

Handbook on Disaster Management

Volume 2

EMERGENCY OPERATIONS CENTRES & EMERGENCY SUPPORT FUNCTIONS PLAN KERALA

Towards a safer state...



Handbook on Disaster Management
Volume 2
Edition 2

**Emergency Operations Centres
&
Emergency Support Functions Plan
Kerala**



Towards a Safer State...

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Edition

Second Edition, October 2016
First Edition, February 2015; Pages: 59

Published by

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Version information

Second edition: Approved by the State Executive Committee of Kerala State Disaster Management Authority in its meeting held on 20th October 2016. Funded by Kerala State Disaster Management Authority. Second edition published to incorporate changes recommended by Government and to streamline as per the approved State Disaster Management Plan, 2016. The revised edition contains the following additional items which are approved vide GO (Rt) No. 3667/2016/DMD dated 9th September 2016 in the State Disaster Management Plan:

1. Nodal departments as identified in Section 5.1 of the State Disaster Management Plan
2. Process for emergency management of events with and without early warning
3. Standard Operating Procedure for space debris handling
4. Standard Operating Procedure for high wave warnings
5. Standard Operating Procedure for industrial accidents and petro-chemical transportation accidents
6. Inclusion of the role of Oil Companies in the event of petrochemical accidents and petrochemical transportation accidents

First edition: Approved by the State Executive Committee of Kerala State Disaster Management Authority in its meeting held on 29th January 2015. Prepared with the financial support of 'Govt. of India (GoI) - United Nations Development Programme (UNDP) Project on Enhancing Institutional and Community Resilience to Disasters and Climate Change (2013 – 2017)' under the Annual Working Plan of 2014.

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1. Introduction

Kerala is a multi-hazard prone state. The state is frequently ravaged by the disastrous consequences of coastal erosion, lightning, landslides, floods, drought and petro-chemical transportation related accidents. Other relatively less frequent but significant phenomenon capable of causing disastrous consequences are windfall of trees, earthquakes, intense rainfall, pest attack, forest fire, chemical transportation and storage related accidents. The high density of population of 860 people/km² (2011 Census), narrow roads, high density of road network, density of coastal population and the general higher standard of living of the public as compared to the rest of the country are factors that increase the vulnerability of the population to disasters.

The Kerala State Disaster Management Authority (KSDMA) was constituted in 2007 and District Disaster Management Authorities (DDMA) in 2008 as envisaged in the Disaster Management Act, 2005 (DM Act, 2005). The KSDMA has, as envisaged in the DM Act, 2005, constituted the State Executive Committee (SEC) chaired by its Chief Executive Officer (*inter-alia* Chief Secretary) and the executive management of the authority is vested with the Principal Secretary, Revenue and Disaster Management (*inter-alia* State Relief Commissioner according to

Levels of Disasters

- **L0: Normal times; focus on preparedness activities**
- **L1: Disasters that can be managed at the district level; state and centre in ready state**
- **L2: Disasters that require mobilization of resources at the state level**
- **L3: Disasters that require mobilization of resources at the national level**

(NDMA, 2007)

State DM Policy 2010). Vide GO (Ms) No. 68/2011/DMD dated 08/02/2011 a State Level Crisis Management Committee was formed for addressing all Natural disasters with the Chief Secretary as the chairperson. Vide GO (Rt) No. 6410/2013/DMD dated 29/11/2013, the State Executive Committee of KSDMA decided to form a Crisis Management Group specifically for Anthropogenic Hazards with the Home Secretary of the state as the chairperson.

A well-coordinated and unified response of various departments of the State, its agencies, the Central Government, its departments and agencies appropriate to the demands of the district administration in the management of disasters will minimize loss of time wasted in response and improve the process of recovery. Recognizing the need for such a state-level dedicated facility for disaster management, the Government of Kerala (GoK) has established the State Emergency Operating Centre (SEOC). The SEOC is envisaged to cater to varying levels of disasters with a state-of-the-art Decision Support System (DSS), integrated with multichannel communication network. Necessary funds have been apportioned by GoK for constructing a dedicated building for housing the SEOC. The Government has also provided

funds to scale up and strengthen the Control Rooms in the district collectorates as District Emergency Operations Centres (DEOC). All district collectorates, taluks and 295 hazard prone villages are equipped with dedicated Very High Frequency (VHF) radio network exclusively for Disaster Management, in addition to the availability of telephone and fax, thus ensuring maximum redundancy for ensuring connectivity. The EOCs are part of the national emergency communication plan and will be located at the State Head Quarters, all District Head Quarters and On-Site of Emergency (Mobile EOC). A mobile emergency operations centre will be activated only during the time of major emergencies and the state is yet to be equipped with one such facility.

1.1. EOC as a war room

As would be clear in the succeeding chapters, the EOCs are the nerve centres of disaster preparedness planning, early warning, emergency management, recovery management and mitigation planning. It is envisaged to be housed in a structure which is multi-hazard resistant. It is a repository of all the information and decision support system for the Incident Commander (IC). The EOC would be a place where all the information from the disaster site would pour in and be compiled and processed for decision making. It would provide a place for the Incident Commanders and Emergency Support Function (ESF) nodal officers of departments to assemble therein as per the ESF plan (Annexure I), take stock of situation, and coordinate response during emergencies. It is also envisaged that in case the main EOC is damaged during a disaster, the IC and ESF nodal officers have already identified an alternative EOC.

Incident Commanders	
State incident commanders	
<ul style="list-style-type: none"> ▪ Chief Secretary (Chief Executive Officer, SDMA) ▪ State Relief Commissioner (Principal Secretary, Revenue and Disaster Management; Convenor, SDMA) 	
District incident commander	
<ul style="list-style-type: none"> ▪ District Collector (Chairperson, DDMA) 	

It is widely noted that communication systems are the first to be affected in the event of a calamity. This is owing to multiple reasons including damages to communication infrastructure and the high rate of traffic that may arise due to affected parties attempting to seek for rescue. According to DM Act, 2005, Section 22 (2) p, the State Executive Committee shall “ensure that communication systems are in order”. Hence, all EOCs should have built-in redundancy of different layers of communication networks as per the National Emergency Communication Plan. Keeping communication system in order even during the most adverse circumstances would be one of the main functions of the EOC.

2. Organizational set-up of EOCs

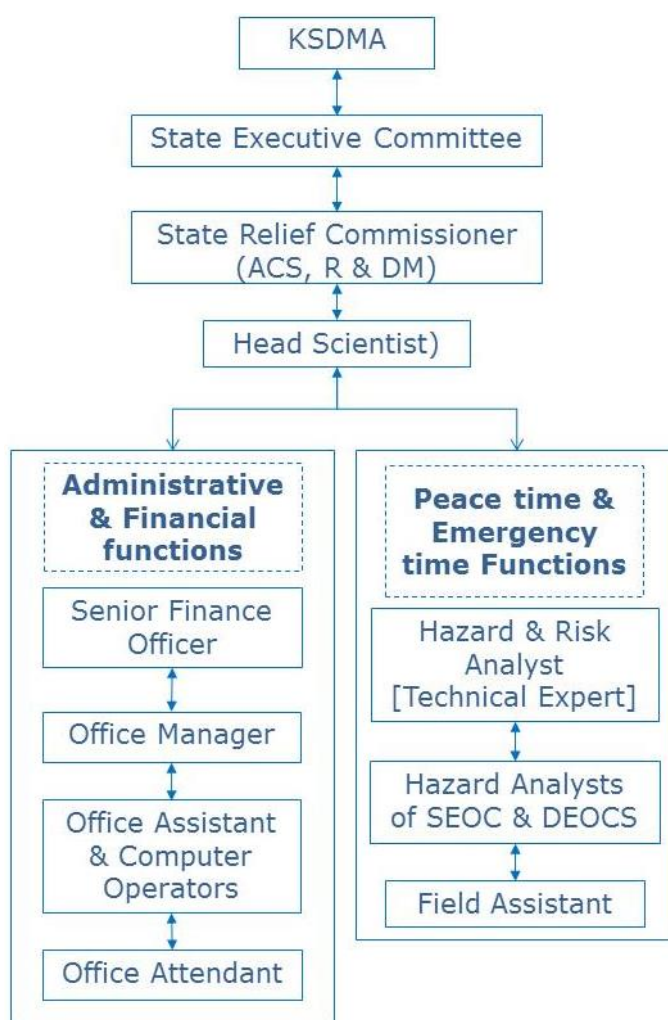
2.1 State Emergency Operations Centre

Established vide Section 6.8 of KSDMPo, 2010 and as provided in the *National Disaster Management Guidelines - National Disaster Management Information and Communication System, 2012* based on direction vide Letter No. 05-03/2013/NDMA/CBT (Pt) dated 7th October 2013 by National Disaster Management Authority as determined by the State Executive Committee and the Government vide powers vested on it under Section 69 and Section 16 of DM Act, 2005, respectively.

Recognizing the necessity of conducting and continuously updating HVRA in the state, the GoI-UNDP Disaster Risk Reduction Programme in collaboration with the Department of Revenue and Disaster Management conducted a consultation workshop on 4-5 October 2010. Based on the conclusions and recommendations of this national workshop, the Department of Revenue and Disaster Management in consultation with the Kerala State Council for Science, Technology and Environment created the HVRA Cell as the research and technical laboratory of KSDMA under the scientific supervision of the Centre for Earth Science Studies (CESS) in April 2011. The Cell became fully operational in March 2012.

On 20 January 2014 the Government converted HVRA Cell as the State Emergency Operations Centre (SEOC). The SEOC is also the research and technology laboratory of the SDMA and directly functions under the Additional Chief Secretary, Revenue & Disaster Management. All administrative

matters related to the SEOC are made by the State Executive Committee of KSDMA. Its day-to-day affairs are managed by Head, State Emergency Operations Centre.



It is also the State Drought Monitoring Cell [GO (Rt) No. 7228/2012/DMD dated 24/12/2012]. It is staffed with a multi-disciplinary scientific team, presently 16 members strong, spread over 6 districts. The SEOC implements a number of research and data collection projects and is also entrusted with the preparation of the State and District Disaster Management Plans. It also manages the GoI-UNDP project on Enhancing Institutional and Community Resilience to Disasters and Climate Change (2013–2017), Kerala.

The SEOC is permitted to collect any data from any Government Institution in the state on a no cost basis [GO (Rt) No. 3250/2011/DMD dated 29/07/2011]. The SEOC presently functions in the Institute of Land and Disaster Management. A new building with full-fledged state-of-the-art IT & Communication network for the SEOC is being built opposite to Kanakakunnu Palace in Thiruvananthapuram City. Once made operational, the building will house an intelligent decision support system enabling the prediction & early warning of major hydro-meteorological hazards and provide intelligent support for emergency operations.

SEOC is the ‘state nodal office for the collection, compilation and analysis of any data necessary for disaster risk assessment from all government departments and institutions on a no cost basis’.

Government Orders relevant to the creation and functions of SEOC are

Government Order Number	Purpose
GO (Rt) No. 2267/2011/DMD dated 20-04-2011	Formation of Hazard, Vulnerability and Risk Assessment Cell (HVRA Cell) and approval of the Project Execution Plan
GO (Rt) No. 3250/2011/DMD dated 29-07-2011	State Nodal Office for the collection, compilation and analysis of any data necessary for disaster risk assessment from all government departments and institutions on a no cost basis
GO (Rt) No. 1941/2012/DMD dated 31-03-2012	Revised Project Execution Plan defining the roles and functions of HVRA Cell
GO (Rt) No. 7228/2012/DMD dated 24-12-2012	Declaration as State Drought Monitoring Cell
GO (Rt) No. 416/2014/DMD dated 20-01-2014	Renaming of HVRA Cell as the State Emergency Operations Centre (SEOC)
GO (Rt) No. 2167/2016/DMD dated 19-03-2016	Streamlining the functions of SEOC

The State Emergency Operations Centre is headed by State Relief Commissioner (SRC) [*inter alia* Additional Chief Secretary, Revenue & Disaster Management] as prescribed in the *National Disaster Management Guidelines - National Disaster Management Information and Communication System, 2012*. The SRC is assisted by officers of the SEOC. The day-to-day functions of SEOC are managed by a Head (Scientist) and are assisted by a trained team of Hazard Analysts. The administrative and financial functions of the SEOC are regulated by the State Executive Committee through Additional Chief Secretary, Revenue and Disaster

Management as defined vide GO (Rt) No. 2167/2016/DMD dated 19-03-2016. Organogram of SEOC is as given here.

In peace time, staff of SEOC is engaged in the *peace time objectives* of the Centre, while in the time of emergencies the staff is engaged in the *emergency time objectives* of the Centre as defined in the Handbook on Disaster Management – Volume 2 – Emergency Operations Centres & Emergency Support Functions Plan, Kerala, 2015.

The SEOC is also the data fusion center and has high end Geographic Information Systems and Satellite Image Processing facilities. Advanced redundant satellite based communication network (National Disaster Management Services Project) and multi-channel terrestrial communications systems including VHF, GSM, 4G, 3G and broadband internet connectivity.

The present staff of SEOC is:

Sl. No	Designation	Strength
1	Head (Scientist)	1
2	State Project Officer	1
3	Hazard and Risk Analyst (Technical Expert)	1
4	Hazard Analysts - Three in SEOC and one each in Kollam, Idukki, Ernakulam, Thrissur, Kozhikode and Wayanad District Emergency Operations Centres	6
5	Field Assistant	1
Designation – Non-scientific Posts		
1	Office Manager	1
2	Office Assistant	1
3	Office Assistant cum Computer Operator	1
4	Computer Operator	1
5	Office Attendant	1
6	Driver	1

- Tele/Fax: +91 (0) 471 - 2364424
- Email: seoc.gok@gmail.com
- Website: www.disasterlesskerala.org
- Functioning hours: 10.00 am to 5.00 pm (24 x 7 in Monsoon Season)

Objectives of SEOC

- Conduct and regularly update the HVRA of the state
- Prepare the State and District DM Plans
- Conceptualize and implement hazard early warning systems
- Create and maintain the disaster database of the state
- Undertake research projects on topics relevant to disaster risk reduction
- Foster research collaboration with external agencies

- Emergency Coordination
- Preparation of calamity memoranda for submission to Government of India

SEOC has published the following:

- 1 Hazard Susceptibility Maps of the State are accessible from <http://disasterlesskerala.org/maps/>
- 2 Handbooks on Disaster Management and Standard Operating Procedures are accessible from <http://disasterlesskerala.org/handbooks/>
- 3 18 detailed investigation reports, particularly on anomalous natural phenomenon are accessible from <http://disasterlesskerala.org/investigation-reports/>
- 4 Scientific research outputs are accessible from <http://disasterlesskerala.org/ro/>
- 5 Calamity memoranda are accessible from <http://disasterlesskerala.org/cm/>
- 6 State and District Disaster Management Plans are accessible from <http://disasterlesskerala.org/disaster-management-plans/>
- 7 Information Brochures are accessible from <http://disasterlesskerala.org/brochures/>
- 8 Important Government orders are accessible from <http://disasterlesskerala.org/acts-rules-gos-dm-plans/>

The SEOC presently functions in the Institute of Land and Disaster Management. A new building with full-fledged state-of-the-art decision support system (DSS) for the SEOC has been approved by the Government vide G.O (Ms) No. 453/2014/DMD dated 30/12/2014. Once made operational, this DSS will enable the prediction & early warning of major hydro-meteorological hazards and provide support for emergency operations in the event of hazards recognized by Government of India as eligible for support from National Disaster Response Fund. The SEOC is envisaged to function 24 x 7 after the completion of the building and the commissioning of the decision support system.

2.2 State Control Rooms

According to the Kerala State Disaster Management Policy, 2010 (SDMA Policy, 2010), section 6.5 and the Kerala State Disaster Management Plan, 2016, Section 5.1, nodal departments have been identified for undertaking disaster risk reduction functions related to the respective disasters. According to Section 6.8 of SDM Policy, 2010 – Emergency Operations Centres, “all nodal departments are to establish control rooms in the event of disasters”. Two major departments that have to work in tandem for effective disaster risk reduction are the Department of Revenue & Disaster Management and the Department of Home. The control rooms of these departments function under the administrative control of the respective Department Heads, they being Commissioner Land Revenue and the Director General of

Police, respectively. The Control Rooms of Revenue & Disaster Management and Home function 24 hours.

Nodal Departments as identified in Section 5.1 of the State Disaster Management Plan 2016						
Sl. No	Category	Type	Preparedness	Response	Recovery	Mitigation
1	Natural Hazards	Flood	WR	LR	LR	WR
2		Landslides	LSG	LR	LR	LSG
3		Drought	WR	LR	LR	LSG & Agri
4		Coastal hazards	WR	LR	LR	WR
5		Wind	LSG	LR	LR	LSG
6		Lightning	LSG	LR	LR	LSG
7		Earthquakes	LSG	LR	LR	LSG
8		Human epidemics	HS	HS	HS	HS
9		Plant disease epidemics and pest attack on crops	AGD	AGD	AGD	AGD
10		Avian epidemics	AH	AH	AH	AH
11		Animal epidemics	AH	AH	AH	AH
12		Pest attack of human habitations	AGD	AGD	AGD	AGD
13		Forest Fire	FD	FD	FD	FD
14		Meteorite/asteroid impacts	LR	LR	LR	LR
15		Soil Piping	LSG	LR	LR	LSG
16		Heat wave/sunburn/sun stroke	LR & LD	HS	HS	LR & LD
17		Natural background radiation	HS	HS	HS	HS
1	Anthropogenic Hazards	Stampedes	P	P	P	P
2		Fire cracker accidents	LR & P	P & FS	P & FS	LR
3		Petro-chemical transportation accidents	P & OC	P & OC	P & OC	P & OC
3		Industrial accidents	PB & FB	PB & FB	PB & FB	PB & FB
4		Dam break	KSEB/WR	KSEB/WR	KSEB/WR	KSEB/WR
5		Dam spillway operation related floods & accidents	KSEB/WR	KSEB/WR	KSEB/WR	KSEB/WR
6		Oil spill	PB & OC	PB & OC	PB & OC	PB & OC
7		Road accidents involving civilian transport vehicles	P	P	P	P
8		Human induced forest fire	FD	FD	FD	FD
9	Human-animal	FD & LSG	FD & LSG	FD &	FD & LSG	

		conflicts			LSG	
10		Fire accidents in buildings and market places	LSG & FS	LSG & FS	LSG & FS	LSG & FS
11		Boat capsizing	TD, IND & KWTC	TD, IND & KWTC	TD, IND & KWTC	TD, IND & KWTC
12		Accidental drowning	SYW & TD	FS	FS	SYW & TD
13		Building collapse	LSG & PWD	FS	FS	LSG & PWD
14		Hooch accident	E	E	E	E
15		Air accidents	AAI	AAI	AAI	AAI
16		Rail accidents	IR	IR	IR	IR
17		Terrorism, riots and Naxalite attacks	P	P	P	P
18		Nuclear and radiological accidents	RS & BARC	RS & BARC	RS & BARC	RS & BARC
19		Space debris impacts	P	P	P	P
20		Biological accidents	HS, FSa	HS, FSa	HS, FSa	HS, FSa
21		Occupational hazards and recreational-area related hazards	LSGD, LD & TD	LSGD, LD & TD	LSGD, LD & TD	LSGD, LD & TD
22		Accidents in Armed Forces premises and assets	AF	AF	AF	AF
Disaster occurring outside the state premises in which tourists from Kerala of non-residential Keralaites are affected			SDMA of the Respective State and NORKA		As decided by SEC or KSDMA	
AAI: Airport Authority of India; AF: Armed Forces (Indian Army, Navy, Air Force, Coast Guard, Indo-Tibetan Board Police, Central Reserve Police Force; Defence Security Corps); AG: Agriculture Department; AH: Animal Husbandry; BARC: Baba Atomic Research Centre; E: Excise Department; FB: Factories and Boilers Department; FD: Forest Department; FS: Fire and Rescue Services; FSa: Food Safety; HS: Health Services; IND: Inland Navigation Department; IR: Indian Railway; KSEB: Kerala State Electricity Board Ltd.; KWTC: Kerala Water Transport Corporation; LD: Labour Department; LR: Land Revenue Department; LSG: Local Self-Government; P: Police; WR: Water Resources Department; OC: Oil Companies; PB: Pollution Control Board; PWD: Public Works Department; RS: Radiation Safety Department; SYW: Sports & Youth Welfare Department; TD: Tourism Department						

2.3 District Emergency Operations Centre

The DEOC is under the direct control of District Incident Commander. Day-to-day administration of the DEOC is delegated to the Deputy Collector (Disaster Management) [Deputy Collector (DM)] in Thiruvananthapuram, Pathanamthitta, Alappuzha, Ernakulam, Thrissur, Malappuram, Kozhikode and Kannur districts and to the Additional District Magistrate (ADM) in Kollam, Kottayam, Idukki, Palakkad, Wayanad and Kasargod. The

DEOCs function 24 hours. In most of the districts, the DEOC is presently a control room with limited facilities.

The first dedicated district emergency operations centre with 24 hours staff from Revenue, Police and Fire & Rescue with a full time medical doctor on-call started functioning at Alappuzha district on 5th September 2014. Presently all DDMA's have operation District Emergency Operations Centre.



3. Present emergency operations scenario

An evaluation was conducted at the state and district level in 2015 to understand the lacuna in emergency operations by visiting and interacting with State and District functionaries of emergency management. The following table compiles the present situation in brief.

Item	State Level	District Level
Understanding of DM Act, 2005	Poor	Poor
Understanding of roles & responsibilities of KSDMA	Moderate	Poor
Self-understanding of the roles & responsibilities of nodal departments in Emergency Management [Section 39 of DM Act, 2005]	Moderate	Poor
Understanding of the norms of National/State Disaster Response Fund	Poor	Poor
Understanding of the roles & responsibilities of Local Self Governments in Emergency Management [Chapter 6 of DM Act, 2005]	Poor	Poor
Interdepartmental knowledge regarding the structure & hierarchy of KSDMA in the State	Poor	Poor
Interdepartmental knowledge regarding the presence of Crisis Management Group in the State	Poor	Poor
Interdepartmental hierarchical issues	Moderate	Significant
Appointment of departmental nodal officers	Not in all departments	Not present
Approved Disaster Management Plans	<ul style="list-style-type: none"> • State DM Plan Profile published in 2012 • District Disaster Management Plans published in 2012 • District DM Plan revisions – ongoing; scheduled month of completion: December 2014 • Emergency Support Functions Plan – Draft completed; formal clearance expected by December 2014 • State DM Plan revision – ongoing; scheduled month of completion: June 2015 	
Approved Departmental Disaster Management Plans	None	
Availability of hardware for emergency management	Moderate	Poor
Availability of integrated and redundant alternate communication facilities	Moderate	Poor
Availability of an integrated emergency	Not present	

number		
GIS centric decision support system	Moderate	Poor
Availability of Standard Operating Procedures	<ul style="list-style-type: none"> • Present for LPG & Petro-chemical accidents • Not present for other disasters 	
Approved Emergency Support Functions Plan	Nil	
Availability of comprehensively trained Human Resource	Moderate	Poor
Community preparedness for emergency response	Significant lack of awareness	

3.1 Present Communication networks

Emergency communication between State and Districts EOCs are currently undertaken through four channels, they being 1) Landline based telephone, fax and email, 2) 3G based email, 3) GSM based group SMS and 4) Very High Frequency Radio network. The present system is manual and requires constant human intervention; full automation in dissemination of warning is not preferred as false alerts may lead to mistrust amongst executives and public. However, attempt is to automatize the decision making process and the standard operating procedures to be adopted in the event of the most frequent hazards that strike the state, and system generated previously agreed automated instructions for emergency management is expected to be issued to relevant agencies and line departments.

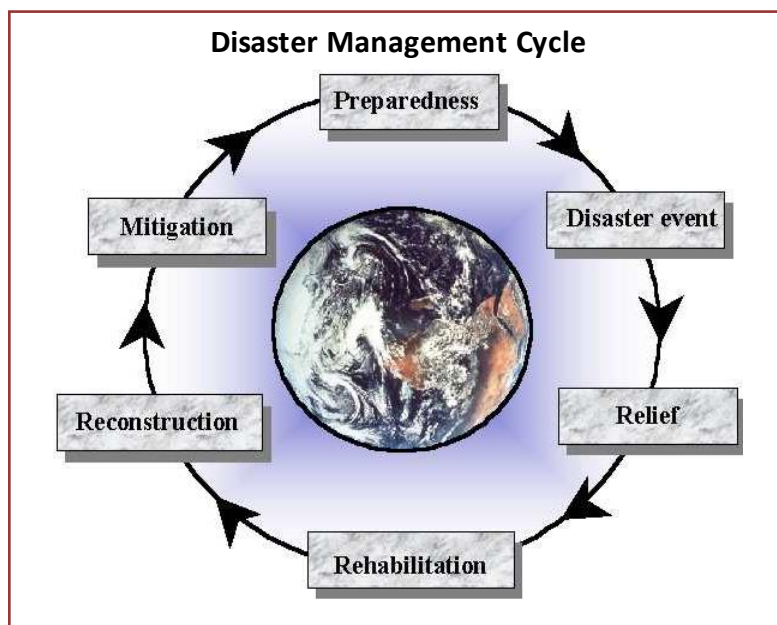
3.2 Strengthening Emergency Operations

Considering the existing gaps in the functioning of EOCs in the State, it has been decided to strengthen the understanding of key functionaries engaged in the emergency operations through the preparation and dissemination of this handbook for emergency management. The State Disaster Management Plan, 2016 in Section 8.7 has identified the ‘Strengthening of State and District Emergency Operations Centres’ as one of the seven priorities of the State in the period 2017-22.

This handbook details the functions of state and district emergency operations centres and includes: 1) Functions of Emergency Operations Centres; 3) Minimum facilities required in Emergency Operations Centres; 4) Training requirements of human resource at EOCs; 5) Maintenance of communication network and 6) Emergency Support Functions Plan (Draft).

4. Functions of Emergency Operations Centres

The EOCs have specific roles in each stage of the disaster management cycle (Figure 1). Section 38, 2 (h) of the DM Act, 2005 states that it is the responsibility of the State Government to “establish adequate warning system up to the level of vulnerable group”. Early



Warning Dissemination is one of the most important roles of EOC. The flow of early warning in the State is as per the diagram in Figure 2. The EOC utilizes Information and Communication Technology (ICT) tools and various other modes available for transmission of early warning to the vulnerable groups and also activate the responders. During

the normal times it maintains a systematic database of the resources available, important phone numbers, names and addresses of important government and non-government officials, international bodies, NGOs. During crisis it is expected to function as a center for decision making and help flow of information horizontally and vertically to the respected departments and districts for smoother relief operations. In the Emergency Operation Centre, all the major activities will be distributed among the officials of the nodal departments responsible for emergency support functions to ensure accountability, proper information, assimilation and record keeping. This will also help in easy coordination and reporting to the State/District Incident Commander.

At every instance, the emergency powers, functions and discretionary powers of the chairpersons of the SDMA [Section 18 (3) of DM Act, 2005], SEC [Section 20 (3) of DM Act, 2005] and DDMA [Section 34 of DM Act, 2005] will prevail over any of the guidelines and procedures laid out herein. The activities of EOCs can be classified as normal time and emergency time activities. However, the chain of command and control shall be preserved through EOCs and it shall be the nerve centre of decision making. Every instruction issued and action taken against each instruction shall be complied by the respective EOCs after the crisis situation pass off and these event reports shall be documented and reviewed by the Authority at the appropriate level; by SEC at the State level and by DDMA at the district level. All emergency operations facilities in the state have normal time functions.

4.1 State Emergency Operations Centre – Normal time functions

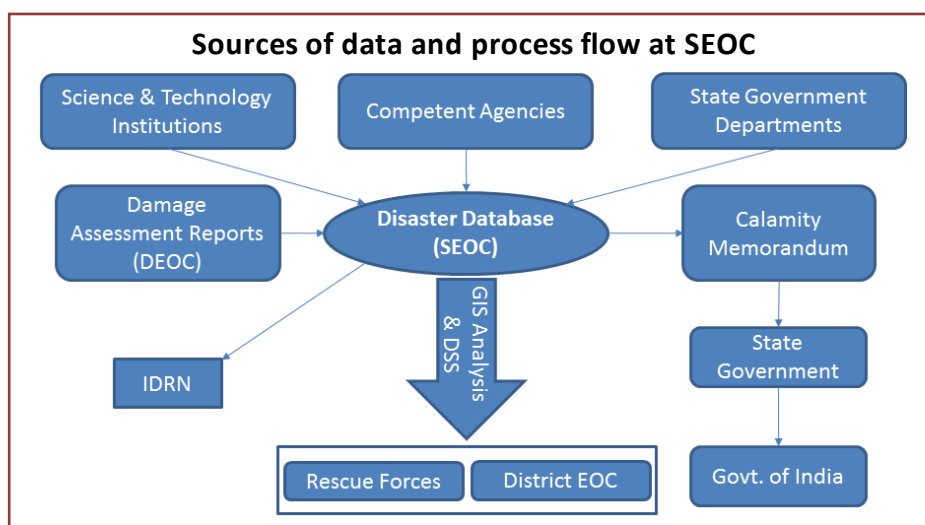
During normal times, the SEOC functions under the Head (Scientist), SEOC in the administrative control of the Principal Secretary, Revenue and Disaster Management.

- Advise the Government in the effective implementation of National Disaster Management Act, 2005
- Prepare and provide technical and scientific advisories to the KSDMA and the Government on matters related to disaster management
- Prepare and update the State Disaster Management Plan based on departmental plans of nodal departments
- Conduct and regularly update the hazard, vulnerability and risk assessment of the state
- Conceptualization, implementation and upkeep of hazard early warning systems
- Concurrent and round the clock assessment of hydro-meteorological data received from nodal departments
- Create and maintain the disaster database of the state
- Undertake research projects on topics relevant to disaster risk reduction
- Ensure proper functioning of multi-channel alternate communication systems
- Foster research collaboration and avail funding for research works from national and international organizations, universities and funding agencies
- Issue warnings to district administrations and if necessary to public based on predefined thresholds of environmental variables (rainfall, water level, seismological inputs, wave height etc.) and specific warnings from Indian Meteorological Department (IMD), Central Water Commission (CWC), Geological Survey of India (GSI), Indian National Centre for Ocean Information Services (INCOIS), National Centre for Earth Science Studies (NCESS), National Emergency Operations Centre (NEOC) etc.
- Develop standard operating procedures with the help of competent organizations
- Ensure timely preparation and updation of departmental plans of nodal departments through the Government
- Advise the government in appropriately allocating financial and hardware resources available for disaster risk reduction

Competent agencies for issuing warnings

- IMD: Weather warnings
- CWC: Flood warnings
- GSI/NCESS: Landslide warnings
- INCOIS/NCESS: High wave & tsunami
- NEOC/SEOC: Any of the above
- District EOC/District Collector: Events without precursors (eg., accidents/earthquakes/terror attacks)
- Government: Any of the above

- Advise the government in disaster management policy formulation and planning
- Advice in undertaking any steps for disaster risk reduction as deemed appropriate given the concurrent status of environmental variables and early warnings, if any, received from appropriate agencies



- Coordinate with various agencies for capacity building of stakeholders in disaster risk reduction and maintain a detailed inventory of trained human resource
- Monitor preparedness measures undertaken at the district levels including simulation exercises undertaken by various departments
- Update the Indian Disaster Resource Network as and when the State/District Disaster Management Plans are revised
- Conduct specific investigations on matters related to disaster risk reduction voluntarily or based on direction from appropriate competent authorities and furnish specific recommendations for disaster risk reduction to the Government for implementation
- Ensure timely meetings of RMC, SEC and SDMA for appropriate administrative decision making related to disaster risk reduction

4.2 District Emergency Operations Centre – Normal time functions

Similar to SEOC, the DEOCs also have normal time functions. The DEOC is entrusted with the following functions:

Normal time functions

During normal times, the DEOC will function under the control of Deputy Collector (DM)/ADM as available in the district.

- Prepare and update District Disaster Management Plans based on departmental plans of nodal departments

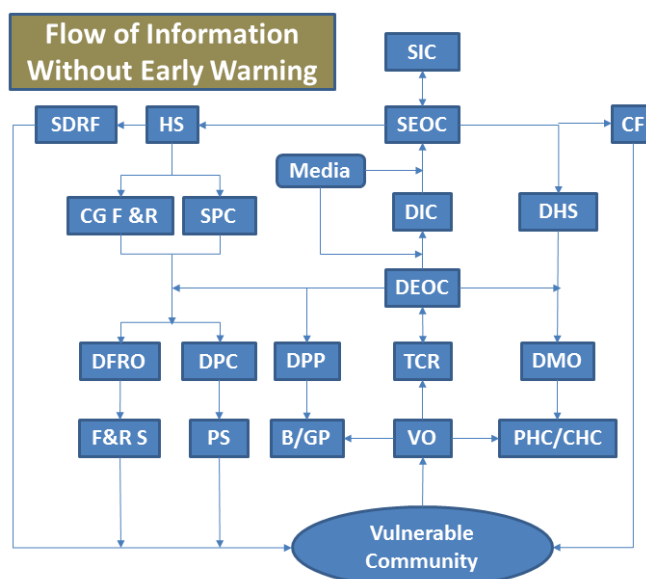
- Monitor the preparation and timely updation of district level departmental plans of nodal departments
- Monitor the preparation and timely updation of block level, panchayath level and urban area level disaster preparedness plans
- Ensure updation of district level resource inventory
- Ensure the continued maintenance of the VHF network of the Dept. of Disaster Management with the help of Police Telecommunications as directed vide Ltr. No. 24121/K1/2014/DMD dated 22/05/2014
- Communication of early warnings issued by competent agencies to the appropriate district level authorities of Police, Fire & Rescue Services, Health, PWD, Irrigation and KSEB and to Tahasildars and Village Officers of the hazard prone villages in the district as specifically issued by SEOC
- Compilation of daily calamity report from the district authorities of nodal departments and village offices
- Communication of specific directions issued by competent agencies to appropriate levels in the district
- Act as the secretariat of the DDMA
- Advise the District Level Incident Commander in appropriately allocating financial resources available to the district for disaster risk reduction

4.3 Emergency time functions

Response process begins as soon as it becomes apparent that a disastrous event is imminent and lasts until the disaster is declared to be over.

1. Response is triggered when an authenticated early warning or information on occurrence of disaster is received at the DEOC or SEOC as the case may be
2. On receipt of alert/early warning or information about onset of disaster, District Collector or State Relief Commissioner assumes the role of District Incident Commander (IC) for L1 or L2 level disaster respectively, as the case may be
3. Immediate access to the disaster site through various means of communications such as mobiles, VSAT, wireless communication and hotline shall be attempted
4. The EOCs will continue to operate in Emergency Time Mode as long as the need for emergency relief and operations continue
5. Flow of information will be regulated as given in figures below for events with and without early warning
6. Early warnings issued by competent agencies will be verified and cross checked against past history of occurrence by SEOC before issuing it to media for public dissemination. SEOC will issue the following warnings to media:

- INCOIS Ocean High Wave Alerts: All high wave alerts of >3 m will be issued to media
- INCOIS Tsunami alerts will be issued as is to media if applicable for Kerala
- ISGN/SEOC Seismic Event reports of >3 M will be provided to media
- IMD Rainfall warnings: All warnings starting from Heavy Rainfall Warning onwards will be issued to media
- IMD Wind warnings: All wind warnings of >40 km/hr will be issued to media



7. The levels of disasters have been categorized as L0, L1, L2 and L3 in the ESFP 2015 for organizing the responsibility of preparedness, enforcement of safety regulations and response, based on the ability of various authorities to deal with them.
 - a. L0 denotes normal times which are expected to be utilized for close monitoring, documentation, prevention, mitigation and preparatory activities. Nodal departments as identified in Section 5.1 of this document will be responsible for monitoring, documentation, prevention, mitigation and preparatory activities including disaster response planning as per the departmental disaster management plans and the ESFP, 2015
 - b. L1 specifies disasters that can be managed at the district level, however, the state and centre will remain in readiness to provide assistance if needed. All events that results in the loss of life of at-least one (1) individual or which injures at-least two (2) individuals or which affects 50% of the area of a ward of a Grama Panchayath/Municipal Corporation/City Corporation will be considered as L1 events and the district nodal officers for disaster management of the respective nodal department shall ensure adequate response through the District Emergency Operations Centers. Services of Central Forces shall not be availed for managing such events unless otherwise deemed absolutely necessary
 - c. L2 specifies disaster situations that may require assistance and active participation of the state, and the mobilization of resources at the state level. All disastrous events that results in the loss of life of at-least five (5) individuals or which injures at-least ten (10) individuals or which affects 50% of the area of a Grama Panchayath/Municipal Corporation/City Corporation will be considered as L2 events and the State Authority will facilitate necessary support for emergency response by availing the services of central forces such as Army, Navy, Airforce, Coast Guard, Indo-Tibetan Boarder Police, Defence Security Corps, Central Industrial Security Force, Central Reserved Police

d. L3 disaster situations arise from large-scale disasters where districts and the state may not have the capacity to respond adequately and require assistance from the central government for reinstating the state and district machinery. Management of L3 disaster response will be regulated by the Crisis Management Plan 2016 (Part 1), Ministry of Home Affairs (MHACMP, 2016)

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- The diagram illustrates the flow of information with early warning. It features a central column of boxes: SIC, SEOC, DIC, DEOC, TCR, and VO. To the left of this column are boxes for SDRF, HS, CG F & R, SPC, DFRO, DPC, DPP, F&R S, and PS. To the right are boxes for CF, DHS, DMO, and PHC/CHC. A 'Media' box is positioned between HS and SEOC. Arrows indicate the flow of information: from HS to SDRF and SEOC; from SEOC to SIC, DIC, and DEOC; from DEOC to TCR and DMO; from TCR to VO; from VO to PHC/CHC; from PHC/CHC to the Vulnerable Community; from DFRO to F&R S; from DPC to PS; from PS to the Vulnerable Community; from DPP to B/GP; from B/GP to the Vulnerable Community; from SDRF to the Vulnerable Community; and from HS to the Vulnerable Community. A red speech bubble points to the SEOC box with the text 'Early warning from competent agency'.

Commander will report to the District Incident Commander directly

12. OIC will make all emergency decisions
13. OIC shall have the delegated powers under Section 34 of the DM Act, 2005 in the respective area of operation
14. The OIC shall report to the DEOC every 30 minutes and take orders from the DIC
15. The DEOC shall, every 1 hour, update the SEOC regarding the status of activities and take order from the SEOC
16. Services of National Disaster Response Force will be requested as per NDRFSOP, 2015
17. The DIC will coordinate and control resources of the District and those provided by the State when L2, or by the Nation when L3, events occur
18. All Central Forces shall report directly to the SEOC every 30 minutes regarding the status of activities
19. It will be the responsibility of the DEOCs to communicate emergency and disaster information via telephone, FAX, SMS or email to SEOC so as to trigger interdepartmental coordination and inform and avail the services of departmental nodal officers. The contact details are: Email (seoc.gok@gmail.com), Fax (0471-2364424), Telephone (0471-2364424), Mobile: 9446579222.
20. Information regarding warnings and emergencies will be disseminated by all possible media through SEOC and DEOC as deemed appropriate
21. Coordination with surrounding States is essential when an event having impacts beyond State boundaries occur. The Chief Executive Office of the SDMA or the Convener of the SDMA will have the powers for official interactions and discussions with neighboring states and decision making in matters relating to disaster management involving neighboring States
22. All nodal departments have to prepare Departmental DM Plans in accordance with the guidelines provided as Annexure 9
23. Departments, agencies and organizations assigned either primary or supporting responsibilities in the ESFP, 2015 must develop departmental plans in order to undertake the emergency supports function assigned to them
24. When local resources prove to be inadequate during emergency operations, request for assistance will be made to the State and the State shall seek the assistance of Departments, Institutions or Organizations under Government of India in accordance with the MHACMP, 2016
25. The State EOC will coordinate with other State's EOCs, National ERC, agencies of the Govt. of India like Indian Meteorological Department, Central Water Commission, Indian

SIC: State Incident Commander; HS: Home Secretary; SDRF: State Disaster Response Force; SPC: State Police Chief; CG F & R: Commandant General Fire & Rescue Services; DIC: District Incident Commander; DHS: Director of Health Services; DPP: District Panchayat President; DMO: District Medical Officer; TCR: Taluk Control Room; VO: Village Officer; B/GPP: Block/Gram Panchayat President; DPC: District Police Chief; DFRO: District Fire & Rescue Officer; PS: Police Station; F & RS: Fire & Rescue Station

National Centre for Ocean Information Services to maintain up-to-date information concerning potential heavy/very heavy rainfall, cloud bursts, cyclones, flooding, tsunami etc. As appropriate, such information will be provided to the citizens of the preparing areas in the State that may be affected by the event

26. Disaster occurrence could result in disruption of government functions and, therefore, all levels of local government and their departments should develop and maintain procedures to ensure continuity of Government functions

4.4 State Disaster Management Control Room

The State DM Control Room functions 24 hrs and is entrusted with the following functions.

- Communication of early warnings issued by competent agencies to the State Police Control Room
- Communication of early warnings issued by competent agencies to the District Control Rooms of Revenue & DM and Police via email, telephone, fax and/or SMS
- Compilation of daily calamity report from districts and communication of the same to NEOC and SEOC via email
- Communication of specific directions issued by SEOC to the District Control Rooms

5. Minimum facilities required in EOCs

The EOCs should have the following basic capabilities.

- *Flexibility* – scale operations and adapt operational space to all hazard events e.g., have sufficient space, equipment, furniture, administrative supplies, telecommunications, computer support, etc., available to satisfy mission requirements.
- *Sustainability* – support operations for extended duration; e.g., be able to sustain operations 24 hours a day/seven days a week during all emergency situations without interruption; to the extent practical, be located in a place that is not a high-risk area for known hazards such as flood zone, other natural hazard, nuclear power plant, hazardous material sites, etc.
- *Security* – guard against potential risks and protect operations from the unauthorized disclosure of sensitive information, e.g., have sufficient security and structural integrity to protect the facility, its occupants, and communications equipment and systems from relevant threats and hazards.
- *Survivability* – sustain the effects of a realized potential risk and continue operations from the EOC or a fully-capable alternate location, e.g., have an alternate EOC that can be activated and used if the primary is destroyed, damaged, or not accessible.
- *Interoperability* – share common principles of operations and exchange routine and time-sensitive information with other EOCs, e.g., be able to communicate with local government EOCs, emergency response teams at or near an incident site, state EOC.

5.1 State Emergency Operations Centre

The State Emergency Operations Centre presently functions in the Institute of Land and Disaster Management, PTP Nagar, Thiruvananthapuram. This office is expected to be moved to a dedicated building with over 2000 m² floor area opposite Kananakunnu Palace, Thiruvananthapuram. When fully operationalized, this Centre will function 24 hours and house a state-of-the-art Decision Support System for disaster risk management.

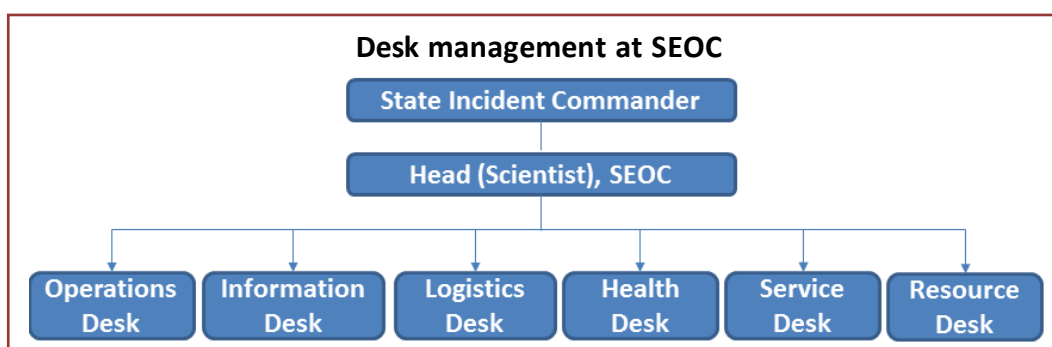
5.2 District Emergency Operations Centre

- **Location:** All DEOCs should be within the District Collectorates and must be in close proximity to the office of the District Collector. Accessibility to pantry and toilets shall be ensured.
- **Size & space:** The DEOC must be a minimum of 100 m² in size and should be capable of handling the maximum anticipated staff that would be called in the event of a major disaster. The DEOC should have space for
 - Conducting the DDMA meeting

- Permanent display wall for maps
- Pigeonhole wall rack for prominently and visibly storing the DDMP and SOPs
- Storage cabinet for safe keeping of important SOP charts, spare copy of maps and other relevant literature related to disaster management
- Space for holding extended meeting of DDMA with two representatives each from the Departments represented in the District Disaster Management Authority
- Should be in close proximity to restrooms
- Work desks for all departments represented in the DDMA
- Provision for night time refreshment

5.3 Desk Management at EOCs during disasters

In the Emergency Operation Centre all the major activities will be distributed among different government officials of different departments responsible for ESFs to ensure accountability, proper information, assimilation and record keeping. This will also help in easy coordination and reporting to the State Disaster Manager. In order to ensure this, the KSDMA, in its meeting held on 27th January 2014 has decided that 'all stakeholder departments of disaster management in the state shall be directed to assign a grade 1 officer as nodal officer on call for the SEOC such that these officers will reach the SEOC as and when the Head (Scientist), SEOC demands'. This structure is to be activated once the SEOC starts functioning 24 hrs and particularly during L2 & L3 disasters.



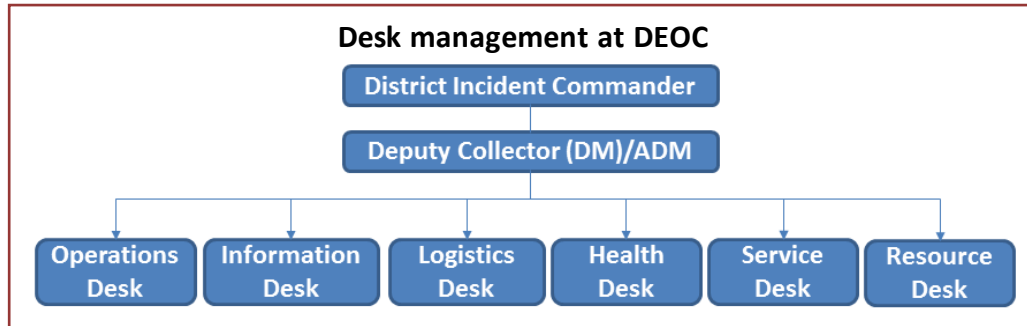
To ensure the same system in DEOC's, vide Letter No.24121/K1/2014/DMD dated 22/05/2014, the Government directed all district administrations to upgrade and operationalize DEOCs with 24 hrs staff of Revenue, Police (with Police VHF radio) and Fire and Rescue. Agriculture, Health and Irrigation was directed to designate one officer to DEOC on an on-call basis.

Operations Desk

SEOC – Dedicated & trained staff; **DEOC** - Police and Fire & Rescue

- Monitoring field level rescue and evacuation operations
- Monitoring salvage operations

- Requisition of accommodation, transport and other necessary equipment for relief groups
- Maintain law and order
- Regular updates to the EOC regarding relief operations



Information Desk

SEOC – Dedicated & trained staff; **DEOC** – Land Revenue

- Communication of weather reports and warnings and subsequent updates
- Dissemination of information
- Keep contingency plans along with all necessary maps in ready to use condition
- Maintenance of important telephone numbers, database on available resources, list of key persons
- Send and receive messages and maintain records of the messages
- Maintain information of damage, materials sent and ongoing activities for immediate sharing with Emergency Operation Centre

Logistics Desk

SEOC – Dedicated & trained staff; **DEOC** – Transport Department

- Assess the need in terms of manpower and resources and ensure regular supply
- Ensure proper storage and transport facilities for relief materials
- Maintain adequate supply of necessary transport and equipment
- Coordinate with private transport associations and boat association for emergency requirement
- Organize transportation for rescue party, evacuated people medical terms and injured or sick people

Health Desk

SEOC – Dedicated & trained staff & the State Level Nodal Officer of Health Department;

DEOC – Health Department

- Organize treatment of injured and sick, providing technical support for the disposal of carcasses

- Prevention and management of communicable diseases and epidemic prevention
- Maintain record of all activities
- Assess and ensure conducting medical camps in the field as required
- Maintain adequate supply of medicines, equipment and personnel
- Providing clinical care services, preventive care and other public health measures in camps
- Post disaster epidemic prevention in the field, mental health care, medical rehabilitation and follow up

Service Desk

SEOC – Dedicated & trained staff; **DEOC** – Land Revenue

- Overall coordination of rescue and relief operations
- Assessing the relief, search and rescue and cash compensation requirements
- Organize and co-ordinate setting up of relief camps
- Ensure adequate supplies to the camps
- Coordinate identified NGO activities to ensure community participation
- Reporting the procurement and disbursement of relief material received from all sources
- Organize construction of temporary shelters, school buildings, medical facilities etc.
- Maintenance of cash and disbursements receipts, issue of relief materials, T.A & D.A of relief duty staff, daily wages, cash and credit vouchers, gratuitous and compensation paid, etc.
- Issuing of all cash and material receipts
- Reimbursement of all expenses approved
- Issue of cash vouchers for petrol and diesel

Resource Desk

This desk shall be handled by the respective department as per the Emergency Support Functions Plan (Annexure I).

5.4 Infrastructure requirements at EOC

Sl. No	Equipment	Number
1	Internet	
	KSWAN	3 nodes
	BSNL internet (Wired)	1 line
	Private internet service provider (WiFi)	1 line
2	Telephone	
	BSNL landline via EPBX system	1 (scalable to handle up to 10 lines)

	Android based waterproof Smart Phone with GPS & integrated camera with SIM card based 3G/4G internet (The SIM cards shall be from two different service providers to ensure multiple connectivity)	2
	Voice Over Internet Protocol (Skype or Google Talk)	Installed in all computers in the EOC
3	Satellite Phone	1
4	Fax	1
5	Wireless	
	Disaster Management VHF	1 master set & 4 handsets
	Police VHF	2 handsets
6	LED Television (42 inch or higher) with integrated WiFi and HDI and internet accessibility	2
7	High Frequency Ham Radio Set	1
8	Radio Receiver	1
9	Video link via internet (Skype or Google Talk)	Installed in at least 2 computers in the EOC
10	UPS (5 KVA) with Gel/Solid State Batteries	2
11	Portable Generator (15 KVA)	1
12	Computer	
	Desktop (i7 or above with 8 GB Ram and 1 TB storage) with 24 inch LED monitor preloaded with office suite & compatible with off the shelf GIS software	3
	Laptop (i5 or above with 4GB Ram and 1 TB storage) with 14 inch LED monitor preloaded with office suite & compatible with off-the-shelf GIS software	3
	Tablet computer with 3G internet connectivity	2
13	Multifunction laser printer (Printer, Scanner & Fax)	1 with 2 spare filled cartridges at any point of time
14	Colour laser printer	1 with 2 spare filled cartridges at any point of time
15	Waterproof & shockproof digital camera with HD video recording facility	1
16	LCD Projector and projection board	1 with 1 spare projector lamp
17	Software	
	Google Earth Pro	At-least 1 license
	MS Office	At-least 1 license
	MS Windows	At-least 1 license
18	Databank	
	Printed multi-hazard zonation map	2 (one laminated and mounted on the wall)
	Printed list of hazard prone villages	2 copies
	Revenue Diary	2 copies
	Transportation network map	2 (one laminated and mounted on the wall)

	Printed copies of Standard Operating Procedures	2 copies
	Printed copies of District Disaster Management Plan	2 copies
	Printed copy of Emergency Support Functions Plan	2 copies
19	Necessary stationary	As per requirement
20	CO2 Fire Extinguisher	1
21	White board (3 ft X 4 ft)	1
22	Soft board (10 ft X 6 ft)	1
23	White board (10 ft X 6 ft) + white board markers	1
24	Emergency Lighting Facilities	
	Torches (water proof)	2
	LED Flashlights	2
	Chemical Light sticks	1 box
	Emergency Lighting – ASKA	2
25	Cabinet for storage	As per requirement
26	Pigeon hall for holding the databank	As per requirement
27	Refreshment & miscellaneous facilities	
	Microwave Oven	1
	Induction stove	1
	Utensils for preparing one time meal and hot beverages	1 set
	Storage facility for keeping food provisions for 2 days	As per requirement
	Food provisions for 2 days survival	As per requirement
	Split air-conditioners (1 tone each)	2
	Electric fan	As per requirement
	Lightning (LED lights being the most energy efficient, they have to be used instead of CFL or incandescent)	As per requirement
	Collapsible bed & sleeping bags	2
28	First aid kit (to be replaced after prescribed shelf life)	5 sets
29	Handheld oxygen inhaler (to be replaced after prescribed shelf life)	3

(Updated with inputs from (HPSDMA, 2011)

6. Warning Systems and Standard Operating Procedures

6.1 Rainfall

Source of information – IMD: <http://imdtvm.gov.in/>



Extremely heavy rainfall (ERW)
(>244.4 mm)

Most vigil - Actions to be taken and sustained till warning is withdrawn, in the districts predicted to be affected by the rainfall


- SEOC & DEOC – Emergency time functions activated
- State-District-Taluk Control Rooms of Revenue and Police – 24 hours functioning
- NDRF, SDRF and Fire & Rescue Service – pre-positioned as per the direction of the State Incident Commander
- Army, Navy, Air Force and other central forces in the state – Readied to move in to any location in the state
- BSNL and Police – Deploy emergency communication systems
- Hospitals, CHCs and PHCs in the districts predicted to be affected – function at full strength 24 hrs as per requirements by making necessary human resource arrangements from district level. Medical teams should be kept ready for field level disaster management. Ensure control measures for epidemic prevention
- Tahasildar – start the relief camps; Quarry blasting to be banned until at least 24 hrs of rain free situation arises in the quarry locality based on evaluation by the village officers
- Local Self Governments - relocate vulnerable population to the relief camps and other safe locations
- Transport department – take control of all cranes and earthmovers in the district for deployment in the event of major calamities
- KSEB & PWD – Emergency repair teams to be ready for deployment
- District Officers of KSEB, PWD, Health, Irrigation & Transport – to be available at the respective district collectorates
- Police – Stop vehicular traffic other than that of emergency services via Ghat roads prone to landslides & flash floods; ensure strict oneway system for vehicle movement
- Declare holiday for all educational institutions
- All mass gatherings and social events in the district to be stopped
- Public advised to remain indoors and those in landslide/flood prone areas to move to safer locations; Voluntary evacuation warning to public living in the landslide prone hilly villages of the district(s) (based on the list of hazard prone villages published in www.sdma.kerala.gov.in; disasterlesskerala.org)
- Tourism & Forest Departments – Advise tourists not to stop

		<p>in the sides of streams and rivulets that intersect Ghat (Hilly) roads and take bath in streams and bathing ghats when it is raining as these are possible tracts of landslides; close all hill stations and resorts in coastal and low lying areas and evacuate public to safer areas</p>
	<p>Very heavy rainfall (VRW) (124.5 to 244.4 mm)</p>	<p>Be prepared - Actions to be taken and sustained till warning is withdrawn, in the districts predicted to be affected by the rainfall</p> <ul style="list-style-type: none"> • DEOC – Emergency time functions activated • DEOC, District-Taluk Control Rooms of Revenue and Police – 24 hours functioning • SDRF and Fire & Rescue Service – pre-positioned as per the direction of the State Incident Commander • Army, Navy, Air Force and other central forces in the state – Informed • Hospitals, CHCs and PHCs in the districts predicted to be affected – in addition to regular functioning, ensure that doctors, paramedical staff and field staff are available on call for institutional activities and field level disaster management • Tahasildar – take control of the identified relief shelters; Quarry blasting to be banned until 24 hrs of rain free situation arises in the quarry locality based on evaluation by the village officers • Local Self Governments – advice public to restrain from standing near and crossing streams and avoid traffic through Ghat roads • Transport department – ensure that cranes and earthmovers in the district are ready for deployment in the event of major calamities • KSEB & PWD – Emergency repair teams to be ready for deployment • Police – Regulate vehicular traffic other than that of emergency services via Ghat roads prone to landslides & flash floods • District Officers of KSEB, PWD, Health, Irrigation & Transport – to be available on call to District Incident Commander • Tourism & Forest Departments – Advise tourists not to stop in the sides of streams and rivulets that intersect Ghat (Hilly) roads and take bath in streams and bathing ghats when it is raining as these are possible tracts of landslides • Voluntary evacuation warning to public living in the landslide prone hilly villages of the district(s) and hill-stations (based on the list of hazard prone villages published in www.sdma.kerala.gov.in; disasterlesskerala.org)

	<p>Heavy rainfall (HRW) (64.4 to 124.4 mm)</p>	<p>Be updated - Actions to be taken and sustained till warning is withdrawn, in the districts predicted to be affected by the rainfall</p> <ul style="list-style-type: none"> • SEOC – All state level officers of the nodal departments informed • DEOC – Emergency time functions activated • District Control Rooms of Revenue and Police – 24 hours functioning • Tahasildar – ensure that shelters are available if needed; Quarry blasting to be banned until at least 24 hrs of rain free situation arises in the quarry locality based on evaluation by the village officers • Transport department – ensure that cranes and earthmovers in the district are ready for deployment in the event of major calamities • KSEB & PWD – Ensure that emergency repair teams are formed and available to be deployed • Tourism & Forest Departments – Advise tourists not to stop in the sides of streams and rivulets that intersect Ghat (Hilly) roads and take bath in streams and bathing ghats when it is raining as these are possible tracts of landslides
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6.2 Cyclone

Source of information – IMD: <http://www.rsmcnewdelhi.imd.gov.in/>

	<p>Super Cyclone (Wind speed >221 km/hr) or Very Severe Cyclonic Storm (Wind speed 119-221 km/hr) or Severe Cyclonic Storm (89 to 118 km/hr)</p>	<p>Most vigil – Actions to be taken and sustained till warning is withdrawn in the villages/taluks/districts predicted to be affected by the cyclone</p> <ul style="list-style-type: none"> • SEOC & DEOC – Emergency time functions activated • State-District-Taluk Control Rooms of Revenue and Police – 24 hours functioning • NDRF, SDRF and Coastal Police – deployed to the villages • Army, Navy, Air Force, Coast Guard and other central forces in the state – deployed to the villages • BSNL and Police – deploy emergency communication systems • Hospitals, CHCs and PHCs in the districts predicted to be affected by the cyclone – function at full strength 24 hrs as per requirements by making necessary human resource arrangements from district level. Medical teams should be kept ready for field level disaster management. Ensure control measures for epidemic prevention • Tahasildar – relocate vulnerable population to the relief camps and other safe locations, particularly those living in kutchha houses and start the relief camps; Quarry blasting to be banned until the warning is lifted • Local Self Governments – relocate vulnerable population to the relief camps and other safe locations, particularly those living in kutchha houses • Transport department – take control of all cranes and earthmovers in the district for deployment in the event of major calamities • KSEB & PWD – Emergency repair teams to be ready for deployment • District Officers of KSEB, PWD, Health, Irrigation & Transport – to be available at the respective district collectorates • Police – Stop vehicular traffic other than that of emergency services to the area predicted to be affected; ensure strict one-way system for vehicle movement • Declare holiday for all educational institutions • All mass gatherings and social events to be stopped • Public advised to remain indoors and those in cyclone path/landslide/flood prone areas to move to safer locations • Tourism & Forest Departments – Advise tourists not to stop in the sides of streams and rivulets that intersect Ghat (Hilly) roads and take bath in streams and bathing ghats when it is raining as these are possible tracts of landslides & flashfloods; close all hill stations and resorts in coastal and low lying areas and evacuate public to safer areas
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		<ul style="list-style-type: none"> • Railway and Airport Authorities – stop all operations to cone of influence of the cyclone
	<p>Cyclonic storm (Wind speed 32 to 88 km/hr)</p>	<p>Be prepared - Actions to be taken and sustained till warning is withdrawn, in the villages/taluk/districts predicted to be affected by the cyclone</p> <ul style="list-style-type: none"> • SEOC & DEOC – Emergency time functions activated • State-District-Taluk Control Rooms of Revenue and Police – 24 hours functioning • SDRF and Coastal Police – deployed to the villages • Army, Navy, Air Force, Coast Guard and other central forces in the state – high alert; stand by • BSNL and Police – deploy emergency communication systems • Hospitals, CHCs and PHCs in the districts predicted to be affected – in addition to regular functioning, ensure that doctors, paramedical staff and field staff are available on call for institutional activities and field level disaster management • Tahasildar – relocate vulnerable population to the relief camps and other safe locations and start the relief camps; Quarry blasting to be banned until the warning is lifted • Local Self Governments - relocate vulnerable population to the relief camps and other safe locations, particularly those living in kutchha houses • Transport department – ensure that cranes and earthmovers in the district are ready for deployment in the event of major calamities • KSEB & PWD – Emergency repair teams to be ready for deployment • District Officers of KSEB, PWD, Health, Irrigation & Transport – to be available at the respective district collectorates • Police – Regulate vehicular traffic other than that of emergency services to the area predicted to be affected • Declare holiday for all educational institutions • All mass gatherings and social events to be stopped • Public advised to remain indoors and those in cyclone path/landslide/flood prone areas to move to safer locations • Tourism & Forest Departments – Advise tourists not to stop in the sides of streams and rivulets that intersect Ghat (Hilly) roads and take bath in streams and bathing ghats when it is raining as these are possible tracts of landslides and flash floods

6.3 Tsunami

Source of Information – INCOIS: <http://www.incois.gov.in/Incois/tsunami/eqevents.jsp>


	Warning	<p>Most vigil - Actions to be taken and sustained till warning is withdrawn in the villages/taluks/districts predicted to be affected by the tsunami</p> <ul style="list-style-type: none"> • SEOC – Telephonically verify the certainty of the warning from INCOIS • SEOC & DEOC – Emergency time functions activated • State-District-Taluk Control Rooms of Revenue and Police – 24 hours functioning • NDRF, SDRF and Coastal Police – deployed to the coastline • Army, Navy, Air Force and other central forces in the state – deployed to the coastline • BSNL and Police – deploy emergency communication systems • Hospitals, CHCs and PHCs in the districts predicted to be affected by the cyclone – function at full strength 24 hrs as per requirements by making necessary human resource arrangements from district level. Medical teams should be kept ready for field level disaster management. Ensure control measures for epidemic prevention • Tahasildar – evacuate public within 250 m from the coastline to the relief camps and other safe higher ground and start the relief camps • Local Self Governments – evacuate public within 250 m from the coastline to the relief camps and other safe higher ground • Department of Ports and Harbour Engineering – Move all seafaring vessels to deep ocean • KSEB & PWD – Emergency repair teams to be ready for deployment • District Officers of KSEB, PWD, Health, Irrigation, Transport, Ports and Harbour Engineering – to be available at the respective district collectorates • Police – Stop vehicular traffic other than that of emergency services to the area predicted to be affected; ensure strict oneway system for vehicle movement • Declare holiday for all educational institutions in the taluks predicted to be affected by the event • All mass gatherings and social events in the taluks predicted to be affected by the event to be stopped • Public within 250 m from the coastline to move to higher ground and further inland • Tourism Department – Close all resorts within 250 m of the coastline and low lying areas in river-mouths/coastal estuaries and evacuate public to safer areas
	Alert	<p>Be prepared - Actions to be taken and sustained till warning is withdrawn, in the villages/taluks/districts predicted to be affected</p>

		<p>by the tsunami</p> <ul style="list-style-type: none"> • SEOC – Telephonically verify the certainty of the warning from INCOIS • SEOC & DEOC – Emergency time functions activated • State-District-Taluk Control Rooms of Revenue and Police – 24 hours functioning • SDRF & Coastal Police – deployed to the coastline • Army, Navy, Air Force and other central forces in the state – on high alert and standby • BSNL and Police – ready to deploy emergency communication systems along the coastline • Hospitals and PHCs on higher ground outside 250 m from coastline in the districts predicted to be affected – function at full strength 24 hrs as per requirements by making necessary human resource arrangements from district level. Medical teams should be kept ready for field level disaster management. Ensure control measures for epidemic prevention • Tahasildar – be prepared to start relief camps and evacuate public to higher ground outside 250 m from coastline • Local Self Governments – Advice public within 250 m from the coastline to prepare for moving to higher ground • Department of Ports and Harbour Engineering – Move all seafaring vessels to deep ocean • KSEB & PWD – Emergency repair teams to be ready for deployment • District Officers of KSEB, PWD, Health, Irrigation, Transport, Ports and Harbour Engineering – to be available at the respective district collectorates • Police – Regulate vehicular traffic other than that of emergency services to the area predicted to be affected • Declare holiday for all educational institutions in the taluks predicted to be affected by the event • All mass gatherings and social events in the taluks predicted to be affected by the event to be stopped • Public within 250 m from the coastline to be ready to move to higher ground • Tourism Department – Alert all resorts within 250 m of the coastline and low lying areas in river-mouths/coastal estuaries that they may have to close if the warning is increased to alert status
	<p>Watch</p>	<p>Be updated - Actions to be taken and sustained till warning is withdrawn, in the villages/taluks/districts predicted to be affected by the tsunami</p> <ul style="list-style-type: none"> • SEOC & DEOC – Keep checking the tsunami bulletins from the INCOIS website • State-District-Taluk Control Rooms of Revenue and Police –


		24 hours functioning <ul style="list-style-type: none"> • All concerned district administrations and nodal departments listed above to be on alert mode
	Threat Passed	SEOC – cross check with INCOIS that the threat has passed DEOC – cross check with SEOC that the threat has passed

6.4 High Waves (Swell Waves, Storm Surges, Kallakadal)


Source of Information – INCOIS: <http://www.incois.gov.in/Incois/tsunami/eqevents.jsp>

	Alert	<p>Be prepared (> 3m) - Actions to be taken and sustained till warning is withdrawn, in the villages/taluks/districts predicted to be affected</p> <ul style="list-style-type: none"> • SEOC & DEOC – Be on alert • State-District-Taluk Control Rooms of Revenue and Police – Be on alert • Coastal Police, Marine Enforcement – Be ready to immediately respond • Army, Navy, Air Force and other central forces in the state – on high alert and standby • BSNL and Police – ready to deploy emergency communication systems along the coastline • Hospitals and PHCs on higher ground outside 250 m from coastline in the districts predicted to be affected –Medical teams should be kept ready for field level disaster management • Tahasildar – be prepared to start relief camps and evacuate public to higher ground outside 250 m from coastline • Local Self Governments – Advice public within 250 m from the coastline to prepare for moving to higher ground • Department of Ports and Harbour Engineering and Fisheries – Move all seafaring vessels to deep ocean • KSEB & PWD – Emergency repair teams to be ready for deployment • District Officers of KSEB, PWD, Health, Irrigation, Transport, Ports and Harbour Engineering – to be available at the respective district headquarters • Police – Regulate vehicular traffic other than that of emergency services to the area predicted to be affected if needed • Public within 250 m from the coastline to be ready to move to higher ground • Tourism Department – Alert all resorts within 250 m of the coastline and low lying areas in river-mouths/coastal estuaries that they may have to close if the warning is increased to alert status
	Watch	<p>Be updated (1 to 3 m) - Actions to be taken and sustained till warning is withdrawn, in the villages/taluks/districts predicted to be affected</p> <ul style="list-style-type: none"> • SEOC & DEOC – Keep checking the bulletins from INCOIS • State-District-Taluk Control Rooms of Revenue and Police – 24 hours functioning • All concerned district administrations and nodal departments listed above to be on alert mode

6.5 Landslide


Source of information – SEOC: www.disasterlesskerala.org		
Criteria: <ol style="list-style-type: none"> 1. When IMD issued Very Heavy Rainfall Warning 2. When two days of cumulative rainfall exceeds 8 cm in a rain station, landslide warning is issued to the respective districts 		
	Landslide alert	<p>Be prepared - Actions to be taken and sustained till warning time limit expires/until 2 days cumulative rainfall is below 8 cm</p> <ul style="list-style-type: none"> • SEOC & DEOC – Emergency time functions activated • State-District-Taluk Control Rooms of Revenue and Police – 24 hours functioning • NDRF & SDRF – alerted and stand by • Army, Navy, Air Force, Coast Guard and other central forces in the state – alerted and stand by • BSNL and Police – ready to deploy emergency communication systems • Hospitals, CHCs and PHCs in the landslide prone villages of the district – function at full strength 24 hrs as per requirements by making necessary human resource arrangements from district level. Medical teams should be kept ready for field level disaster management. Ensure control measures for epidemic prevention • Tahasildar – take control of the identified relief shelters; Quarry blasting to be banned until 24 hrs of rain free situation arises in the quarry locality based on evaluation by the village officers • Local Self Governments – alert public living close to small rivulets and in hilly segments with $>20^\circ$ slope • Transport department – ensure that cranes and earthmovers in the district are ready for deployment in the event of major calamities • KSEB & PWD – Emergency repair teams to be ready for deployment • District Officers of KSEB, PWD, Health, Irrigation & Transport – to be available on call to District Incident Commander • Police – Regulate vehicular traffic along the ghat roads • Declare holiday for all educational institutions • All mass gatherings and social events to be stopped • Public advised to remain indoors and those in landslide prone areas to move to safer locations • Tourism & Forest Departments – Advise tourists not to stop in the sides of streams and rivulets that intersect Ghat (Hilly) roads and take bath in streams and bathing ghats when it is raining as these are possible tracts of landslides and flashfloods

6.6 Petro-chemical transportation accident

Source of information – Crisis Management Committee on Anthropogenic Hazards, Kerala		
<ul style="list-style-type: none"> The CMG on Anthropogenic Hazards, Kerala constituted vide GO (Rt) No. 6410/2013/DMD dated 29/11/2013 in its meeting held on 6th May 2014 decided to circulate the following Standard Operating Procedures to all Revenue, Police and Fire & Rescue Service offices. The actions listed below shall be activated even if leakage is suspected and shall be kept active until a 'no leakage' certificate is made available by the concerned experts of the industry. Emergency Response Vehicles of Oil Companies are under the control of State Emergency Operations Centre vide GO (Rt) No. 3519/2016/DMD dated 30th August 2016 		
	LPG tanker on fire	Most vigil <ul style="list-style-type: none"> Revenue: Evacuate 500 m; ensure compliance of all the following procedures by concerned departments; inform SEOC for availing the services of the Emergency Response Vehicle of Indian Oil Corporation Fire & Rescue Services: Avoid 'Boiling Liquid Expanding Vapour Explosion (BLEVE)' by continuous colling with water and foam till the fuel is removed by the Emergency Response Vehicle or until the containment gets exhausted Police: No public shall be permitted within 500 m radius; stop all transport from and leading to the site within this radius; no vehicle shall enter the 100 m radius of the site other than Fire Force vehicles and the Emergency Response Vehicle of the petroleum companies; no one other than Fire & Rescue Service Personal and the experts of oil companies shall be permitted within the 50 m radius of the event site KSEB: Disconnect electricity to the panchayaths falling within the 500 m radius BSNL & private mobile telephone companies: Switch off mobile towers within 500 m radius of the event Public within this radius shall be advised not to use mobile phones or other items that may cause a spark (advised through word by mouth announcement – don't use megaphones)
	Petrol/diesel/kerosene/ATF tanker on fire	Most vigil <ul style="list-style-type: none"> Revenue: Evacuate 500 m; ensure compliance of all the following procedures by concerned departments; inform SEOC for availing the services of the Emergency Response Vehicle of Indian Oil Corporation Fire Service: If fuel is leaking, water and foam mix shall be sprayed on to the leaking fuel Police: No public shall be permitted within 500 m radius; stop all transport from and leading to the site within 500 m radius; no vehicle shall enter the 50 m radius of the site other than Fire Service vehicles and the Emergency Response Vehicle of the petroleum companies; no one other than Fire Service Personal and the experts of oil companies shall be permitted within the 50 m radius of the event site
	Industrial	Most vigil

	<p>Accidents including petro-chemical transportation accidents</p>	<ul style="list-style-type: none"> • Revenue: Evacuate 500 m; ensure compliance of all the following procedures by concerned departments; inform SEOC for availing the services of the National Disaster Response Force • Fire Service: If fuel is leaking, water and foam mix shall be sprayed on to the leaking fuel • Police: No public shall be permitted within 500 m radius; stop all transport from and leading to the site within 500 m radius; no vehicle shall enter the 50 m radius of the site other than Fire Service vehicles and the Emergency Response Vehicle of the concerned companies; no one other than Fire Service Personnel and the experts of industries shall be permitted within the 50 m radius of the event site • Oil Companies: Honour the directions issued by SEOC immediately for operational deployment of ERVs and they shall specifically designate officers not below the rank of General Managers to liaison with SEOC for operational deployment of the ERVs. The Oil PSUs shall ensure that ERVs have permanent mobile numbers issued and the numbers shall be intimated formally to SEOC such that SEOC can track the movement of the ERV during emergency deployment and ensure smooth movement through traffic control and Police escort.
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6.7 Space Debris (Meteorites, Debris of space crafts)

No early warning		
The only agency legalised to collect space debris is Geological Survey of India		
	Citing/impact of Space Debris	<ul style="list-style-type: none">• SEOC – Inform Geological Survey of India, Thiruvananthapuram• State-DEOC-District-Taluk Control Rooms of Revenue and Police – Inform SEOC• Police and Revenue – cordon off the impact site (if found). Don't permit any one to touch to debris as some space debris may have radioactive contaminants• Public advised not to touch the debris as some space debris may have radioactive contaminants• Geological Survey of India: Collect the remnants within 24 hrs and provide a report eventually regarding the type of material to SEOC (seoc.gok@gmail.com) and the Government (revenuedmdk@gmail.com) for documentation

7. Maintenance of the emergency communication network

The DM Act, 2005 reiterates that maintaining emergency communication network is the responsibility of the State and District DM Authorities. Accordingly, routine maintenance is needed in the district and state level for ensuring the proper functioning of the emergency communication network. This has to be strictly followed by all DDMAAs.

7.1 VHF network

With the financial assistance of the UNDP and the Tsunami Rehabilitation Programme, the Dept. of Revenue and Disaster Management established a VHF radio network in the state. Owing to various reasons including lack of trained technical human resources in the Land Revenue Department for continued maintenance and operations, some of this equipment is presently under repair and steps have been initiated to operationalize them. Lack of proper training to the Revenue officers managing the VHF network is also a major concern.

Sl. No	Office	Number
1	State Level	4
2	District headquarters (one each)	14
3	Taluk headquarters (one each)	63
4	Vulnerable villages (VHF and public address system)	295

7.1.1 Maintenance cycle for the VHF network

The Government vide GO (Rt) No. 2497/2014/DMD dated 6/6/2014 has appointed a State Nodal Officer for maintaining the VHF network of the Disaster Management Department. The State Nodal Officer is responsible for the upkeep of this network, on behalf of the SEC and to advise the Government in appropriately maintaining this communication system.

Vide Ltr. No. 24121/K1/2014/DMD dated 22/05/2014, the DDMAAs have been directed by the Government to ensure the functioning of this VH network within the respective department through the Police Telecommunications wing.

- On an everyday basis, starting 8 am to 10 am, the DEOC shall contact the Taluk Control Rooms and the respective Taluks to the Villages so as to ensure that the network is functional and a report of the same shall be made available to the State Nodal Officer from the DEOC via the VHF network.
- At the district, taluk and village level, the respective responsible officers (Deputy Collector (DM)/ADM at the district level, Tahasildar at the taluk level and Village Officer at the village

level) shall check the functioning status of the VHF system in their respective office on a daily basis.

- If any instrument is not functioning, the matter may be brought to the notice of the Police Telecommunications wing of the respective district.
- Payments for the repair shall be met from the funds allotted to the respective DDMA for strengthening emergency response capability/strengthening DEOCs.
- At the state level and at DEOCs, if the instruments are not functioning, the matter shall be informed to State Nodal Officer.
- The State Nodal Officer shall ensure that the connectivity between the state offices and the district EOCs are functional at all times for which the services of the Police Telecommunications wing may be sought.

7.2 Internet connectivity

Three modes of internet/wide area network needs to be setup at DEOC, they being the Kerala Wide Area Network, internet connectivity through BSNL backbone (Wired) and connectivity through a private service provider (WiFi). This may substantially reduce the chance of losing connectivity in the event of major calamities. The responsible officer of the EOC should ensure that at no times connectivity is interrupted due to non-payment of bills. Special arrangements may be made with the service providers for the same, exercising the powers of the SDMA/DDMA vide DM Act, 2005.

7.3 Telephone and Fax

Every DEOC and Taluk Control Rooms should have traditional landline based telephone and fax. The landline should be scalable to handle up-to 10 lines at a time and the fax line should be separate such that fax and voice calls can be simultaneously handled. The responsible officer of the DEOC and the Taluk Control Rooms shall ensure that the lines are fully functional at all times. Special arrangements, if necessary should be made by the DDMA with the concerned BSNL officer for the area to ensure that the lines are not affected even during major disasters. The responsible officer of the EOC should ensure that at no

Japan Tsunami 2011 and SMS

As an aftermath of Japan Tsunami 2011, the communication network was badly damaged. Audio and video communication channels failed, but it was noticed that text format Short Messaging Service (SMS) remained functional which when augmented by mobile micro-wave proved to be an important mode of communication for civilians and rescue workers.

(BBC, 2012)

times connectivity is interrupted due to non-payment of bills. Special arrangements may be made with the service providers for the same, exercising the powers of the SDMA/DDMA vide DM Act, 2005.

7.4 GSM connectivity

The DEOC should have a Global System for Mobile Communications (GSM) connectivity to ensure that at least one channel of communication is open between the District, the State and the National level. Normal wired land phones and fax systems are susceptible to immediate damage in the event of major calamities as the telephone poles and switching centres may be affected. GSM connectivity is easy to be reinstated with remote Emergency Communication Vehicles and mobile towers that may be deployed by the operators. GSM connectivity will also ensure that the DEOC can establish contacts through Short Messaging Service (SMS) which has proven to be a reliable mode of communication after Japan Tsunami 2011. The responsible officer of the EOC should ensure that at no times connectivity is interrupted due to non-payment of bills. Special arrangements may be made with the service providers for the same, exercising the powers of the SDMA/DDMA vide DM Act, 2005.

7.5 Police VHF

Vide Ltr. No. 24121/K1/2014/DMD dated 22/05/2014, the DDMAAs have been directed by the Government to ensure that all DEOCs have 24 hour staff of Police, Fire & Rescue and Revenue Departments. Accordingly, the police personnel posted to the DEOC should be equipped with two handsets of the police VHF network. This will ensure that emergency information through police network is also passed to the DEOC without delay.

7.6 National Disaster Management Services

NDMS is a project implemented by NDMA. It is a grant-in-aid in kind project that intends to pilot the establishment of satellite based communication network in all states. In Kerala, the project is implemented in creating satellite based communication linkages between SEOC and DEOCs of Idukki, Ernakulam and Wayanad. The instrumentation includes VSAT Connectivity, Satellite Phones, HF Radio sets and support of one technician in each location. The satellite based network is expected to provide additional redundancy in communication. The project is implemented by SEOC vide GO (Rt) No. 2203/2016/DMD dated 30-03-2016. An MoU has been entered between the NDMA and Government of Kerala on 5th May 2016 for the implementation of the project and it has a duration of 24 months.

8. Training requirements of the human resource at EOCs

Emergency Operations Centres are unlike Police Control Rooms wherein trained human resource with a single hierarchical command and control is present. Being a facility where civil and uniformed staff work in tandem, staff of the EOC needs to be specially trained in emergency operations management. The following syllabus is identified for training the Human Resource deployed to EOCs.

Sl. No	Topic	Detailed Syllabus	Time
1	Disasters - General Introduction	Introduction to Disasters – L0, L1, L2, L3 – What is a disaster and what is not a disaster? Types of Disasters, Basic concepts and terminologies, Hazard, Vulnerability, Risk, disasters in Kerala, National DM Act 2005, administrative setup of disaster management in the central and state	2 hrs
2	Disaster Communication	Types of communication – VHF, SMS, Email, Telephone, FAX, Satellite Phone – clarity in messaging, message recording, message transfer to nodal departments; early warnings and competent agencies for issuing warnings; sources of warning	2 hrs
3	Emergency Operations from EOC	Organizational setup of EOCs, functions of EOCs, desk operations and facilities required, rapid assessment of emergency, formats for damage reporting, rapid damage assessment, norms of SDRF/NDRF, daily reporting via email, preparation and archival of daily reports, using maps for effective disaster management, using state and district hazard maps, use of Google Earth in the event of crisis, Standard Operating Procedures, assessing hazard probability with limited data, scaling emergency levels – L1 to L3, judging the deployment of resources	4 hrs
4	Central Forces and Emergencies	Assessing the need for requisition of NDRF, Army, Navy, Air Force and other central paramilitary forces; hierarchy and command structures of central forces; interfacing district incident commander and the central forces; requisition and derequisition of central forces	2 hrs

The Institute of Land and Disaster Management is the nodal centre in the state for imparting training in disaster risk management. A structured 3 days training programme with certification will be offered at ILDM on the topics given above to Emergency Operations Centre and Control Room staff.

9. References

- BBC, 2012, Tsunami steers Japan tech innovation.
http://news.bbc.co.uk/2/hi/programmes/click_online/9704041.stm.
- HPSDMA, 2011, Emergency Operations Centre Manual, Himachal Pradesh State Disaster Management Authority, Govt. of Himachal Pradesh, India.
- NDMA, 2007, National Disaster Management Guidelines - Preparation of State Disaster Management Plans, National Disaster Management Authority, Govt. of India, 19 p.:

10. Annexures

10.1 Annexure I: Emergency Support Functions Plan, 2015 (Approved on 29th January 2015 by the State Executive Committee of KSDMA)

In the aftermath of a major natural disaster wherein State Government's assistance is required for the districts, the command, control and coordination will be carried out under the ESFs Plan.

EOC shall activate the ESFs and the concerned Department/Agency of each ESFs shall identify requirements in consultation with their counterparts in affected districts, mobilize and deploy resources to the affected areas to assist the district (s) in its/their response action. The State EOC shall maintain a close link with the District EOCs and NEOC.

ESFs shall be responsible for the following:

1. They will coordinate directly with their functional counterpart in districts to provide the state government, the assistance required. Request for assistance will be channelled from the district both through the District Incident Commander/DEOC and designated departments/agencies. Based on the identified requirements by the districts, appropriate assistance shall be provided by an ESF Department/Agency to the district or at the District Incident Commander's request, directly to an affected area.
2. The designated authorities for each of ESF shall constitute quick response teams and assign the specific task to each of the member.
3. The designated authorities for each of the ESF shall identify and earmark the resources i.e. Manpower and materials to be mobilized during the crisis.
4. An inventory of all the resources with the details shall be maintained by each of the designated authority for each of the ESF.
5. The designated authority for each of the ESF will also enter into pre-contracts for the supply of resources, both goods and services to meet the emergency requirements
6. The designated authority for each of the ESF will be delegated with adequate administrative, legal and financial powers for undertaking the tasks assigned to them.

Primary and Secondary Agencies: The designated primary agency shall be assisted by one or more support agencies (secondary agencies) and shall be responsible for managing the activities of the ESF and assisting the district in the rescue and relief activities and ensuring that

the mission is accomplished. The primary and secondary agencies have the authority to execute response operations to directly support the needs of the affected districts.

Roles and responsibilities of primary and secondary Emergency Support Agencies

ESF No	ESF	Primary agency	Secondary agency	Responsibilities of Primary agency	Activities for Response	Role of Secondary agency
1	Command and Control	<ul style="list-style-type: none"> • SEOC • DEOC 	<ul style="list-style-type: none"> • Dept. Information Technology • National Informatics Centre • BSNL 	of <ul style="list-style-type: none"> • Act as the headquarters of Emergency Operations • Issue directions on-behalf of the Incident Commander • Issue status update of weather and other relevant environmental parameters • Collect and report status of victims and assist family reunification • Apply GIS to speed up search and rescue • Enable local authorities to establish contact with the State authorities • Coordinate planning procedures between District, State and the Centre and between departments • Provide ready formats for all reporting procedures 	<ul style="list-style-type: none"> • Map the primary damage area and avail this information to field level functionaries • Documentation of response/relief and recovery measures • Situation reports to be prepared and forwarded to SEOC and NEOC every 3 to 5 hrs 	Ensure perennial and uninterrupted communication facilities for the SEOC/DEOC

				<ul style="list-style-type: none"> • To facilitate the optimization of donations received in kind • Coordinate, collect, process, report and display essential elements of information and to facilitate support for planning efforts in response operations • Coordinate pre-planned and event-specific aerial reconnaissance operations to assess the overall disaster situation • Pre-positioning assessment teams headed by the State coordinating officer and deployment of other advance elements 		
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2	Communication	BSNL	<ul style="list-style-type: none"> • Police • Central and State Armed Forces • HAM Radio Operators • SEOC/DEOCs 	<ul style="list-style-type: none"> • Coordination of actions to assure the provision of telecommunication support in the State, District and the affected area • Assess and ensure temporary telecommunication in the affected area 	<ul style="list-style-type: none"> • Deploy temporary telecommunication networks 	<ul style="list-style-type: none"> • Make available Police and Disaster Management wireless network at the affected locations • Facilitate the movement of licensed HAM Radio Operators and community radio operators • The units of armed forces in the area shall provide communication network on the request of SEOC/DEOC
3	Medical Care & Public health	Dept. of Health and Family Welfare	<ul style="list-style-type: none"> • Hospitals coming under Directorate of Medical Education • Private Hospitals • Hospitals of other state & central government such as ESI, railway, military etc. • Dept. of Indian Systems of Medicine • Dept. of 	<ul style="list-style-type: none"> • Ensure sufficient supply of emergency medicine and basic life support equipment in the affected area • Coordinate the evacuation of patients • Provide services of health care professionals in the affected area • To prepare and keep ready Mobile Hospitals and stocks • To ensure the services of 	<ul style="list-style-type: none"> • Triaging • Perform medical evaluation and treatment as needed • Maintain a patient tracking system • Mobilization of the services of private health care providers as per requirement • In the event of 	<ul style="list-style-type: none"> • To perform the same functions as assigned to the primary agency • Provide manpower to the primary agency wherever available and needed • Make available its human resources & equipment to the primary

			Homeopathy • Dept. of Social Justice • Non-Governmental Organizations • Kerala Medical Service Corporation • Industries & companies	private health service providers as needed • To advice local self-government functionaries & sanitation works for mass decontamination • Assess fatality and injury and submit reports to DEOC & SEOC every 2 hours • Take control of all ambulances in the state/district and use for emergency response with the administrative support of the SEOC/DEOC	Chemical, Nuclear, Biological & Radiological disasters, to advice for mass decontamination of the affected population • Maintain record of dead and conduct post mortem	agency wherever needed and available • Provide trained voluntary support for triaging and crowd control within hospital area • Provide drugs and materials to the primary agency • Provide financial assistance to the victims for the event if due to industrial accidents
4	Sanitation/Sewerage Disposal	• Urban Affairs • Rural Development • Local Self Governments	• Public Works Department • Public Health • Kerala Water Authority • Non-Governmental Organizations • Industries & companies	• Make arrangement for disposal of waste • Arrange adequate material and human resource to maintain cleanliness and hygiene in the affected areas, relief camps and healthcare facilities • Assess damage for national assistance	• Deploy mobile toilets & mobile incinerators • Ensure cleanliness and hygiene in the affected areas, relief camps and healthcare facilities • To arrange for the disposal of unclaimed bodies and photographic record keeping thereof	• Repair the sewer & water supply pipe leakages immediately • Provide decontamination agents to the primary agencies to check, maintain sanitation • Provide voluntary support • Provide financial assistance to the government for sanitising the area in the event of

						industrial accidents
5	Power	KSEB	<ul style="list-style-type: none"> • District administration 	<ul style="list-style-type: none"> • Assess the requirement of external equipment such as generators, lighting, fans etc. • Early restoration of power supply in the affected area • Rapid assessment of damage for national assistance 	<ul style="list-style-type: none"> • Immediate restoration of power supply in the State/District EOC, Taluk Control Rooms, healthcare centres & relief camps • Review the total extent of damage to the power supply installations by a reconnaissance survey • Dispatch emergency repair teams to restore power supply • Clearing of damaged poles & wires etc. from roads & railways 	<ul style="list-style-type: none"> • Facilitate alternative power supply for emergency purposes • Make arrangement for and to provide alternative sources of lighting to the affected population and for the relief camps
6	Transport	Dept. of Transport	<ul style="list-style-type: none"> • KSRTC • Airport Authority • Air Force • Navy • KSWTC • All other Government Departments with fleets of vehicles 	<ul style="list-style-type: none"> • Overall coordination of the requirement of the transport • Inventory of vehicles available in the near vicinity of the affected area • Take over all necessary vehicles from public & private parties for the use 	<ul style="list-style-type: none"> • Arrange vehicles for transportation of relief supplies from helipads/airports to designated places • Arrange vehicles for transportation of search and 	<ul style="list-style-type: none"> • Make available its fleet for the purpose of Search & Rescue, transportation of supplies, victims etc. • Act as stocking place for fuel for emergency

			<ul style="list-style-type: none"> • All private vehicle owners 	of emergency management with the administrative support of SEOC/DEOC	rescue related activities	operations <ul style="list-style-type: none"> • Make available any vehicle to the District Administration based on requirement • Make available Ambulances to the Health Department • Airport Authority to coordinate for helicopter & air lifting services etc. required for transportation of injured, search & rescue team, relief and emergency supplies etc. as directed by SEOC
7	Search and Rescue (SAR)	<ul style="list-style-type: none"> • Fire & Rescue Services • Police Dog Squad • SDRF • Civil Defence • Home Guards 	<ul style="list-style-type: none"> • NDRF • Air Force • Navy • Army • Central Para military forces • NGOs • Trained Volunteers • Emergency Response Units of concerned 	<ul style="list-style-type: none"> • Establish a grid based search & rescue approach • Coordinate between departments by appointing nodal officers for search and rescue and logistics during field operations • Provide status reports of S&R updates every 2 hours to DEOC & SEOC 	<ul style="list-style-type: none"> • Search & Rescue • First degree triaging to decide on the priority of the patient condition and despatch to nearest health professional 	<ul style="list-style-type: none"> • Health & Family Welfare Dept., and Transport Department to make available ambulances as per requirements • Civil defence, home guards and NGOs to assist the primary agency in S&R • NDRF & other

			industry • SEOC			central forces to provide assistance to civil authorities on demand • Police to arrange for the transportation and post mortem of the dead • GIS to be used by SEOC to make an estimate of the damaged area and the deployment of the S&R team in the area according to the priority
8	Public Works and Engineering	• PWD • Water Resources	• CPWD • National Highways Authority India • Military Engineering Services • Railways	of • Emergency clearing of debris to enable reconnaissance • Establish a priority list of roads to be opened immediately in consultation with DEOC/SEOC • Clearing of roads • Assemble casual labour • Provide work teams carrying emergency tool kits, depending on the nature of disaster such as <ul style="list-style-type: none"> ▪ Towing vehicles ▪ Earth moving equipment ▪ Cranes etc 	• Open the priority roads • Construct temporary shelters • Ensure connectivity between healthcare centres, relief camps and S & R team stations • Install temporary road signs to guide and assist the S & R teams • Ensure connectivity	Making machinery and manpower available to the PWD and to keep national highways, railway lines, helipads and runways functional

				<ul style="list-style-type: none"> • Construct temporary roads • Keep national and other main highways clear from disaster effects such as debris, fallen trees, remains of collapsed building etc. • Enlist private construction firms for supply of earth moving equipment and road restoration equipment. 	between helipads, airports, relief camps and healthcare centres <ul style="list-style-type: none"> • Restore helipads 	
9	Relief supplies	<ul style="list-style-type: none"> • District Disaster Management Authority • DEOC 	<ul style="list-style-type: none"> • Dept. of Food and Civil supplies • Horticulture Mission • SupplyCo • Non-Governmental Organizations • Industries and Companies 	<ul style="list-style-type: none"> • Activate emergency powers under the DM Act, 2005 & delegate to necessary functionaries • Take possession of emergency stock of food and water for mass feeding • Coordinate bulk distribution of emergency supplies • Provide administrative support to response agencies • Coordinate damage assessment and post disaster need assessment 	<ul style="list-style-type: none"> • Command, control and coordinate all responding agencies • Ensure equitable distribution of available relief materials to all members of the affected community 	<ul style="list-style-type: none"> • To assist the primary agency in arranging and supplying relief materials • To assist the primary agency in running the relief camps • Provide financial support to Government for relief assistance to victims in the event of industrial accidents
10	Food and supplies	<ul style="list-style-type: none"> • Dept. of Food and Civil Supplies 	<ul style="list-style-type: none"> • Dept. of Revenue • Dept. Health & Family Welfare • Non- 	<ul style="list-style-type: none"> • Assess the requirement of food and clothing for affected population in association with 	<ul style="list-style-type: none"> • Provide emergency food and packaged drinking water 	Ensuring the distribution of food supplies to the affected population in the relief camps,

			Governmental Organizations	<p>Revenue officials</p> <ul style="list-style-type: none"> • Control the quality and quantity of food supplied in the relief camps and distributed to the affected community • Ensure that all food that is distributed is fit for human consumption 	<p>supplies available to the Revenue officials</p> <ul style="list-style-type: none"> • Ensure the provision of specific nutrients and supplementary diet for the lactating, pregnant women, infants, children and differently abled 	healthcare centres and isolated in the affected area
11	Drinking water	<ul style="list-style-type: none"> • Kerala Water Authority • Revenue Department 	<ul style="list-style-type: none"> • Local Self Governments (LSG) • Non-Governmental Organizations 	<ul style="list-style-type: none"> • Procurement of clean drinking water • Quality control of the drinking water for supply to the affected community • Transportation of water with minimum wastage • Ensure facilities for local first stage purification of the supplied drinking water at relief cam sites 	<ul style="list-style-type: none"> • Deployment of mobile water purification units • Ensure availability of safe drinking water to healthcare centres, relief camps and S & R team's bases camps 	To assist the primary agency wherever LSG is associated in the distribution of potable water
12	Relief Camps	Revenue Department	<ul style="list-style-type: none"> • Dept. of General Education • Dept. of Higher Education • Local Self Governments 	<ul style="list-style-type: none"> • Assess the affected population • Provide adequate and appropriate temporary shelter to affected population • Identify the area for the establishment of temporary relief camps 	<ul style="list-style-type: none"> • Operationalize temporary relief camps in the affected area or adjoin areas in which road/rail transport has been restored • Ensure 	<ul style="list-style-type: none"> • The General Education and Higher Education Department shall assist the primary agency in establishing temporary shelters of larger

				<ul style="list-style-type: none"> • Identification of public buildings as possible shelters & taking possession of the same • Identifying the population which can be provided with support in their own place and need not be shifted or relocated • Locate relief camps close to open traffic and transport links 	<p>unhindered supply of necessary relief material such as food, water, clothes and medicines</p>	<p>dimensions particularly in schools and higher education institutions in unaffected areas immediately close to the affected area</p> <ul style="list-style-type: none"> • LSGs would assist the primary agency in establishing shelters of smaller dimensions • Provide temporary LPG cylinders and stoves for cooking
13	Media	Information and Public Relations Department	<ul style="list-style-type: none"> • All India Radio • Doordarshan • All private audio-visual media • All print media 	<ul style="list-style-type: none"> • Provide and collect reliable information on the status of the disaster and disaster victims for effective coordination of relief work • Not to intrude on the privacy of individuals and families while collecting information • Acquire accurate scientific information from the SEOC regarding possible continuity of the disaster situation/early warning • Coordinate with SEOC 	<ul style="list-style-type: none"> • Use and place geographical Information to guide people towards relief operations • Use appropriate means of disseminating information to victims of affected area • Curb the spread of rumours • Disseminate instructions to all stakeholders 	<p>To assist the primary agency in discharge of its role</p>

				<p>at the airport and railways for required information for international and national relief workers</p> <ul style="list-style-type: none"> • Coordinate with all TV and radio networks to send news flashes for specific needs & warnings • Respect the socio-cultural and emotional state of the disaster victims while collecting information for dissemination 		
14	Help lines	<ul style="list-style-type: none"> • SEOC • DEOC 	<ul style="list-style-type: none"> • Information and Public Relations Department • HAM Radio Operators • Police Control Rooms • Taluk Control Rooms • Fire Force Stations 	<ul style="list-style-type: none"> • To receive distress calls from the affected people and coordinate with the field teams 	<ul style="list-style-type: none"> • Establish a victim tracking system by integrating information from various agencies and field teams • Assist family reunion 	To assist the primary agency in performing its job effectively and provide its manpower and resources for the purpose.
15	Animal care	Department of Animal Husbandry	LSGs	<ul style="list-style-type: none"> • Treatment of animals • Provision of vaccination • Disposal of dead animals 	<ul style="list-style-type: none"> • To arrange for timely care and treatment of animals in distress • Removal dead animals to avoid 	To assist the primary agency in performing its role

					<p>outbreak of epidemics</p> <ul style="list-style-type: none"> • Ensure adequate food and water to animals • Establish animal shelters 	
16	Law and order and traffic management	Police	Home Guards	<ul style="list-style-type: none"> • Security plan to coordinate law and order issues in the event of disasters in the affected area 	<ul style="list-style-type: none"> • Maintain law and order and traffic control as per the specific standard operating procedures • Ensure that at least 500 m surrounding a calamity affected area is cleared off civilian unskilled onlookers • Increase vigil against looting and rioting in the affected area • Ensure the safety and security of relief workers and material • Ensure specific measures for the protection of weaker and vulnerable sections of the society 	To assist the primary agency by making available manpower

					<ul style="list-style-type: none"> • Provide safety and security of relief camps and health care centres 	
17	Removal of trees	<ul style="list-style-type: none"> • Forest Department • Local Self Governments • Fire & Rescue Services • PWD • National Highways Authority 	Indian Railways	<ul style="list-style-type: none"> • Removal of fallen trees 	<ul style="list-style-type: none"> • Removal of trees obstructing the movement of traffic • Removal of trees which have become dangerous 	Ensure that railway network is uninterrupted and fallen trees are removed immediately
18	Flood water control	<ul style="list-style-type: none"> • Irrigation • KSEB 	Public Works Department	<ul style="list-style-type: none"> • Control of flood waters by diversion, operation of sluice gates, temporary impounding structures etc. under intimation to the district administration and downstream villages 	<ul style="list-style-type: none"> • Assess the possible path of flow of flood water • Identify the inundation prone areas and alert the district administration • Focus on protection of human habitation by diversion, timely operation of sluice gates and creating temporary impounding structures 	Support the primary agency with necessary human resource and heavy duty earth moving equipment

10.2 Annexure II: Form No. ESF-1

Form No. ESF-1

To be filled by all State Heads of Primary ESF Departments and submitted to Principal Secretary, Dept. of Revenue and Disaster Management in the period between March-May every year.

Government of Kerala
Department of _____

Subject: EMERGENCY SUPPORT FUNCTIONS (ESF) PLAN 2015

In compliance with the National Disaster Management Act, 2005, Section 40 (3), the following report is submitted to the State Executive Committee of KSDMA.

	Item	Available	Not Available
A	Human Resource		
B	Materials & machinery		
C	Financial Allocation		
D	Departmental Plan		

*Under Section 39 and 40 of the DM Act, 2005, it is mandatory for all state government departments to ensure a set of disaster risk reduction/response plans including financial arrangements. Please tick the applicable.

A. Human Resource - Nodal Officers in districts

District	Name and Designation	Contact Details including Mobile No. & Email
Thiruvananthapuram		
Kollam		
Pathanamthitta		
Alappuzha		
Kottayam		
Idukki		
Ernakulam		
Thrissur		
Palakkad		
Malappuram		
Kozhikode		
Wayanad		
Kannur		
Kasargod		

The nodal officers shall identify local field officers for the field level quick response and ensure that the details of these officers are kept readily at hand.

B. Materials and Machinery

District	Materials	Quantity		Machinery	Type	Location including contact details
Thiruvananthapuram						
Kollam						
Pathanamthitta						

Alappuzha						
Kottayam						
Idukki						
Ernakulam						
Thrissur						
Palakkad						
Malappuram						
Kozhikode						
Wayanad						
Kannur						
Kasargod						
Materials: Sand bags, rock boulders, food grains, fuel, coal tar, cement, agriculture seed stock, fodder stock, Drinking water etc.; Machinery: Earthmovers, tractors, electric cutters, pumps, boats, water transport tanks, water tanker lorries, etc. Other items may be added to this depending on need. Add contact details of the control officer or owner (in case of private machinery)						

C. Financial Allocation

District	Amount (in lakhs)	Head of Account	Permissible use
Thiruvananthapuram			
Kollam			
Pathanamthitta			
Alappuzha			
Kottayam			
Idukki			
Ernakulam			
Thrissur			
Palakkad			
Malappuram			
Kozhikode			
Wayanad			
Kannur			
Kasargod			

- It is certified that the aforesaid resources (manpower, services, material and equipment) are considered adequate for accomplishing the Emergency Support Functions assigned to this department.
- It is certified that in addition to above resources this department has entered in to pre-contracts for supply of resources are given in the attached Form No. ESF-02
- This department has issued authorization vide Order No. _____ dated _____, as at Form No. ESF-03 in favour of the nodal officers and the designated officers to deploy the resources in the event of disasters and in accordance with the requests received from the SEOC/DEOC
- The Departmental Disaster Management Plan has been last updated on ----- (dd/mm/yy)

Authorized signatory

Name:

Designation:

Date:

10.3 Annexure III: Form No. ESF-2: Rate-contract fixation form

Form No. ESF-2: Rate-contract fixation form

Government of Kerala

Dept. of _____

Sl. No.	Material/equipment/Services Description/specification	Qty. in Nos.	Qty. in Wt/Vol	Rate contract Location	Rate contract approved & validity period
1	Services				
2	Material				
3	Equipment				

To be filled by all District Heads of Primary ESF Departments and submitted to District Emergency Operations Centre in the period between March-May every year. Note that rate contract is mandatory for material & machinery. Materials: Sand bags, rock boulders, food grains, fuel, coal tar, cement, agriculture seed stock, fodder stock, drinking water (if not from Kerala Water Authority) etc.; Machinery: Earthmovers, tractors, electric cutters, pumps, boats, water transport tanks, water tanker lorries, etc. Other items may be added to this depending on local need.

Authorized signatory

Name:

Designation:

Date:

10.4 Annexure IV: Form No. ESF-3

Form No. ESF-3

To be issued by all departments listed in ESF Plan, 2015

Subject: Deployment of resources in the event of disasters - authorization thereof as per the ESF Plan – 2014

1. GO (Ms) 240/2010/DMD dtd 19/06/2010 – State Disaster Management Policy

The Department of Revenue and Disaster Management is the nodal department for coordinating relief and response in the event of both natural and manmade disasters, as per the State Disaster Management Policy, 2010 approved vide GO cited as 1st paper above.

In the event of a disaster, this department is required to provide emergency support to the Department of Revenue and Disaster Management in regard to the functions listed in the ESF Plan, 2014.

It has accordingly been decided, with the approval of the competent authority, to authorize the nodal officers and the designated officers in the field offices of this department to deploy resources in the events of disasters and in accordance with the requests received from the State Emergency Operations Centre or District Emergency Operations Centres under Department of Revenue and Disaster Management.

In case the resources are likely to be deployed for a period exceeding 72 hours, the officers concerned shall obtain necessary approvals of the competent authority for continued deployment. In such a situation necessary approvals may also be obtained for procurement and deployment of pre-contract resources, as the need may be.

Name & Designation of the officer

Copy to:

1. Principal Secretary, Revenue and Disaster Management, Govt. of Kerala
2. Member, KSDMA & Head, SEOC, KSDMA, ILDM, PTP Nagar, Thiruvananthapuram, Kerala
3. Nodal Officers
4. All District Collectors

10.5 Timeline of development of the handbook

- First draft prepared and sent to UNDP, India – 11th October 2014
- First draft released for consultation on 13th October 2014 (International Day for Disaster Reduction) at ILDM, PTP Nagar, Thiruvananthapuram by Honb'le Minister for Revenue and Disaster Management
- Second draft with inputs from UNDP, India – 28th October 2014
- Consultation workshop with line departments - 30th December 2014, Mascot Hotel, Thiruvananthapuram.

All departments invited were provided with printed color copy of the draft on 24th December 2014 for comments and remarks. A period of two more weeks were given for offering any further comments in writing. Attendees of the workshop were:

Sl. No.	Name	Department/Agency	Telephone Numbers	E-mail Address
1	Dr. Pushapagathan V	Addl. Director of Agriculture	09946048878	Pushpangagan105@gmail.com
2	Dr. B Jayachandran	Dept. of Animal Husbandry	09846177009	Dr.jbnair@yahoo.com
3	Smt. Deepa Martin	Deputy Director of Education, General Education	09446128983	dpikipkerala@gmail.com
4	Sri. B.K. Prasanthan Kani	Deputy Super indent of Police, HQ	09497990150	b.k.prasanthan@gmail.com
5	Sri. T S. Subash	Performance Audit Supervisor, Directorate of Panchayaths	09447002019	Subash34e@gmail.com
6	Dr. C K. Jagadeesan	Health Service	09447124413	drjagadeesan@yahoo.com
7	Sri. Subair Kutty. A	DSE, Deputy Director	09446848788	subairdd@gmail.com
8	Sri. S Abdul Nazar	Executive Engineer (Safety), KSEB HQ	09446008200	Nazar.kseb@gmail.com
9	Sri. Siji M Thankachan	SO, Office of State Disaster Management Authority	09447759655	keralasdma@gmail.com
10	Sri. B. Vijayakumar	Assistant Secretary, Civil Supplies	08547868647	-
11	Sri. Pradeep M S	DM Department, Govt. Secretariat	09645610480	pradeepms@gmail.com
12	Dr. Keshav Mohan	Director, ILDM		drkeshavmohan@gmail.com
13	Dr. Sekhar L Kuriakose	Member, KSDMA & Head, SEOC		Seoc.gok@gmail.com
14	Sri. Joe George	SPO, UNDP	09947756700	mailstojoe@gmail.com
15	Sri. Siju Thankappan	PF, SEOC	09400267973	sjuocean@gmail.com

16	Sri. Rajeev T R	PF, SEOC	09656665755	Rajeevtr8@gmail.com
17	Smt. Ponmani K Sasidharan	PF, SEOC	09544494824	ponmanissss@gmail.com
18	Ms. Lina Joseph	SEOC	09961402569	linakjoseph@gmail.com
19	Sri. Pradeep G S	JRF, SEOC	09895817557	pradeepgsgeo@gmail.com
20	Sri. Shibu Bose	SEOC	09745567720	-
21	Sri. Renjeev Kumar	ILDm	9387060830	-
22	Sri. Amrutha Thampi Rajan	JRF, SEOC	09446080628	Amrutha1102@gmail.com
23	Sri. Ninu Krishnan	JRF,SEOC	09526651893	-
24	Sri. Sruthi Ravindran	JRF, SEOC	09745875603	Sruthi1188@gmail.com
25	Sri. Manikandan	Section Officer, Dept. of Disaster Management	0471 - 2518113	revenuemdk@gmail.com
26	Sri. Vilasini	Section Assistant, Dept. of Disaster Management	0471 - 2518113	revenuemdk@gmail.com
27	Sri. Renuka	Section Assistant, Dept. of Disaster Management	0471 - 2518113	revenuemdk@gmail.com

- Finalized on 26th January 2015 after incorporating further comments received in writing from Directorate of Health Services (Email dated: 20th February 2015) and Directorate of Panchayats (Ltr. No. G2-12156/2012 dated 19-01-2015)
- Approved by State Executive Committee of KSDMA on 29th January 2015

Published by
State Emergency Operations Centre (SEOC), Kerala State Disaster Management Authority
Department of Revenue and Disaster Management, Govt. of Kerala

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