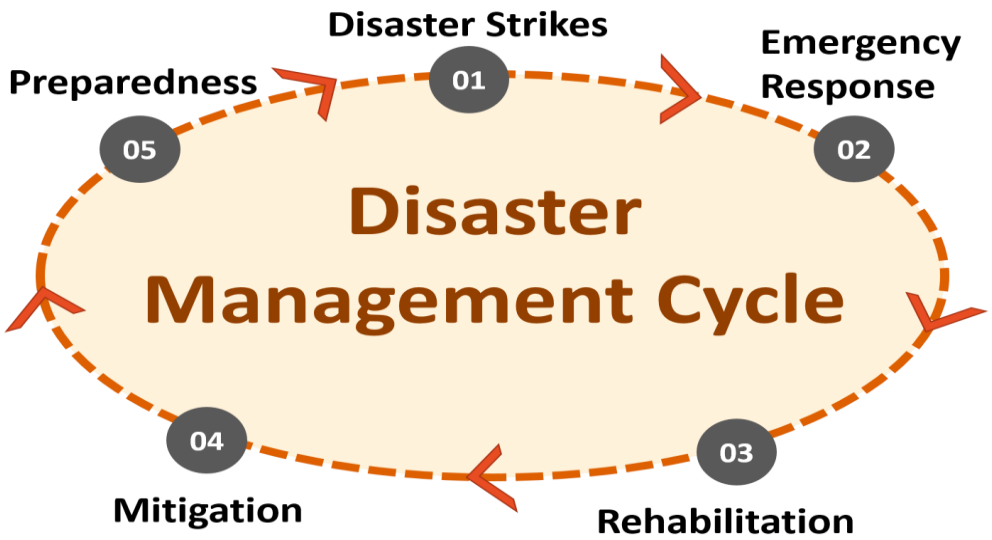
Source: http://www.gdrc.org/uem/disasters/1-dm_cycle.html

Phases of Disaster Management cycle

Since World War II emergency management has focused primarily on preparedness. Often this involved preparing for enemy attack. Community preparedness for all disasters requires identifying resources and expertise in advance and planning how these can be used in a disaster. However, preparedness is only one phase of emergency management.6

The Disaster management cycle illustrates the ongoing process by which governments, businesses, and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster, and take steps to recover after a disaster has occurred.

Current thinking defines five phases of disaster management cycle:



Disaster Management Cycle	
Disaster Strikes A sudden calamitous event bringing great damage, loss, or destruction	In November 1977, the South Indian state of Andhra Pradesh was hit by a devastating cyclone with a wind speed of over 200 kmph. The accompanying storm surge wiped out over 90 villages lying along the coastal belt. It left behind over 10,000 dead, many more injured and total economic loss of 378 crore rupees. Andhra Pradesh, situated on the east coast of India has a 1,030 km coastline, which is highly vulnerable to cyclones. Situated along the coastline are more than 2,500 villages with a population in excess of 6 million.
Emergency Response Actions taken to save lives and prevent further property damage in an emergency.	Immediately after the cyclone, as an immediate response, the government and NGOs extended relief to the affected people. This included search & rescue, water, medicines, food and temporary shelter in relief camps and tents
Rehabilitation Actions taken to return to a normal or an even safer situation following an emergency.	Soon after the initial relief phase, rehabilitation initiatives were taken up by Government and NGOs. Roads, permanent houses, and water, power and communication networks were restored. This also included economic rehabilitation through livelihood support. The union government provided 3.11 crore rupees to small and marginal farmers and workers for their recovery. Over 1.1 crore rupees were sanctioned for irrigation, municipal development and Panchayat Raj.
Mitigation Activities that prevent an emergency, reduce the chance of an emergency happening, or reduce the damaging effects of unavoidable emergencies.	If effective prevention and preparedness measures are implemented, disasters can be avoided by limiting the adverse impact of inevitable natural phenomenon. The development phase that followed the rehabilitation incorporated measures to reduce the impact of future cyclones. Villagers were relocated to safer lands; plantation was promoted, and cyclone resistant construction technologies were practised.
Preparedness Plans or preparations made to save lives and to help response and rescue operations.	After the cyclone, more emphasis was given on community preparedness measures by the government and NGOs. Village Task Forces were formed and trained, and cyclone shelters constructed. By 1990, 740 cyclone shelters were built in strategic locations. An additional 1,100 relief camps had the capacity to accommodate 650,000 people on short notice.

Kerala State Profile

Kerala, the Gods own country, it is popularly known, is a land blessed with natural resources. It is home to 3.44% of India's population. Kerala ‘s rate of population growth is India's lowest, and Kerala's population as per Census 2001 was 318.41 lakh consisting of 154.69 lakh males and 163.72 lakh females. Kerala's human development indices— primary level education, health care and elimination of poverty—are among the best in India. Kerala has one of the highest literacy rates (97.0%) among Indian states and life expectancy (73 years) was among the highest in India.[7]

Kerala State is vulnerable to a multitude of disasters and is categorized as a multi-hazard prone state. The state experiences various kinds of disasters of recurrent nature which result in loss of life, livelihood and property (public and private), and disruption of economic activity, besides causing immense misery and hardship to the affected population. The state experiences heavy rainfall and flood during the southwest monsoon, with subsequent damage to life and property. Drought conditions have also become more frequent during the pre-monsoon period.

Coastal erosion along the coastal areas is very severe, necessitating frequent evacuation and rehabilitation of the coastal people. Incidences of biological disasters such as epidemics, pest attack are also on the rise. Landslide or landslip is another hazard of the hilly regions of the state. The tsunami that struck Kerala Coast in 2004 has added a new dimension to the disaster scenario of the state.

The State is also vulnerable to cyclone and experiences high winds due to the westward movement of cyclonic storms. Kerala falls under earthquake Zone III makes the state vulnerable to earthquakes of magnitude of 6.5 or more. Possibilities of chemical and industrial disasters and disasters like dam burst also cannot be ruled out. The threat of Global Warming and its resultant climatic variations such as inter seasonal variations in rainfall, environmental issues and rise in sea level increase the vulnerability of the state.[8]

Need for Disaster Management Policy

While disasters cannot be completely avoided, the vulnerability to various hazards can be sustainably and substantially reduced by planned prevention, mitigation and preparedness measures. With this in view, the Kerala State Disaster Management Authority has formulated the 'Kerala State Disaster Management Policy'. The Disaster Management Policy calls for mechanism for coherence and alignment with existing policies of the government and future legislations.

Climate change and Disaster Risk Reduction

Climate change and climate-sensitive disasters, such as those resulting from hydrological, meteorological, biological and climatological hazards have significant and increasing impacts on human health. Climate change and climate-sensitive disasters impact health through common direct and indirect pathways potentially resulting in increased risk of death, disease and injury[9]

The recent disasters demonstrated the link between environment and disaster risk. While the floods cannot be exclusively attributed to climate change impact, climate change predictions do indeed forecast increases in rainfall intensity in Kerala in the years to come. Furthermore, coastal cities in Kerala are prone to waterlogging and flooding due to increased water inflow as well as sea level rise. The agriculture and related activities in Kuttanad, which is a below sea level area, are expected to be severely affected by climate change. So, regardless of whether the present event is linked to climate change, the floods of 2018 and the tropical cyclone Okhi before that serve as warnings about the extreme events which Kerala may

expect more frequently in a world with changing climate. Therefore, assessment of vulnerabilities and actions in climate change adaptation and mitigation should be integral to the 'New Kerala' being envisaged in the post-disaster setting.[10]

Action that addresses the interlinked challenges of disaster risk, sustainable development and climate change is a core priority given that 90% of recorded major disasters caused by natural hazards from 1995 to 2015 were linked to climate and weather including floods, storms, heatwaves and droughts. The five countries hit by the highest number of disasters were the United States (472), China (441), India (288), Philippines (274), and Indonesia, (163).

UNISDR (United Nations International Strategy for Disaster Reduction) is focused on the following:

(1) Achieving stronger recognition of disaster risk reduction and climate change adaptation as essential elements of climate risk management and sustainable development.
(2) Developing specific policies at the international level on the linkages between reducing disaster risk and responding to climate change
(3) Guiding national and regional action to integrate policies and practices and strengthening capacities to support the integration of disaster reduction and climate change by all actors.
(4) Enhance knowledge and understanding of comprehensive risk management approaches.[11]

Chapter 3
Hazards, Vulnerability Analysis of Kerala

Kerala State profile

Feature	Description
Area	38,863 km^2
Location	Graticule 8°18'N & 12°48'N and 74°52'E & 77°22'E
Rivers	44
Forest	11,266 km^2
Coastline	590 km
Population	3,33,87,677 (Census, 2011)
Male Population	1,60,21,290
Female Population	1,73,66,387
Population density	860 people/km^2
Population growth rate	4.9%
Districts	14
Taluks	75
Corporations	6
Municipalities	87
Villages	1664* (including group villages)
Lok Sabha Constituencies	20
Rajya Sabha Constituencies	9
Assembly Constituencies	140
Climate	Humid equatorial tropic climate; the dominant climatic phenomena being the monsoons called the South-West (June to September) and the North-East (October to December) monsoons, the former is more significant than the latter with an annual rainfall of 3104 mm mainly contributed by the South West Monsoon

Kerala is geographically bordered on the west by the Arabian Sea and the east by the Western Ghats. In its north is Karnataka State and to the east is Tamil Nadu State.

Kerala is multi-hazard prone. HDI (Human Development Index) being a composite index of consumption rate (proxy to purchasing power), education and health, is an indicator of the socio-economic vulnerability of the population. The higher the HDI, the higher is the coping capacity, but greater is the cumulative loss potential and thus a higher degree of risk.

Thus, Kerala has a higher degree of disaster risks as compared to the rest of the country. The Kerala State Disaster Management Plan (KSDMP) is an ever evolving document formulated under the Disaster Management Act, 2005 (DM Act, 2005) which establishes a multi stakeholder framework for the partnership of governmental entities, non-government agencies, private sector enterprises and individuals for Disaster Risk Reduction in the State.

Policy

In accordance with Section 18 (2) (a), the Kerala State Disaster Management Authority (KSDMA) has prepared the Kerala State Disaster Management Policy. The policy shall be revisited once in 10 years.

The KSDMP should deal with:

1. The vulnerability of different parts of the State to different forms of disasters
2. The measures to be adopted for prevention and mitigation of disasters
3. The way the mitigation measures shall be integrated with the development plans and projects
4. The capacity-building and preparedness measures to be taken

VULNERABILITY OF KERALA

What is HVRA (Hazard, vulnerability and risk assessment)

1. Combined process of quantifying the spatio-temporal return probabilities of various hazards
2. The expected degree of damage that a given element or set of elements-at-risk is exposed to
3. The expected monetary losses when a given area is exposed to hazards within a given period.

A disaster is when the threat of a hazard becomes reality and impacts a vulnerable society.

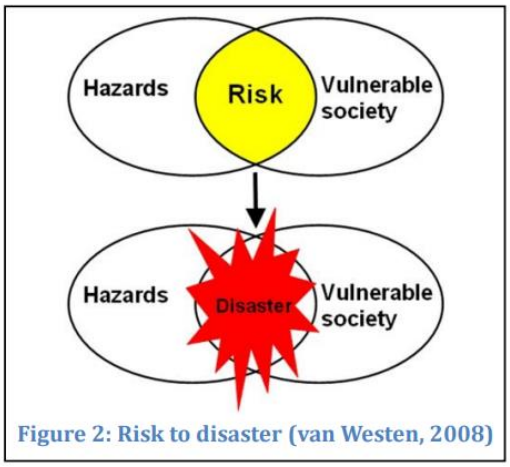


Figure 2: Risk to disaster (van Westen, 2008)

In the context of HVRA, the terms hazard, vulnerability and risk have specific definitions.

Hazard (H) is the probability of occurrence of a potentially damaging phenomenon within a specified period, within a given area. (for example, how to calculate the return probability of epidemics, road accidents, lightning strikes etc.)

Vulnerability (V) the degree of loss to a given element or set of elements-at-risk resulting from the occurrence of a natural phenomenon of a given magnitude. Usually expressed on a scale from 0 (no damage) to 1 (total damage).

Risk (R) the actual exposure of something of human value to a hazard, often expressed in monetary value/time. (For example, an ancestral temple, a tomb, a pregnant woman, etc.)

The universally accepted method for conducting HVRA follows the guiding formula:

R = H * V * Amount

where, Amount is the monetary-value of the element(s)-at-risk

Objective of HRVA

The primary objective of undertaking a HVRA is

1. To anticipate the potential hazards and possible mitigation measures to help save lives
2. Protect property, assets, reduce damage and facilitate a speedy recovery.

The HVRA helps the policy makers, administrators and the community to make risk-based choices to address vulnerabilities, mitigate hazards, and prepare for response to and recovery from hazard events. Further, in areas identified as potential hazard hotspots through HVRA, early warning systems that incorporate instrumented monitoring devices, high-end numerical predictive models and communication devices may be developed and deployed such that sufficient time may be made available to authorities for evacuation and implementing contingency measures in the eve of an impending disaster.

The World Bank has identified five key insights in the process of risk management which includes:

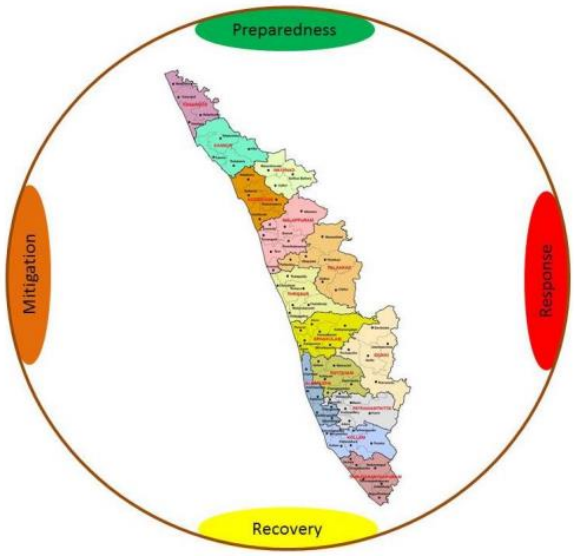
1. Taking on risks is necessary to pursue opportunities for development. The risk of inaction may well be the worst option of all
2. To confront risk successfully, it is essential to shift from unplanned and ad-hoc responses when crises occur to proactive, systematic, and integrated risk management
3. Identifying risks is not enough: the trade-offs and obstacles to risk management must also be identified, prioritized and addressed through private and public action
4. For risks beyond the means of individuals to handle alone, risk management requires shared action and responsibility at different levels of society, from the household to the international community
5. Governments have a critical role in managing systemic risks, providing an enabling environment for shared action and responsibility, and channelling direct support to vulnerable people

Thus, it is reiterated that HVRA alone will not ensure a safe society, but it is the first step towards ensuring a disaster sensitive development plan which can ensure coordinated public and private action for disaster risk reduction.

Hazard profile of Kerala

Kerala state is frequently ravaged by the disastrous consequences of numerous hazards and hence it is a multi-hazard prone State. Natural hazards are part of the natural evolutionary system of the earth which turned into 'hazards' when the human system started interacting with it. The human system itself was subjected to significant transformations over its history. These transformations and their links to the natural system have served as templates of the dynamics of naturally triggered hazards and therefore, of disasters.

Parallel to this societal transformation, the population pressure along the coastline forced the then marginalized sections of the community to migrate from the coastal belt to the relatively inhospitable terrain of the Western Ghats (George and Chattopadhyay, 2001). A study conducted on migration suggested that in the past 80 years the coastal plains recorded a population growth of 306%, whereas the highlands, foothills and uplands together experienced a growth of 1342%.



Kerala is prone to high incidence of lightning, especially during the months of April, May, October and November. Apart from floods the mountain regions of the state experience several landslides during the monsoon season. It is known that a total of 65 fatal landslides occurred between 1961 and 2009 causing the death of 257 individuals (Kuriakose, 2010). Between 1871 and 2000, the state experienced 12 moderate drought years. The 570 km long coastline of Kerala is prone to erosion, monsoon storm surges and sea level rise. Land subsidence due to tunnel erosion or soil piping, which is a slow hazard, is recently noticed to be affecting the hilly areas in the state.

KSDMP identifies thirty nine (39) phenomena with potential to cause disasters requiring L2 attention that the state is susceptible to and they are grouped under two categories based on the major triggering factors, they being Naturally Triggered Hazards (Natural Hazards) and Anthropogenically Triggered Hazards (Anthropogenic Hazards). Not all these hazards turn into disasters that are 'beyond the coping capacity of the community of the affected area'.[12]

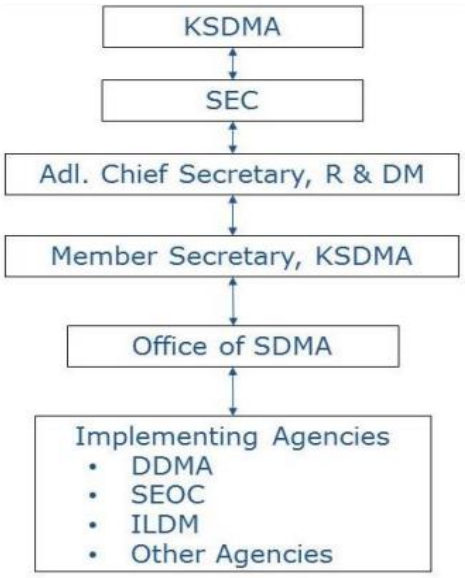
Role definition aligned with Kerala SDMP 2016

The Kerala State Disaster management Plan (SDMP) 2016 recommends that the State Government shall ensure that there is a professionally trained virtual cadre of officers in all the departments of the State for disaster management. The virtual cadre will principally be 15 selected individuals (one each in each district and one in the State level) with at least 20 years more of service left.

The members of this virtual cadre shall be the departmental nodal officers for disaster management who shall be as individuals responsible for supporting the district and state disaster management authorities in disaster management. The KSDMA will ensure that these individuals are adequately trained in matters related to disaster management. These officers shall be trained in rapid damage assessment and certification in the respective sector. The disaster-specific nodal departments through this virtual cadre will ensure liaison and coordination with KSDMA and DDMAs in the smooth implementation of the departmental disaster management plan and with SEOC and DEOCs for ensuring coordinated response to events.

Role definition aligned with NDMP 2016 and SFDRR

The role of virtual cadre officials are determined through SDMP keeping in mind the Sendai Framework (2015-2030), the Disaster Management Act 2005, the National Disaster Management Policy, 2009, the Kerala State Disaster Management Rules, 2007 and the Kerala State Disaster Management Policy, 2010 and the National Disaster Management Plan, 2016. The National Disaster Management Plan 2016 lays down an excellent planning framework for India by aligning with the Sendai Framework for Disaster Risk Reduction 2015-2030, to which India is a signatory.



The NDMP incorporates substantively the approach enunciated in the Sendai Framework and will help the country to meet the goals set in the framework.

By 2030, the Sendai Framework aims to achieve substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries. The NDMP has been aligned broadly with the goals and priorities set out in the Sendai Framework for DRR. The framework states that to realize this outcome, it is necessary to prevent new and reduce existing disaster risk through the implementation of integrated and inclusive measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for

response and recovery, and thus strengthen resilience. These measures must cover various sectors such as:

The plan includes measures that will be implemented over the short, medium, and long-term over the time horizon of the Sendai Framework ending in 2030.

Department - wise Disaster management planning

Animal Husbandry

Brief Profile of the Department

Around 8.8 million households in Kerala are involved in animal husbandry and nearly 94% of the livestock population is concentrated in rural areas. In the subsector of animal husbandry and dairy development, Alappuzha, Kottayam, Pathanamthitta, Ernakulam, and Thrissur districts suffered the most in the 2018 floods. The share of livestock in Kerala's GSVA is 3.84%.

Role of Department as given in SDMP

Role of Department as given in SDMP

Ensure	Ensure rate contracts for fodder, feed, water and medicines prior to monsoon season and disease prone seasons
Ensure	Ensure proper administration of deworming and vaccinations for cattle, sheep and goats, pigs and other relevant measures for disease management in cattle camps
Identify	Identify sources for emergency procurement of fodder, feed, water and medicines prior to monsoon season and disease prone seasons
Identify and map	Identify and map safe locations for cattle and poultry camps in flood prone areas
Identify and map	Identify and map locations for burial of carcases
Map	Map animal and avian disease prone areas

Preparation of Departmental Disaster Management Plans

Introduction

The departmental disaster management plan should be comprehensive and spell out the roles of the departments that are responsible to manage the disasters related to them in each phase of the disaster (during normal times, pre-disaster, during and post-disaster phase).

Pre-disaster Phase: Pre-disaster prevention and mitigation activities should be carried out with the normal staff while post-disaster rescue, relief and recovery will need outside resources. Normally in disaster management plans pre-disaster activities are ignored or given less importance. A brief outline of the activities to be undertaken are provided without clearly providing for funds or spelling out the responsibilities. The mitigation plan should consist of the objectives and goals and the necessary strategy to be adopted along with a realistic time frame. The sub-activities and the agencies responsible should also be mentioned in the plan. The plan should also identify the necessary policy and legal framework, which provides the agency the mandate to carry out such activities. If they need a new policy or a legal framework it should also be identified and the time frame with in which such a framework will be provided should also be worked out and mentioned in the plan. It is administrative orders wherever required should be issued.

The most important aspect of the mitigation plan should be provision of funds for the activity and how it will be provided. Disaster mitigation plan cannot be a stand-alone activity. The plan should also mention how mitigation will be integrated with the normal working of the ministry and the special programs or projects undertaken will be integrated with the normal activity of the ministry and made sustainable.

The plan should also provide for a monitoring mechanism and monitoring indicators. The plan should also have a provision for evaluation and mid-term correction.

Preparedness and post-disaster response: The second part of the plan should focus on the preparedness and emergency response. Preparedness is simply keeping the manpower and equipment required for response in a state of readiness. This manpower and equipment resource base should contain what is readily available with government and what should be requested from outside.

As part of the preparedness measure the existing resources should be identified and augmentation of the same if required should also be worked out. Training, capacity building and maintenance and responsible agencies should also be mentioned. The budget for the same should also be provided in the plan.

The sources outside the government will include non-governmental agencies, private industrial houses, neighbouring states, volunteers and international community. The database of what is available in private with in the country; the list of NGOs with their expertise and details about mobilization of volunteers should also be part of the plan.

Disasters are of two types, those that have a warning such as floods, cyclones etc., and those, which strike without warning such as earthquakes and flash floods etc. Many disasters are of seasonal nature such as floods, cyclone etc. Depending on whether a disaster is seasonal or not, the role and duties of the department should be worked out for pre-disaster stage. If the disaster has a prior – warning stage the various activities to be undertaken should be mentioned. For example, cleaning of drains or water channels before the rainy season or vaccination or immunization before rainy or flood season etc.

If the disaster has a warning stage then the method of altering the administrative machinery, volunteers and the communities should be mentioned in the plan along with a evacuation plan if necessary. The method of moving or shifting the response teams etc near to the area where rescue is need should be pre identified.

The main thrust area of the response portion of the plan is post-disaster search, rescue and relief. What should be done, who will do it, when and how it will be done should be clearly covered in the plan. (If necessary one can use a matrix). Though this portion varies from ministry to ministry there are certain general details, which should be covered in every plan such as mobilization of resources, co-ordination with the EOC, reporting system etc. for the purposes of emergency response a SOP should be evolved which should become part of the plan. A matrix which spells out what should be done up to 72 hours starting from zero hour (the time of receipt of information about the disaster) with increasing time intervals starting from 15 mins will be of help.

Some of the annexure required are

- The hazard, vulnerability and risk map
- Contact numbers
- Details of outside resources

Mock-drills and testing and revision and updating the plan:

Periodic mock drills should be conducted, and the plan should be tested. The plan should be revised after each mock drill taking in to account the lessons learnt from the drill. Apart from the revision done the plan should also be updated on a periodic basis. An ideal plan should also contain details about when and how this plan will be tested and updated.

Contents required in Departmental Disaster Management Plans as per National Guidelines.

Chapter 1: Prevention, Mitigation and Preparedness Plan

1. Brief profile of the department
2. Measures necessary for prevention of disasters, mitigation, preparedness and capacity-building in accordance with the guidelines laid down by the National Authority and the State Authority.
3. Integration into its development plans and projects, the measures for prevention of disaster and mitigation in the departmental annual plan.
4. Provision of funds for prevention of disaster, mitigation, capacity- building and preparedness from the respective departmental budget head
5. Drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personal in relation to disaster management
6. Review the enactments administered by it, its policies, rules and regulations with a view to incorporate therein the provisions necessary for prevention of disasters, mitigation or preparedness
7. Provision of emergency communication in the affected areas for the department
8. Such other actions as may be necessary for disaster management

Chapter 2: Response plan

1. Mechanism for early warning and dissemination thereof based on warnings issued by IMD, State Emergency Operations Centre or the District Control Rooms
2. Trigger Mechanism for response – who in the department will alert the concerned officers in the department and if alerted what triggers are to be initiated by the concerned officer
3. Response plan for responding effectively and promptly to any threatening disaster situation or disaster in accordance with the State plan, and in accordance with the guidelines or directions of the National Executive Committee and the State Executive Committee and the State Government and the SDMA
4. Appointment of Nodal Officers to perform Emergency Support Functions (ESFs)/roles in emergency in the format already circulated by the State Government V. Constitution of the incident Response Teams (IRTs) at all levels with provision of delegation of authority
5. Reporting procedures and formats
6. Role of NGOs and Voluntary Sector and coordination thereof
7. System of assessing the damage from any disaster
8. Roles and responsibilities and coordination mechanism for the department

9. Disaster Specific response Plan – Response plan for major disasters such as earthquake, flash flood/cloud burst, snow avalanche, landslide etc in which State level response would be needed
10. Identification of suppliers for departmental supplies and pre-contracting for supplies in case of emergencies

Chapter 3: Relief, Rehabilitation and Reconstruction

1. Norms of relief if applicable
2. Minimum Standards of relief
3. Rehabilitation Plan
4. Financial mechanism
5. Action plan for reconstruction – 'Building back better'
6. Please mention schemes of insurance and relief packages available in the department. Norms of the National /State Disaster Response Fund may be mentioned separately

Chapter 4: Knowledge Management

1. Documentation of losses in the animal husbandry & dairy sector for every department
2. Documentation of lessons learnt
3. Documentation of best practices and uploading of the same in the departmental websites

Chapter 5: Review, updating and Dissemination of Plan

1. DM Plan is a "living document" – would require regular improvement and updating – at least once a year
2. System of updating – who, when and how?
3. Dissemination of Plan to stakeholders – how? – Printing of document, uploading in departmental website, meetings, seminars etc

Annexures

1. Important contact details – National, State, local level of the department etc
2. Resource list (available with Department) with contact persons details (kindly follow IDRN Format) www.idrn.gov.in
3. Resources available with National Govt. level
4. Detailed Standard Operating Procedures (SOPs) for all phases of disasters – before, during and after
5. List of NGOs/INGOs/CBOs working in the field of the department
6. List of suppliers relevant for the department
7. Damage Assessment Formats
8. Reporting formats

Emergency Operation Centre

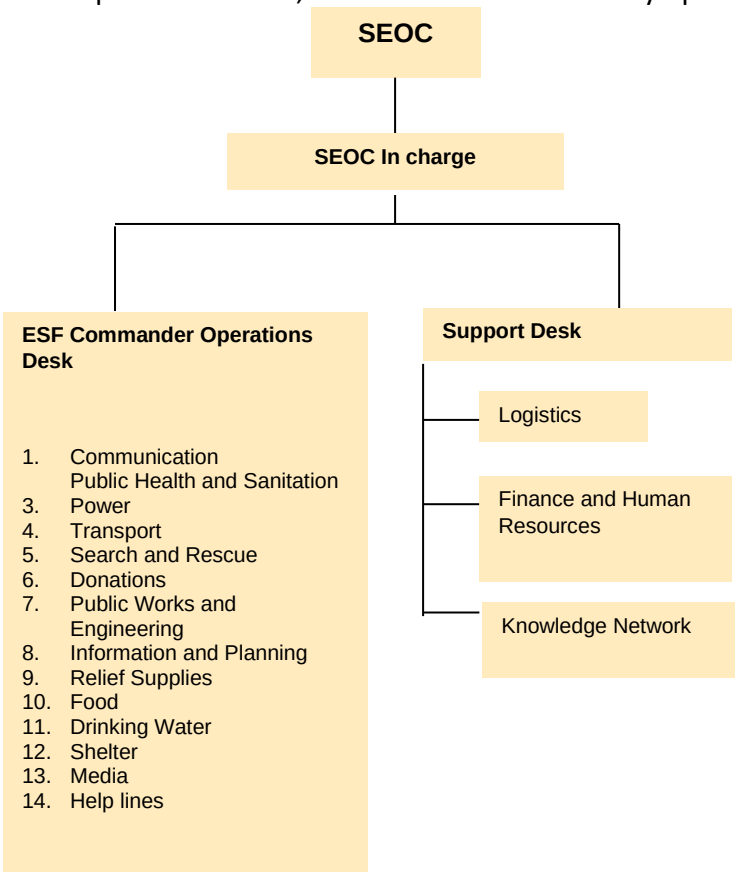
The State Emergency operation Centre (SEOC) will be hub of all the activities related with disaster response in the state. The primary function of the SEOC is to implement the State

Disaster Management Plan, which includes coordination, data collection, operation management, record keeping, public information, and resource management.

For the effective management of resources, disaster supplies and other response activities, focal points or centres will have to be established. These points will have to be well networked starting from the State to the District and finally leading to the disaster site.

Emergency Operations Centres at the State (SEOC) and the District (DEOC) and Incident Command Post (ICP) at the disaster site are the designated focal points that will coordinate overall activities and the flow of relief supplies from the State.

The State Emergency Operations Centre (SEOC) will be maintained and run round the clock which will expand to undertake and coordinate activities during a disaster. Once a warning or a First Information Report is received, the SEOC will become fully operational.



During a disaster situation, the SEOC will be under direct command of the Chief Secretary or the designated person by him as the Chief of Operations.

During non-disaster times, the State Emergency Operations Centre stays operational throughout the year in preparedness mode, working during day time in order to take care of the extended preparedness activities of data management, staff awareness and training, which is essential for the smooth functioning of the SEOC during crisis situations and handling of emergency Toll Free Contact Lines. During an emergency, the SEOC will get upgraded and will have all emergency stakeholders manning it round the clock.

The aim of the EOC will be to provide centralized direction and control of all the following functions:

- Emergency operations
- Communications and warning, which includes handling of 24 hrs emergency toll free numbers.
- Centralised state level disaster resource database
- Requesting additional resources during the disaster phase from neighbouring districts of the affected area
- Coordinating overseas support and aid.
- Issuing emergency information and instructions specific to departments, consolidation, analysis, and dissemination of Damage Assessment data and preparation of consolidated reports.

Organizational Setup of SEOC

The EOC will comprise the following:

SEOC In-charge

- During non-disaster times, the SEOC will work under the supervision of the relief commissioner.
- In a disaster situation, the SEOC will come under direct control of the Chief Secretary or the person designated by him as the Chief of Operations. He is the primary role player in the EOC and is responsible for the overall coordination and decision-making. He will also report the status of the SEOC operations and the disaster situation to the Chief Secretary.

Operations Section

The Operations Section will ensure smooth and planned functioning of the SEOC. It will fulfil the following functions:

- Handle requests for emergency personnel, equipment and other resources
- Designate responsibilities and duties for management of the SEOC
- Manage storage, handling and set-up of incoming equipment and personnel
- Ensure medical care, feeding and housing for SEOC personnel
- Maintain documentation of resource inventories, allocation and availability.
- Manage finances for SEOC operations

Representatives in SEOC

Representatives of State Departments of the following departments will be present at the SEOC to take part in the operations and facilitate quick coordination between the SEOC command and their parent departments towards ensuring quick information availability and decision-making:

- Department of Public Works
- Department of Irrigation
- Department of Energy
- Department of Home
- Department of Revenue
- Department of Health
- Department of Agriculture
- Department of Industries

Emergency Support Functions (ESF) have been established, to support the SEOC functions. Each ESF is headed by a lead department for coordinating the delivery of goods and services to the disaster area, and it's supported by various departments and agencies.

During a disaster, the ESFs will be an integral part to carry out response activities.

After a major disaster or emergency requiring State response, primary agencies, when directed by the EOC will take actions to identify requirements and mobilize and deploy resources to the affected are and assist the State in its response actions under fourteen ESFs

Location of SEOC

The SEOC is established in the Department of Revenue. The layout of the SEOC is given below.

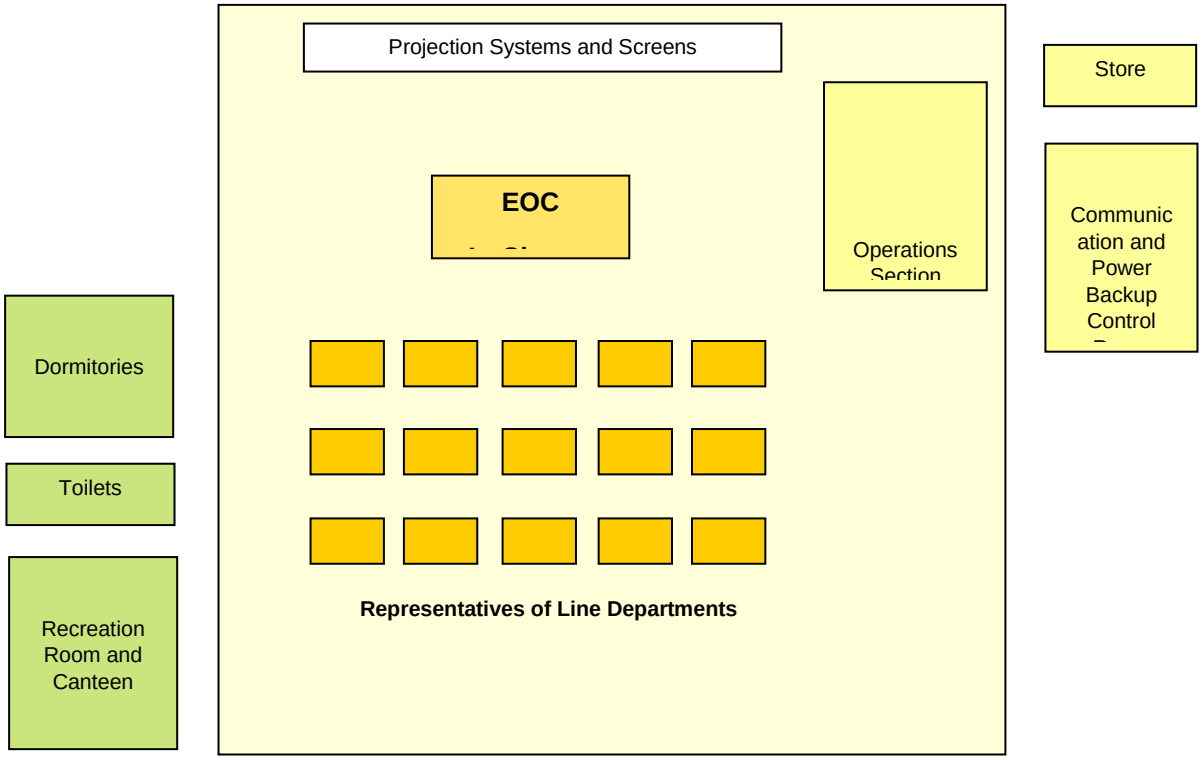
- The Chief of Operations will initiate the activation of emergency services of the SEOC.
- Activation of the SEOC should immediately follow the declaration of a State Level Emergency.
- The Individuals staffing the SEOC are responsible for establishing communications with their respective departments through radio and telephone etc.
- The SEOC Chief or designee will determine what staff he/she deems necessary to effectively operate the SEOC apart from the prescribed staff.
- The designated officers of the Police will provide security at the SEOC.

Back-up SEOC

It is recommended that an alternate SEOC must also be established. It is suggested to setup the backup SEOC within the secretariat building, as most of the departmental heads sits there.

SEOC Layout

A conceptual layout of SEOC is given below.



Equipment Requirements

The SEOC will need to operate round the clock and may itself be subjected to adverse conditions due to the impact of disaster. It needs to be equipped with the following hardware and software for its efficient functioning:

- Resource Inventories and databank of maps and plans at block, district and state level on a GIS platform for quick retrieval and analysis.
- State-of-art communication equipment for staying linked with the Chief Secretary's office, headquarters of line departments, district collectors, field teams, media, and national and international support agencies.
- A mobile command vehicle with communication equipment.
- Workstations and communication lines for all representatives of the line ministries.
- Radios and television sets tuned to different news channels and coverage.
- Video conferencing facility.
- Projection equipment and screens.
- Emergency power backup.
- Stock of drinking water, food, medicines, bedding and essential items required for personnel manning the SEOC for long time durations.

Resource Inventories

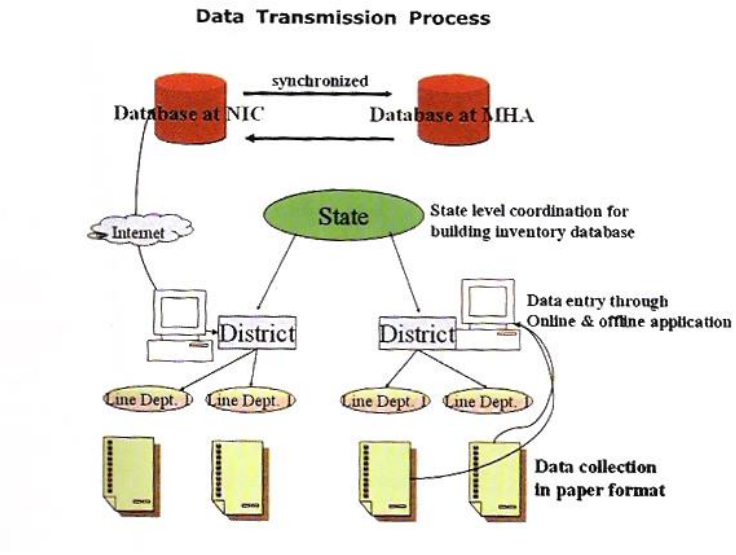
Resource inventories are useful in quick retrieval of vital information regarding availability and sources of rescue and relief material and personnel during times of emergency. Resource inventories are essential elements of EOC operations. Such inventories will be prepared and

maintained through regular updating at the State and District levels. Inventories will include the following basic elements, and other locally relevant information:

- Contact details of all personnel and organisations concerned with emergency management
- List, with specifications and availability procedures, of all equipment that may be useful for responding to an emergency. This will include communication equipment, transport vehicles, earth moving equipment, cranes, and tools etc. that are available with agencies within the jurisdiction.
- List, with specifications and rate schedules, of relief material that can be sourced from local aid agencies and markets. This will include dry rations, tents and bedding, clothing, utensils, first-aid items and other basic necessity items

India Disaster Resource Network (IDRN)

When disasters strike, the disaster managers at the district/ State level respond with the resources at their command. The difficulty is that while the Disaster Manager (District Magistrate/ Collector) is generally aware of the resources at his command in the district, he is not aware of the resources available in the neighbouring districts within the State or in the neighbouring States. The disaster manager at the State level [the Relief Commissioner] does not have an inventory of resources available within the State. Therefore, all the resources available within the State are not brought to bear for saving lives, and when some specialist equipment is required, there is a lack of knowledge as to the whereabouts of the equipment either in the neighbouring district or in the neighbouring State. Lives can be lost because of such delays/ lack of required resources. The IDRN addresses this lacuna in our disaster management system.



India Disaster Resource Network (IDRN) is one of the initiatives under the GOI-UNDP Disaster Risk Management Programme for disaster reduction. It is a nation-wide electronic inventories of essential and specialist resources for disaster response both specialist equipment and specialist manpower resources. The IDRN lists out the equipment and the resources by type and by the functions it performs, and it gives the contact address and telephone numbers of the controlling officers in-charge of the said resources so that the equipment can be promptly mobilized. The IDRN is a live system providing for updating of inventory every year. Entries into the inventory are made at two levels – district and State level. The Objectives of IDRN are:

- To collect and collate information on resources available in the country for emergency response.

- To enhance the decision-making capabilities of Government functionaries in quick response to emergencies.

IDRN is accessible to the Emergency officers, District Collectors, Relief Commissioners and other disaster managers at various levels of Government.

Activities of SEOC

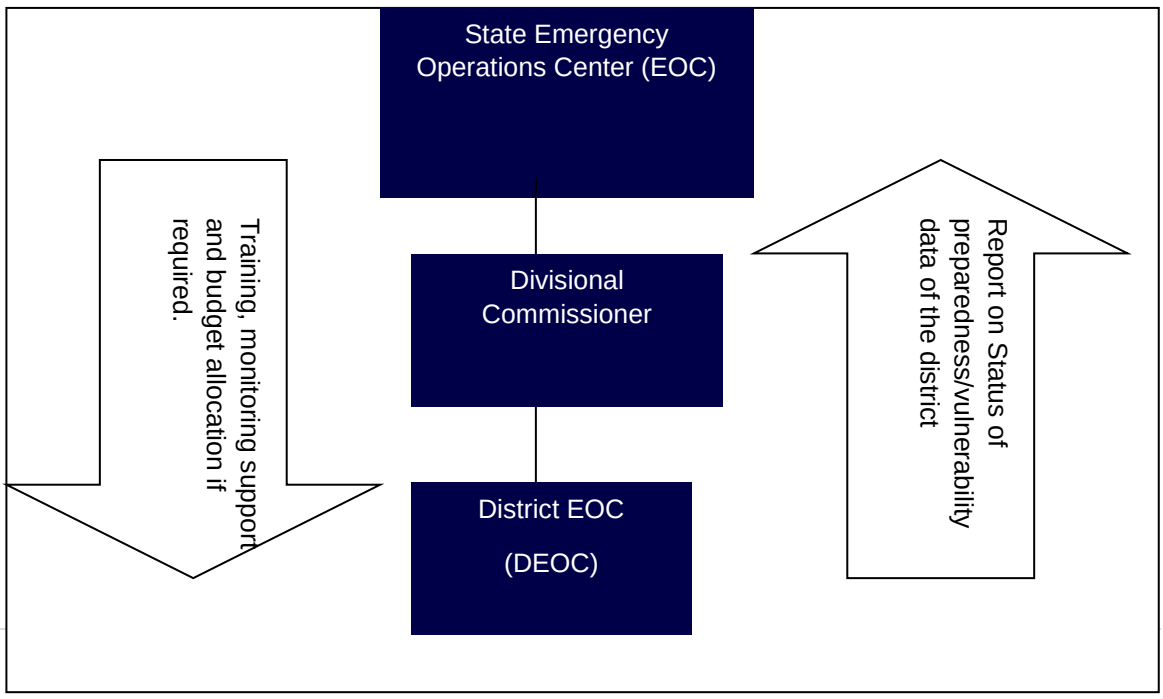
The responsibilities of SEOC at the state level shall be to provide centralized direction and control of the following activities:

Non-disaster time

During non-disaster times, the activities of the EOC will be under the supervision of the relief commissioner. Following are the activities during non-disaster times.

- Ensure that all districts prepare and regularly update the District Disaster Management Plans.
- Encourage districts to prepare area-specific plans for areas prone to specific disasters.
- Monitor training imparted to state level officials, private sector and NGOs in coordination with the HIDM.
- Keep record of the State and district disaster management plans.
- Disseminate information about the State DMP to other departments.
- Ensure that the warning and communication systems and instruments in the SEOC are in working conditions round the clock.
- Keep and update state level disaster resource inventory
- Establish functional facility of Toll free emergency numbers.

Flow of Information between SEOC and DEOC during normal conditions



Activation Procedure of the EOC

Once the Sub-Divisional officer/SDM deems a disaster to be beyond the management capacity of local authorities, the District Disaster Management Authority (DDMA) will declare it as a District Level Disaster and activate the DEOC. Once the DDMA deems a disaster magnitude to be beyond its management capability, it will forward the report to the SEOC for deliberation at the SDMA and subsequent appropriate State intervention. On verification of the magnitude of the disaster, and the scale of response required, the State Emergency Operations Centre will get activated and after declaring a State Disaster, will take control.

- **Step 1:** The State EOC is activated on orders from the SDMA. On receipt of a disaster warning or a FIR, the Chief Minister, after verification that the situation merits declaration of a State Disaster, will convene a meeting of the State Disaster Management Authority. Based on the ratification of the Authority, the Chief Minister, will declare a State Disaster.
- **Step 2:** SEOC is upgraded to emergency mode. The SEOC, till then operating in the preparedness mode, will be upgraded to the emergency mode. Concerned line departments will be informed to post their representatives at the SEOC on round the clock basis with immediate effect. SEOC will be activated and all community preparedness measures will be put into operation and the ESF to be on full alert and activate their SOPs. The activation of the SEOC should be followed when DDMA declares a major disaster.
- **Step 3:** Field Assessment Reports. The Chief Secretary/Relief Commissioner will assume the role of the Chief of Operations for Disaster Management. The Chief of Operations of the EOC will coordinate for setting up the ESFs and are asked to prepare and send the Field Assessment Report to the SEOC. The Chief of Operations of the SEOC will spell out the priorities coordinate services of the ESFs, including national and aid agencies.

Quick response teams of specialized personnel will have to be sent for effective management of disaster. Depending on the magnitude of the disaster, two different types of teams will be fielded by the SEOC: (i) Rapid Assessment Teams; (ii) Quick Response Teams

Rapid Assessment Teams

The Rapid Assessment Teams will be multi-disciplinary teams comprising four or five members. They will mainly comprise senior level specialized officers from the field of health, engineering, search and rescue, communication and one who have knowledge of disaster affected area, physical characteristic of the region, language etc. These officials should share a common interest and commitment. There should be a clear allocation of responsibilities among team members. To make a first / preliminary assessment of damage, the assessment report will contain the following basic elements or activities:

- Human and material damage
- Resource availability and local response capacity
- Options for relief assistance and recovery
- Needs for national / international assistance

Quick Response Teams / Rapid Response Teams

Deployment of search and rescue teams can help in reducing the numbers of deaths. A quick response to urgent needs must never be delayed because a comprehensive assessment has yet to be completed. The following teams must be sent to disaster site or disaster affected area as early as possible, even prior to First Information Report.

- First Aid Team
- Search and Rescue team
- Communication Teams
- Power Team
- Relief Teams
- Rehabilitation teams
- Transport Team

All other focal departments will keep ready their response teams, which may be deployed after receiving the first information report.

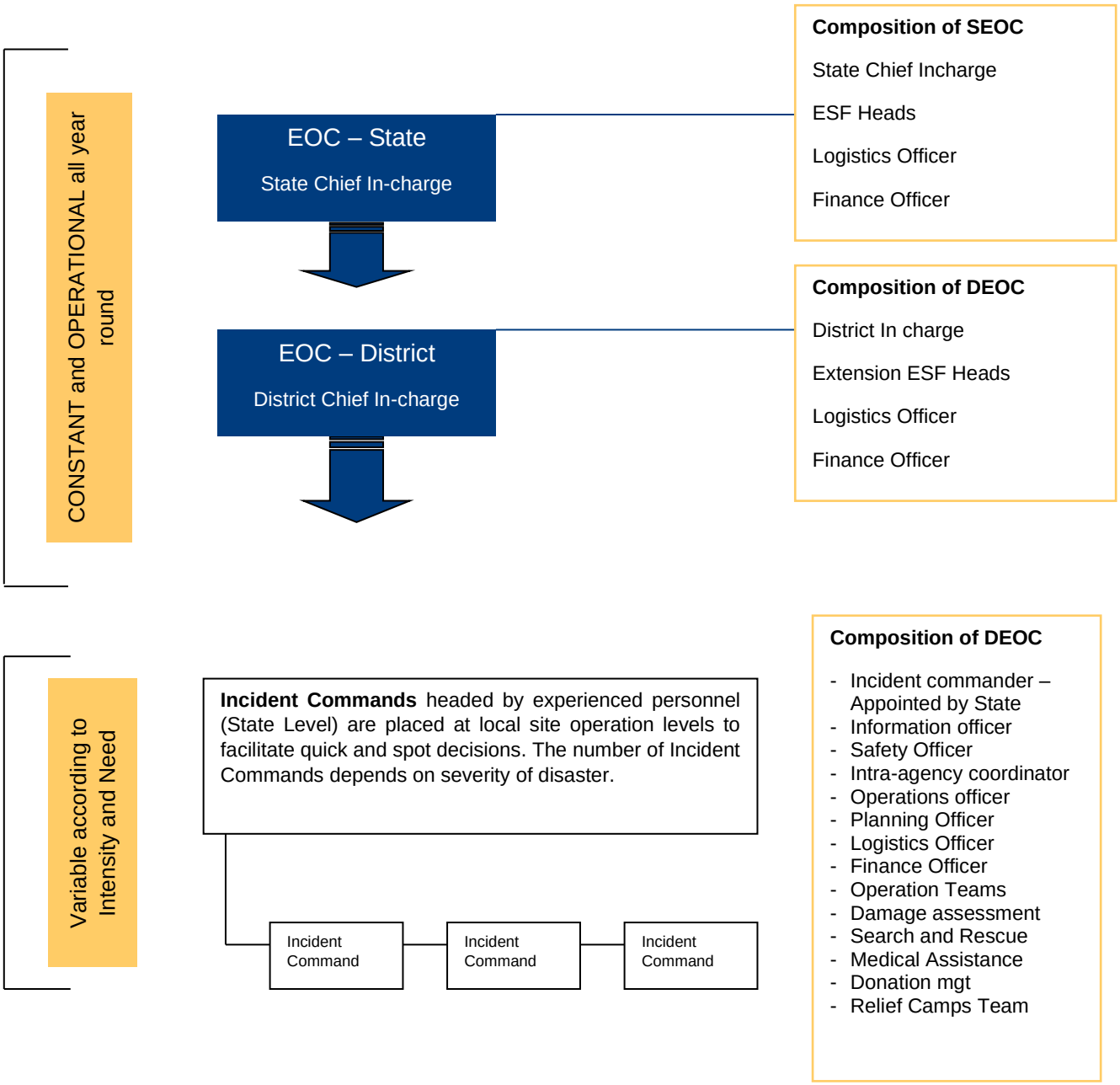
Incident Command System

The SEOC will need to field its own field teams and through them establish an Incident Command System. The system will comprise:

- Field command
- Field information collection
- Inter-agency coordination at field level
- Management of field operations, planning, logistics, finance and administration

Rapid Assessment Teams and Quick Response Teams described below will be fielded by the SEC through the SEOC as part of the Incident Command System.

OVERALL COMMAND FLOW CHART (EOC and ICS)



Institutional arrangement of SEOC

Chapter 4
Departmental Plan – Animal Husbandry

Animal Husbandry department – Brief Profile

Around 8.8 million households in Kerala are involved in animal husbandry and nearly 94% of the livestock population is concentrated in rural areas. In the subsector of animal husbandry and dairy development, Alappuzha, Kottayam, Pathanamthitta, Ernakulam, and Thrissur districts suffered the most in the 2018 floods. The share of livestock in Kerala's GSVA is 3.84%.

Role of Department as given in SDMP

♣ Map animal and avian disease prone areas

♣ Identify sources for emergency procurement of fodder, feed, water and medicines prior to monsoon season and disease prone seasons

♣ Ensure rate contracts for fodder, feed, water and medicines prior to monsoon season and disease prone seasons

♣ Identify and map safe locations for cattle and poultry camps in flood prone areas

♣ Ensure proper administration of deworming and vaccinations for cattle, sheep and goats, pigs and other relevant measures for disease management in cattle camps

♣ Identify and map locations for burial of carcases

Key Observations

- The Department is having a major role in pre disaster healthcare activities including vaccination.
- There is a dedicated State Animal Disease Emergency Control Room
- All the districts have emergency response centres under the animal husbandry department
- The departmental DM Plan has been formulated (as per the interview data shared by UNDP)
- At present, no specific policies related to DRR and DM

Standard Operating Procedures

Animal Husbandry Department

Actions During Normal Times (Mitigation)

– Develop Disaster Management Plan for the Department of Animal Husbandry at state level by consolidating the District Level Disaster Management Plans of the Department.

- Officials of the Department of Animal Husbandry should take part in the district level trainings on disaster management along with officials of other concerned departments. This would lead to better coordination between various departments.
- At least five officials from each district should be trained at state level as Master Trainers. Enough financial provision should be made for trainings.
- Organise disaster management trainings for hospital staff
- Carryout mock evacuation drills in hospitals periodically
- Ensure that all new health facility structures are designed and constructed disaster-safe
- Carryout safety audit of all health facilities in the State and identify weak structures
- Undertake structural retrofitting of weak structures
- Identify the need and procure necessary equipment for ensuring safety of health facility structures from disasters
- Identify or create damage proof rooms and buildings within hospitals that can be used as evacuation shelter during an emergency.
- Ensure that hospital staff are aware of the hospital rooms and buildings which are damage proof.

Actions Before Disaster / Epidemic (Preparedness)

- Within the affected district all available personnel will be made available to the District Disaster Manager (District Magistrate). If more personnel are required, then out-of-station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager (District Collector).
- Establish radio communications with
    - Emergency Operations Centre
    - Divisional Commissioner
    - District Control Room and
    - Veterinary aid Centres and Hospitals (including private practitioners) within the division.
- Appoint one officer as "Nodal Officer - Veterinary Services" at the State Level.
- The District Animal Husbandry Officer will act as "Officer-in-Charge - Veterinary Services" at the District Level.
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Stock emergency medical equipment, which may be required after a disaster.
- Determine what injuries illnesses may be expected, and what drugs and other medical items will be required, in addition to requirements of setting up cattle camps, and accordingly ensure that extra supplies of medical items and materials can be obtained quickly.
- Provide information to all staff of veterinary hospitals and centres about the disasters, likely damages and effects, and information about ways to protect life, equipment and property.
- Surgical packs should be assembled and sterilised.
- Enough stock of surgical packs should be sterilised to last for four to five days.
- The sterilised surgical packs must be stored in protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.

- All valuable equipment and instruments should be packed in protective coverings and stored in the most damage-proof room.
- All electrical equipment should be unplugged when disaster warning is received.
- Check the emergency electrical generator, to ensure that it is operational, and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one on loan. Arrange for emergency supplies of anaesthetic drugs.
- Check stocks of equipment and drugs, which are likely to be most needed after the disaster.
- Request central warehouses for immediate dispatch of the needed drugs to the hospital on an emergency priority basis.
- Fill hospital water storage tanks and encourage water savings. If no storage tanks exist, water for drinking should be drawn in clean containers and protected.
- Prepare an area of the hospital for receiving large number of livestock.
- Develop emergency admission procedures (with adequate record keeping).
- Cattle camps and hospital administrators should
    - Establish work schedules to ensure that adequate staff are available
    - Set up teams of veterinary doctors, and assistants for visiting disaster sites.

Actions During Disaster / Epidemic (Response)

Actions to be taken by the various agencies during a disaster or epidemic situation are listed here.

- Organise transfer of seriously injured livestock from villages to veterinary aid centres wherever possible.
- The provision of medical services should be coordinated by the District Animal Husbandry Officer with District Control Room, SOCs and cattle camps.
- Establish cattle camps and additional veterinary aid centres at disaster sites and designate an Officer-in-Charge for the camp.
- Estimate the requirement of water, fodder and animal feed, for cattle camps and organise the same.
- Ensure that adequate sanitary conditions are maintained through cleaning in order to avoid outbreak of any epidemic.
- Carryout culling of birds if necessitated.
- An injury and disease monitoring system should be developed, to ensure that a full picture of risks is maintained.
- Plan for emergency accommodations for veterinary staff from outside the area.
- Information formats and monitoring checklists as given in Annexure should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.
- Establishment of a Public Information Centre with a means of communication, to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential and limitations, in disaster situations.
- The local police and rescue groups should be aware of the resources of each veterinary aid centres and hospital.

Actions After Disaster / Epidemic (Recovery)

- Disinfect hospital premises and public areas
- Safe disposal of scattered animal carcasses
- Replenish stock of medicines, tools and accessories in hospitals
- Hold meetings with staff and discuss the departments' performance
- Draw lessons from the performance and identify actions to be taken for future improvement
- Implement action plan for improving future performance.

Action Plan for Animal Epidemics

Mitigation Action Plan

Disaster mitigation refers to the activities that need to be undertaken in order to avoid a future disaster or to reduce the negative impact of a future disaster. In this case, the government should plan for the following:

Veterinary Hospital and Laboratory Buildings

- Identify the epidemic prone areas and assess the medical response capability in the area and assess the requirement and feasibility
- Set up new veterinary hospitals or upgrade existing ones as needed
- Set up new laboratories or upgrade existing ones
- Review the need for vehicles for transportation of animals
- Conduct surveys for the structural safety of animal health facilities in the earthquake prone areas. Identify vulnerable buildings and making them safe by retrofitting.
- Similarly identify animal health facilities in the flood prone areas. Take up necessary mitigation measures like relocation, or strengthening etc.
- Survey the animal health facilities for their non-structural safety. Take up necessary non-structural mitigation measures.

Animal Husbandry Department shall review the above requirements on a yearly basis and complete the following Table as a part of the planning process:

Name of the District	Facility to build/ repair/ retrofit/ upgrade/ non-structural mitigation work	Location	Size and requirements	Cost estimates	Reason for demand

Equipment & Vehicles

- Identify the requirements of equipment including vehicle for effective medical response and take stock of the existing equipment, vehicle etc., and arrive at the gap.
- Plan necessary strategy for closing the gap by purchase, hire, or even requisitioning them from private sources.

Animal Husbandry Department shall review the above requirements on a yearly basis and complete the following Table as a part of the planning process:

Equipment required	Purpose	Where is it to be given	Cost	To be procured	To be hired	To be requisitioned from private

Manpower

- Plan the personnel requirement including doctors, specialists, and support medical staff for effective management of animal epidemic situation.
- Assess the existing manpower and identify the gap.
- Work out the method of closing the gap by recruiting, hiring or taking private sector help including volunteers.

Animal Husbandry Department shall review the above requirements on a yearly basis and complete the following Table as a part of the planning process:

Type of personnel required	Number	To be recruited	To be made available from private	Volunteers	Estimated expenditure

Manuals & Guidelines

- Plan who will prepare manuals and guidelines and when.

Animal Husbandry Department shall review the above requirements on a yearly basis and complete the following Table as a part of the planning process:

Type of manual required	For whom	How many to be printed	How to distribute	Estimated cost	Remarks

Awareness Materials

- Plan awareness activities such as preparation of awareness creation materials, do's and don'ts in the form of pamphlets, booklets, audio-visual material, etc., for various types of animal health related disasters targeting various groups of people such as women, community, children, farmers, traders, etc.

Animal Husbandry Department shall review the above requirements on a yearly basis and complete the following Table as a part of the planning process:

Type of material	Target population						Estimated Cost
	Farmer Community	Livestock Traders	General public	Government employees	Women	Children	
Pamphlets							
Booklets							
Video							
Audio							

Capacity Building

- Develop disaster management plan for all veterinary hospitals. Provide training to staff on veterinary hospital disaster management plan.
- Assess the existing capability of the officers, doctors and staff; identify the gaps for effective response and plan out the training programmes.
- Identify the agency that can give training for doctors, nurses, and other health workers. Plan for preparation of training materials and actual conduct of training.
- Plan training and capacity building programmes.
- Plan to conduct mock evacuation drills in hospitals.

Animal Husbandry Department shall review the above requirements on a yearly basis and complete the following Table as a part of the planning process:

Category which needs training	Type of training	Estimated cost	Remarks

Budget

- Once all the above mitigation measures are identified the estimated budget for each activity should be done and finally the total budget for the entire mitigation phase should be arrived at. The sources of funding should also be worked out.
- Some of the activities can be taken up in the regular budget of the ministry and the additional requirement should be calculated and it should be taken up with the government for additional grant for mitigation activities.

Type of activity undertaken in mitigation	Estimated cost	Source	Additional funding requirement

Preparedness Action Plan

Preparedness activities will comprise all activities that should be done in preparation to meet the response and immediate relief requirements in the event of a disaster. The Animal Husbandry Department will be required to quickly respond to outbreak of an animal epidemic in the aftermath of any disaster or due to introduction of any exotic animal disease that is identified by disease surveillance programme. In this stage, the government should plan the following activities before an epidemics outbreak. The following preparedness actions should be taken before an expected epidemic season.

State Level Action

- Appoint one officer as "Nodal Officer - Veterinary Services" at the State Level.
- Call for reports from district animal health officials on preventive actions planned in the districts.
- Identify gaps in district resources and list the supports needed for the districts.
- Issue instructions to district animal health officials to be observed for effectively managing the epidemic situation and ensure compliance.
- Supply the necessary stock of medicines and other medical supplies to district health facilities.
- Mobilize additional vehicles and place them in remote areas from where animals may have to be quickly transported to hospitals.
- Instruct all staff not to avail leave during the emergency period.

District Level Action

- The District Animal Husbandry Officer will act as "Officer-in-Charge - Veterinary Services" at the District Level.

- Critically analyse the available medical resources within the district and share them with the neighbouring districts. This is aimed at the networking of facilities between districts including veterinary hospital facilities, vehicles, special medical equipment, trained manpower like quick reaction medical teams (QRMT), etc.
- Within the affected district all available personnel will be made available to the District Disaster Manager (District Magistrate). If more personnel are required, then out-of-station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager (District Magistrate).
- Establish radio communications with
    - Emergency Operations Centre
    - Divisional Commissioner
    - District Control Room and
    - Veterinary aid Centres and Hospitals (including private practitioners) within the division.
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Stock emergency medical equipment, which may be required after a disaster.
- Determine what injuries illnesses may be expected, and what drugs and other medical items will be required, in addition to requirements of setting up cattle camps, and accordingly ensure that extra supplies of medical items and materials can be obtained quickly.
- Provide information to all staff of veterinary hospitals and centres about the disasters, likely damages and effects, and information about ways to protect life, equipment and property.
- Surgical packs should be assembled and sterilised.
- Enough stock of surgical packs should be sterilised to last for four to five days.
- The sterilised surgical packs must be stored in protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.
- All valuable equipment and instruments should be packed in protective coverings and stored in the most damage-proof room.
- All electrical equipment should be unplugged when disaster warning is received.
- Check the emergency electrical generator, to ensure that it is operational, and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one on loan. Arrange for emergency supplies of anaesthetic drugs.
- Check stocks of equipment and drugs, which are likely to be most needed after the disaster.
- Request central warehouses for immediate dispatch of the needed drugs to the hospital on an emergency priority basis.
- Fill hospital water storage tanks and encourage water savings. If no storage tanks exist, water for drinking should be drawn in clean containers and protected.
- Prepare an area of the hospital for receiving large number of livestock.
- Develop emergency admission procedures (with adequate record keeping).
- Cattle camps and hospital administrators should
    - Establish work schedules to ensure that adequate staff are available
    - Set up teams of veterinary doctors, and assistants for visiting disaster sites.

Hospital Level Action

- Provide information to all hospital staff about the disasters, likely damages and effects, and information about ways to protest equipment and property.
- Make space in the hospital for accommodating new animals (sick or injured) expected due to epidemics or disaster. Get support of private hospitals.
- The safest rooms are likely to be:
    - On ground floor
    - Rooms in the centre of the building away from windows
    - Rooms with concrete ceilings.
- Surgical packs should be assembled and sterilized.
- A large enough number should be sterilized to last four to five days.
- The sterilized surgical packs must be stored in protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.
- All valuable instruments should be packed in protective coverings and stored in rooms considered to be the most damage-proof.
- Protect all immovable equipment by covering them with tarpaulins or polythene.
- All electrical equipment should be unplugged when disaster warning is received
- Check the emergency electrical generator to ensure that it is operational and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one on loan.
- All fracture equipment should be readied.
- If surgery is to be performed following the disaster, arrange for emergency supplies of anaesthetic injections
- Check stocks of equipment and drugs, which are likely to be most needed after the disaster.
- Assess the level of medical supplies in stock, including
- Request central warehouse for immediate despatch of supplies likely to be needed to hospitals on an emergency priority basis.
- Fill hospital water storage tanks and encourage water savings. If no storage tanks exist, water for drinking should be drawn in clean containers and protected.
- Water purification tablets should be stocked
- Prepare an area of the hospital for receiving large number of animal casualties
- Hospital administrators should
    - Establish work schedules to ensure that adequate staff are available for in-patient needs
    - Organise in-house emergency medical teams to ensure that adequate staff are always available to handle emergency casualties.
    - Set up emergency quick response teams for visiting disaster sites.
- The equipment available should be checked once in a year and the competent authority should issue certificate of fitness.
- If equipment are found dysfunctional then repairs should be made and kept ready.

Type of equipment	Location	Checking and certifying authority	Time of testing	Requirement of repair	Estimated cost	Source of funds

Response Action Plan (During Disaster)

- Organise transfer of seriously injured livestock from villages to veterinary aid centres wherever possible.
- The provision of medical services should be coordinated by the District Animal Husbandry Officer with District Control Room, SOCs and cattle camps.
- Establish cattle camps and additional veterinary aid centres at disaster sites and designate an Officer-in-Charge for the camp.
- Estimate the requirement of water, fodder and animal feed, for cattle camps and organise the same.
- Ensure that adequate sanitary conditions are maintained through cleaning in order to avoid outbreak of any epidemic.
- Carryout culling of birds if necessitated.
- An injury and disease monitoring system should be developed, to ensure that a full picture of risks is maintained.
- Plan for emergency accommodations for veterinary staff from outside the area.
- Information formats and monitoring checklists as given in Annexure should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.
- Establishment of a Public Information Centre with a means of communication, to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential and limitations, in disaster situations.
- The local police and rescue groups should be aware of the resources of each veterinary aid centres and hospital.

Response Action Plan for Disease Eradication

In an eradication campaign, activities carried out in designated disease control zones are described below.

Actions at Infected Premises

It is here that the disease has been detected and includes all areas where there are susceptible animals that could have become infected through contact with the diseased animals. The premises may be a single farm, household or herd/flock, but could also be an entire village, settlement, common grazing land or even livestock sale yards. Activities to be undertaken are listed below.

- The infected premises are immediately quarantined with a complete ban on the movement in or out of susceptible species animals, animal products and potentially contaminated materials. Where necessary, this may be supported by disinfection/ decontamination of persons, vehicles, equipment and other materials leaving the premises.
- All susceptible species animals are immediately slaughtered, whether they are obviously infected or not. The animals should be slaughtered by methods that take account of animal welfare concerns and the safety of operatives. Rifles, captive-bolt guns or lethal injections (e.g. barbiturates) are most commonly used. For poultry, gaseous mixtures are often the preferred method. A mixture of at least 70 percent carbon dioxide in air in a sealed container is the most efficient, although carbon monoxide from vehicle exhaust pipes may also be used (provided adequate safety precautions are taken). Neck dislocation, either by hand or by mechanical devices may also be used for birds.
- Carcasses of all animals that have either been slaughtered or have died naturally of the disease are disposed of safely so that they no longer constitute a risk for further spread of the pathogen to other susceptible animals either by direct or indirect means, e.g. by carrion eaters or scavengers or by contamination of food or water. This is most usually achieved by deep burial (depending on such factors as the nature of the terrain, closeness of water-tables to the surface and availability of earth-moving equipment) or by burning (depending on such factors as availability of suitable fuels and the danger of starting grass or bush fires). If *in situ* disposal is not practical it may be possible to transport carcasses to a common disposal point in sealed vehicles. This should be done within the infected area. Rendering of carcasses may also be satisfactory provided destruction of the pathogen can be guaranteed. Incineration is generally too expensive, except in special circumstances, e.g. for BSE. It may also be necessary to dispose safely of potentially contaminated animal products held on infected premises, e.g. meat, hides, wool, dairy products or eggs, depending on whether such products constitute a risk for transmission of infection.
- Premises must be decontaminated. The environs of the infected premises, particularly where animals have congregated, must be thoroughly cleaned and disinfected. This includes animal houses, sheds, pens, yards, water troughs, etc. Potentially contaminated materials such as manure, bedding, straw and feedstuffs should be removed and disposed of as for carcasses. Appropriate disinfectants must be selected for each disease. These may consist of soaps and detergents, oxidizing agents, alkalis, acids and/or aldehydes. Insecticides should also be used to prevent the transfer of contamination by flies.
- After slaughter, disposal and decontamination procedures are completed, and the infected premises are left destocked for a period that is determined by the estimated survival time of the pathogen in the particular environment. As a rule, this is shorter in hot climates than in cold or temperate climates. However, a minimum for any disease is 21 days.
- Partial or complete restocking of susceptible animals in the infected premises is then allowed. However, these animals are kept under close surveillance and, provided there is no evidence of infection for a period equivalent to, say, two incubation periods for the disease, the premises may be released completely from quarantine.

Actions at Dangerous Contact Premises

These are premises where overt disease has not yet appeared, but for which epidemiological investigations indicate that there is a high likelihood that infection has been introduced. This circumstance might occur with an immediate neighbour to infected premises that have introduced animals from infected premises during the critical period for transfer of infection. A worst-case scenario of a highly contagious disease being detected in a livestock market may lead to many dangerous contact premises.

These premises are put under the same tight quarantine as infected premises and are subject to intense surveillance (at least daily). Provided there is no evidence of infection, they may be released from quarantine after a period equivalent to at least two quarantine periods for the disease.

In certain circumstances a decision may be taken to slaughter animals from dangerous contact premises.

Actions at Infected zone

This is the area immediately surrounding infected premises. While its size and shape are influenced by topographical features, physical barriers, administrative borders and epidemiological considerations, OIE recommends that it should be at least a 10-km radius around a disease centre in areas with intense livestock raising and 50 km in areas where extensive livestock raising is practised. Activities to be undertaken are listed below.

- Strict controls should be maintained on the movement of susceptible species animals and potentially contaminated animal products into or out of the infected zone. These should preferably be banned or only allowed in circumstances where there is no risk of further transmission of infection. An example might be the direct transport of apparently healthy animals to an abattoir for immediate slaughter, in the case of disease agents that are not transmitted by meat (e.g. CBPP and rinderpest). Local salvage could be considered for such diseases if warranted by circumstances.
- Intensive surveillance is undertaken, ideally involving daily clinical inspection of susceptible species animals on all farms or other livestock premises in the zone. Inspection teams should wear protective clothing and practise good personal disinfection when leaving the premises. If wildlife or feral animals are likely to be involved, arrangements should be made with wildlife authorities for disease surveillance to be undertaken. In the case of avian diseases, arrangements may be made for a daily dead bird pick-up service (in sealed plastic garbage bags or the equivalent) from poultry farms, with these being taken back to the laboratory for autopsy and diagnostic tests. Surveillance should also be extended to include commercial and hobby aviaries.
- Closure of livestock markets and other congregations of susceptible species (e.g. race meetings and livestock). A decision on whether to close risk enterprises, such as abattoirs and dairy factories located in the infected zone, should be made after careful consideration of epidemiological and other factors, i.e. whether they constitute a significant threat for further spread of the disease. However, in some cases, there could be advantages in keeping the enterprise open, as this tends to keep animals within the zone and retain the economic viability of the affected community. Strict zoo-sanitary codes of practice should be enforced in this case.
- Publicity campaigns should be carried out to inform people of the nature of the disease and of the restrictions in place.

The infected zone should be left in place for as long as can be reasonably expected, based on epidemiological evaluations, that infection may still be present. However, there is a risk in maintaining restrictions for too long as resentment may build up in the community, with a resulting reluctance to maintain the livestock movement bans and other restrictions.

Actions at Surveillance or Control Zone

This zone is much larger and surrounds one or more infected zones. It may cover a whole province or administrative region (or clan or tribal area). Activities undertaken are described below.

- There is enhanced active disease surveillance in the control zone. Herds and flocks should be inspected at about weekly intervals and this inspection should be supplemented by serological surveys.
- Livestock movements into or out of the control zone are allowed, but livestock movements out of the control zone should be subject to permits after clinical examination of the animals.
- Risk enterprises can operate but are subject to strictly enforced zoo-sanitary codes of practice.
- Livestock markets and other congregations of animals should be suspended if they are considered to constitute a considerable threat for the further spread of the disease. If they are allowed to continue, they should be subject to surveillance and rigidly enforced codes of practice.
- Publicity campaigns should be carried out.

Vaccination

Well-planned, comprehensive vaccination programmes, supplemented by other disease control measures, can go a long way towards eliminating many epidemic livestock diseases. This may be the strategy of choice in areas where large-scale eradication is unacceptable for one reason or another. Vaccination programmes may be used as a tool for the elimination of epidemic livestock diseases in different ways, as described below.

Ring Vaccination

Ring vaccination is the rapid creation of an immune belt around an infected area and may be carried out to contain a rapidly spreading epidemic disease outbreak or in situations where the effectiveness of other methods to prevent the spread of the disease in and around infected zones, e.g. quarantine and livestock movement controls, cannot be guaranteed, or where these areas may be relatively inaccessible.

A decision to implement ring vaccination needs to be made quickly or else the size and number of infected areas may make this unmanageable. The width of the immune belt should be determined by epidemiological factors and resource availability considerations but, as a general guide, should be of the order of 20 to 50 km. Speed is of the essence and vaccination in the target ring should ideally be completed within a week or so. It is preferable to select a narrower ring for which human resources, vaccines and other resources are available for comprehensive vaccination within this time frame rather than to select a larger ring where gaps may be left in the immune belt for longer periods. The vaccination ring would then be extended later as necessary. Having selected the target area for the ring, vaccination should commence at the outer circumference and move centripetally towards the infected herds or flocks. Separate vaccination teams should be used for herds/flocks in which there is a high suspicion of infection.

Ring vaccination should be supplemented by other disease control measures including disease surveillance, livestock movement controls and, where possible, quarantine of infected premises. The movement of susceptible species animals into or out of the combined infected/ring vaccination zones should not be permitted. Livestock markets and other congregations should also be suspended in this area.

Intensive disease surveillance should be carried out within and around the infected/ring vaccination, with the greatest concentration of effort being in the area immediately surrounding the vaccine ring.

A decision could be taken to extend the vaccination ring inwards or, if necessary, to have a second outer vaccination ring.

Blanket Vaccination

This involves the comprehensive vaccination of all susceptible species animals over a larger area. It may be the preferred option when the disease outbreak has become well established and there are multiple foci of infection, or when other disease control methods are impractical for one reason or another. The vaccination area should cover known and suspected infected areas together with those areas considered to be at high risk for spread of the disease.

The latter may include known livestock movement routes. It may be necessary to carry out several rounds of vaccination over a few years in the target area, until the clinical disease apparently disappears, or the incidence is at least reduced to a level where other disease control measures can be followed.

The vaccination campaign should be supplemented by heightened disease surveillance activities both inside and outside the vaccination area(s), together with publicity programmes. The movement of animals from vaccinated areas to disease-free areas should be regulated in such a way as to minimize the possibility of spread of infection.

Whichever vaccination programme is selected, the following guidelines should be followed:

- The purposes of the vaccination programme should be carefully defined, and the programme targeted to meet the desired objectives.
- Having selected the target animal population and area, the vaccination should be carried out as comprehensively as possible, with the target as close to 100 per cent vaccination cover as practicable.
- Different vaccination teams should be used for herds/flocks that are known or thought to be infected and those that are thought to be free. This is to minimize the possibility of spread of the disease.
- For the same reason, groups of animals from different herds should not be congregated together for vaccination.
- Vaccinated animals should be permanently identified as such, even if this involves something as simple as ear notching.

Mixed Strategies

Although the previous two strategies have been presented as alternatives, they are not mutually exclusive. It is quite sound to combine elements of both to suit different epidemiological or resource availability circumstances or to suit different phases of an eradication campaign.

For example, it may be decided to slaughter infected herds or flocks and then to use ring vaccination in a control zone around them, or targeted vaccination in other strategically important areas. One disadvantage is that it will complicate the interpretation of disease surveillance, particularly that of serological surveys. However, a combination of eradication and vaccination may well be selected in a number of areas where there may be some doubt about the ability to maintain strict quarantine or animal movement controls or where there are inadequate resources for comprehensive disease surveillance. Vaccination may also be used to dampen down the rate of spread of an epidemic disease to the point where "stamping out" can be applied.

Type of activity undertaken in response	Estimated cost	Source	Additional funding requirement

Recovery Action (After Disaster)

- Disinfect hospital premises and public areas
- Safe disposal of scattered animal carcasses
- Replenish stock of medicines, tools and accessories in hospitals
- Hold meetings with staff and discuss the departments' performance
- Draw lessons from the performance and identify actions to be taken for future improvement
- Implement action plan for improving future performance

Type of activity undertaken in recovery	Estimated cost	Source	Additional funding requirement

Annexure: Standards for Cattle Camps

(may be decided according to the local standards)

- The minimum number of cattle in the cattle camp should be about 100 and the maximum 500.
- The cattle camps should be located at suitable sites, bearing in mind that adequate supply of water and shade are most essential for the wellbeing of the cattle.
- Cattle sheds constructed should not exceed 20 sq. ft. per animal. Suitable arrangements for water trough and manger(s) should be made.
- The feeding centres for cattle should be in such a manner that
    - There is adequate supply of drinking water
    - There is enough shade for cattle to rest during the afternoon
    - They are located as near the rail head as possible
    - They are conveniently located, not beyond a radius of 8 km from the affected villages.
- The cattle will require 6 kg per cattle head per day of fodder, and 1 to 1½ kg per cattle head per day of concentrate.
- Each cattle camp will have a minimum of one camp manager, two labourers and two sweepers.

Annexure: Preparedness Checklist for Animal Husbandry Department

(to be filled in by the Department Head and submitted to the District Collector before specified month when animal epidemics are expected to occur, or as required)

Preparedness measures taken	**Details/Remarks**
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated • Precautionary measures and procedures • The precautions to be taken to protect equipment • The post-disaster procedures to be followed.	
Hospital staff are aware of which hospital rooms / buildings are damage-proof.	
All veterinary hospitals and centres staff informed about the possible disasters, likely damages and effects, and information about ways to protect life, equipment and property.	
An area of the hospital identified for receiving large number of livestock.	
Emergency admission procedures with adequate record keeping developed.	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By:

Signature:	Date:
Designation:	Place:

Annexure: Preparedness Checklist for Field Activities of Animal Husbandry

(to be filled in by the Officer-in-Charge and submitted to District Control Room and the Department Head)

Actions Taken	Y/ N	Details/ Remarks
Radio communications established with • Emergency Operations Centre • District Magistrate • District Control Room • Veterinary aid centres and • Hospitals (including private practitioners) within the division		
The District Animal Husbandry Officer designated as OFFICER-IN-CHARGE-Veterinary Services.		
Emergency medical equipments required are stocked.		
All veterinary hospitals and centres staff informed about the disasters, likely damages and effects, and ways to protect life, equipment and property.		
Emergency electrical generator arranged.	.	
Emergency supplies of anaesthetic drugs arranged.		
Hospital water storage tanks filled		
An area of the hospital prepared for receiving large number of livestock		
Emergency admission procedures developed (with adequate record keeping).		
Transfer of seriously injured livestock from villages to veterinary aid centres and hospitals organised.		
Established at disaster sites • Cattle camps • Additional veterinary aid centres.		
Organised for cattle camps • Water • Fodder and • Animal feed.		
Adequate sanitary conditions maintained		
Cleaning operations being carried out		
Epidemiological surveillance is being undertaken		
Emergency accommodations available for veterinary staff from outside the area.		

Public information centre established.		
The local police, and rescue groups informed of the resources of each veterinary aid centre and hospital.		

Inspected By:

Signature:	Date:
Designation:	Place:

KERALA STATE DISASTER MANAGEMENT AUTHORITY

Observatory Hills, Vikas Bhawan PO, Thiruvananthapuram, Kerala

keralasdma@gmail.com | www.sdma.kerala.gov.in