
MASTER PLAN MODULES **DISASTER MANAGEMENT GUIDELINES**

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1. INTRODUCTION TO DISASTER MANAGEMENT

1.1 Introduction and Relevance

Considering the locational aspects, concentration of pilgrims and types of activities at Sabarimala, it becomes imperative to prepare disaster management plan to deal with the natural and man made disasters.

The main vision of this document is to initiate coordinated efforts to have an effective disaster management strategy for Sabarimala, which will minimise the future disasters as well as their impacts. This also focuses on how extremely quick, efficient and coordinated response and recovery plans be put in place from the micro area to the regional level with a mechanism that will ensure increasing community participation in all disaster preparedness activities.

The ultimate vision is to have a disaster Sabarimala with total risk reduction as the planning, evaluation and monitoring parameter in all developmental initiatives so as to ensure safe pilgrimage for Ayyappa devotees.

1.2 Approach to Managing Disasters

Disasters are either natural, such as floods, droughts, cyclones and earthquakes, or human-made such as riots, conflicts and others like fire, epidemic, industrial accidents and environmental fallouts.

Disasters are characterized by some or all of the following:

- They are disruptive to individuals and communities;
- They are not part of day-to-day experience and are outside normal life expectations;
- They are unpredictable in occurrence and effects
- They require a response for which normal local resources may be inadequate;
- They have a wide range of effects and impacts on the human and physical environment;
- There are complex needs in dealing with them;
- They can be of sudden onset

The objectives of the Disaster Management Plan (DMP) are to ensure that the following components of disaster management are organized to facilitate planning, preparedness, operational coordination and community participation.

- Planning: the analysis of requirements and the development of strategies for resource utilization
- Preparedness: the establishment of structures, development of systems and testing and evaluation by organizations of their capacity to perform and their allotted roles.
- Co-ordination: the bringing together of organizations and communities and resources to ensure effective disaster management.

Three major functional areas recognized as necessary components of a comprehensive approach are prevention, response and recovery.

- Prevention: the elimination or reduction of the incidence or severity of disasters and the mitigation of their effects.

- Response: the combating of emergencies and the provision of immediate rescue and relief services;
- Recovery: the assisting of people and communities affected by disasters to achieve a proper and effective level of functioning.

Over the years the focus of disaster management shifted from “Rescue, Relief and Restoration” to “Planning, Preparedness and Prevention”. It is as much required to ensure pre-disaster risk reduction as is the preparing for post disaster relief following the dictum “Prevention is better than Cure”. Figure 1 presents a pictorial representation for pre-disaster preparedness and post-disaster response.

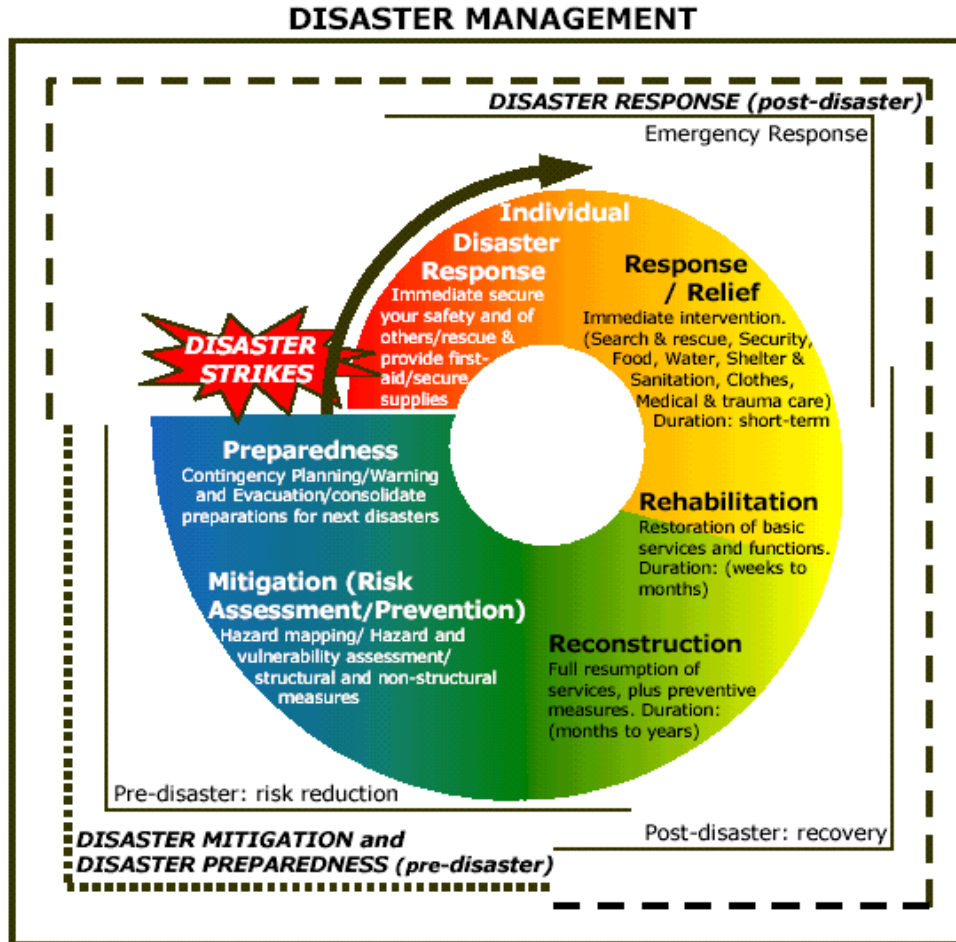


Figure 1 : Pre-Disaster Preparedness and Post-Disaster Responseⁱⁱ

ⁱ Source: Are you Prepared? Learning from the Great Hanshin-Awaji Earthquake Disaster- **Handbook for Disaster Reduction and Volunteer Activities**

2. DISASTER VULNERABILITY OF SABARIMALA

2.1 Disaster Conduciveness

Ex-situ disasters are used to denote such disasters, which have an impact on regional scale. As a result of such disasters certain impacts may occur at Sabarimala. While, insitu disasters are those which occur within the area under consideration, namely the micro-planning sub region comprising of Sabarimala, Pampa, Trek routes from Sabarimala to Pampa, Erumely to Pampa and Vandiperiyar / Sathram to Sannidhanam. Disasters like fire can be unmanageable

2.1.1 Vulnerability to Earth Quakes

It has been indicated that the rock exposures, landform and drainage pattern are indicative of a number of lineaments in and around the temple premises. The temple is located almost on one of the suspected weak plane and also near a suspected intersection of two lineaments. The lineament with an east - west alignment is already an active zone of erosion. Configuration of the Pampa and Kakki reservoirs also exhibit a prominent fracture direction.

2.1.2 Vulnerability to accidents

2.1.2.1 Vehicular Accidents

Apart from accidents to vehicles across the region owing to poor road networks, traffic management and pavement conditions, chances of accidents are high at Pampa. Vehicles are allowed till Pampa where they are parked at hilltop or Thriveni. These areas also share other pilgrim activities and religious activities. Thus this becomes a high risk zone for vehicular - vehicular conflicts and pedestrian – vehicular conflicts.

2.1.2.2 Congested Temple Precinct

The chances of accidents at the temple are more as the area available for spreading out in case of emergencies is almost non-existent. Cross movements and Grade separations in pilgrim movement also risk accidents. Circumambulation in flyovers raised above the ground in congested situation can lead to accidents.

2.1.2.3 Fuel Storage

The major issue with respect to fuel is the safety aspect related to storage of gas cylinders which are stacked in the most unsecured way at Sannidhanam and Pampa. Any slight mishap with respect to this may result in a major threat to the pilgrim safety. Diesel tanks located close to the temple, fire wood stored as stacks near hotels (even along pathways), gas cylinders stored for cooking purposes at Pampa and Sannidhanam by pilgrims and hotel operators may turn out as fire risk areas.

2.1.2.4 Religious Activities

Religiously important activities such as throwing 'neythenga' into aazhi, Pampa Vilakku where lots of lamps are lit and floated into the river etc can pose risk of fire.

2.1.2.5 Stampede

An unmanageable crowd in a mood of frenzy carries with it the threat of stampede and such an event can be catastrophic along the pilgrimage route, where the terrain is steep. The stampede and loss of several lives in 1998-99 is only a pointer to the emergency of the problem. Even a small chaos can culminate in a big disaster costing the lives of thousands in Sabarimala during the pilgrimage seasons.

2.1.2.6 Landslides

Landslide is a natural phenomenon. However, reckless human activities have contributed to an increase in the frequency of landslides. As per the study by the Centre for Earth Science Studies, there seems to be a relation between intensity of rain fall and slope failure in the Western Ghats. Improper landuse practices, degradation of vegetation cover and increased construction activity without proper consideration to slope stability have been the cause of frequent landslides in hilly areas. Landslides have occurred in past at Sabarimala resulting in death penalties and injuries to a large number of devotees.

2.1.3 Vulnerability to Biological Hazards

2.1.3.1 Epidemics

The area is susceptible to epidemics owing to pollution of Pampa and other water bodies. Improper management of wastes, lack of mechanisms to hold and treat sewage adds up to the vulnerability. Spread of pollution and epidemics all throughout the region also is possible as the river Pampa runs along through many thickly inhabited settlements down stream. Spread of epidemics on wild animals of the protected area is also possible as they are continuously exposed to humans and other animals which are in contact with humans throughout the year.

2.1.3.2 Forest Fires

Forest fire is a natural phenomenon. However, careless human activities often trigger large scale forest fires. The Sabarimala is surrounded by thick forest. Traditionally pilgrims trek nearly 8 km to 35 km through the thick forest area to reach Sannidhanam from various routes. The major vegetation types in the area include tropical evergreen, semi evergreen and moist deciduous. The pilgrim cook and rest along these routes. Though the tropical evergreen, semi evergreen forest is not prone to fires as they remain moist throughout the year, their assemblage with bamboo and reeds make them highly susceptible to fires. The reeds are prone to catch fires easily when they are dry. During the post-monsoon season and especially during the pilgrimage season, the reeds are dry and catch fire very often. Several incidences of forest fire from the Sannidhanam and surrounding areas have been reported during the pilgrimage seasons due to casual throwing of cigarette and *bidi* butts, un-extinguished cooking ovens (generally lighted with forest woods) leading to burning of grassland and loss of biomass. Often careless practices like burning of collected wastes and plastics underneath trees also lead to the forest fires. Forest fires are common around the Sannidhanam and by the sides of the pilgrim paths. Incidence of burning of 23 trees along Karimala to Azuthakadavu route has been reported. There have been significant attempts by the forest department to prevent and control fires during the pilgrimage seasons.

2.1.4 Vulnerability of critical infrastructure to hazards

2.1.4.1 Built Environment

Sannidhanam and Pampa are heavily built-up with temporary as well as permanent structures. Extensive ground coverage has reduced available area for crowd dispersal during emergencies. It also supports spreading of fire in case of an outbreak. In addition, use of combustible materials such as wooden poles to construct temporary dormitory accommodation and shops add to fire hazards. Loose nails used for construction, continuous construction activities also add to hazards during emergency evacuation.

The temple has history of fire incidents. Many of the structural supports of the temple are made up of logs and therefore prone to fire. Faulty and defective electrical system ignites a fire and can cause havoc during the pilgrimage season. Moreover, several guesthouses, hotels have popped up near the shrine without proper fire protection systems and can cause major disaster.

2.1.4.2 Breakdown of Infrastructure

Break down of critical infrastructure such as water supply system, sewage treatment system and other management mechanisms also could be considered as disasters as it hampers with normal or smooth conduct of operations. Such a condition may also be caused by striking or unwell employees. Impact of such disaster would be compounded by the absence of alternate means and ways to take care of the issue.

2.2 Note on Capability and Preparedness to deal with disasters

The user agency lacks infrastructure to manage such disasters. They have around 3000 staff posted at Sabarimala during the season, but without any training to manage disasters. Rescue and relief operations are arranged through Fire and Rescue Department. Fire stations functions at Sabarimala during the peak season from 15th November to 20th January. Five Fire Force camps are arranged in and around Sabarimala at Sannidhanam, Pampa, Plappally, Nilakkal and Perinadu.

There are 1 emergency tanker, 1 mobile tank unit, 1 ambulance and 1 jeep stationed at Pampa. There are 6 fire points at Pampa along Thriveni to Pampa temple, and many fire hydrants fed by river Pampa are laid along the stretch. At Sannidhanam 10 fire pumps are established. At Plappally 1 tanker and 1 mobile tank unit are established. At Nilakkal 1 recovery vehicle, 1 mobile tank unit are established while at Perunad 1 mobile tank unit functions. The fire stations at all the five locations are in temporary locations. The accommodation facilities and other amenities for staff are also quite inadequate. In total there are 250 staff deployed at Pampa, Sannidhanam, Plappally, Nilakkal and Perunad. However, there is no way the fire engine can reach the temple in case of fire. The temple and the guesthouses may have a few fire foam and carbon dioxide cylinders but its usability is limited in case of large fire.

Fire force personals are stationed at Sabarimala and Pampa during the pilgrimage seasons and a set of *mazdoors* are engaged on a daily basis to deal with fires in case of its occurrence. Since these *mazdoors* do not have any special training or the needed equipments, their effectiveness had been under doubt.

Police also is engaged in various disaster management operations and crowd control operations over and above their basic duty to maintain law and order. Accommodation and other facilities provided to them are meagre.

Co-ordination between various departments such as TDB, Police, Forests, District administration, Pollution Control board, Grama panchayats, NGOs, CBOs others are also not well advanced as mostly, preparations for the peak pilgrim season are not carried out well in advance.

Usage of modern techniques of communication, prediction and warning at Sabarimala is very limited.

2.3 Issues

Major issues are presented below:

- Lack of emergency preparedness among service personnel, the volunteers and pilgrims;
- Lack of continuous and efficient system for quality monitoring and dedicated personnel throughout the season. Currently, during the season, many officers are posted for short duration and are replaced by new set of personnel after their term during the same season;
- Water level in river Pampa falls during peak season resulting in constraints in availability of adequate water for emergency purposes;
- Lack of service access to Sannidhanam. Currently, same route as used by the pilgrims are to double up as service routes for emergency evacuation; and
- Lack of crowd dispersal facilities at Pampa and Sannidhanam

3. GUIDELINES FOR DISASTER MANAGEMENT

Currently, systems for managing the emergency are not in place at Sabarimala. It is required to prepare a detailed DMP with insights into identification of major accident hazards, possible emergency measures, responsibility delegation, procedure for conducting mock emergency evacuation drills, emergency contact numbers, possible evacuation routes, storage location and quantity of all significant inventories of hazardous and flammable substances, and training programs for capacity building. It is essential to develop a team with volunteer support to manage emergencies and render adequate training to them.

- Emphasis only on relief and reconstruction could only be an ad-hoc and short-term measure. The crying need is to have a holistic approach to disaster management and integration of prevention, response and recovery mechanisms with normal development process;
- Delayed response and poor early warning systems cause disproportionately high damage;
- Mobilization of resources in advance and strengthening of infrastructure are essential for evacuation and disaster proofing;
- Detailing minimum standards and operational procedures and making it mandatory through legal provisions that basic standards for all developmental works are implemented in a manner and with necessary prescribed quality standards to minimize risks of future disasters.

Following guidelines would pave the way for better management of disasters

3.1 Guidelines

Outlined concept is to develop an approach for managing disasters which is:

- All encompassing: dealing with all types of disasters
- Integrated: Involving all stakeholders
- Comprehensive

The main tasks identified for risk reduction are:

- Avoiding habitation in hazardous areas;
- Developing structures resistant to the onslaught of hazards;
- Developing the ability to rapidly evacuate hazardous areas and shift residents to hazard-resistant structures
- Reducing or eliminating natural hazards through technological intervention (e.g., dams, plantations, etc); and
- Establishing, through preparedness, the means to quickly recover from disasters with minimal additional suffering and loss of life.

3.2 Prevention of Disasters

This includes elimination or reduction of the incidence or severity of disasters and the mitigation of their effects. Prevention activities are carried out at full-effort in full swing all the time, regardless of the occurrence of actual disasters. Prevention strategies can be incorporated into recovery activities. Prevention involves:

- Identification of hazards;
- Determination of the levels of risk associated with those hazards; and

- Taking action to reduce potential loss or damage to life, property and the environment

Following are the steps involved to ensure disaster prevention

3.2.1 Categorisation of Disasters based on Risk levels

For prior identification of disasters and for preventing the same, following Disasters may be categorized and for each type of disasters each specified authority may need to prepare **sub-action plans**.

This “**Level**” (**L**) concept has been developed to define different levels of disasters in order to facilitate the responses and assistances to the area

L0 level denotes normal or ground 0 situation, which will be utilised for close monitoring, documentation, prevention and preparatory activities. Training on search and rescue, rehearsals, evaluation and inventory updation for response activities will be carried out during this time.

L1 level specifies disaster that can be managed at the site level, however, the State and Centre will remain in readiness to provide assistance if needed.

L2 level disaster situations are those, which require assistance and active participation of the State, mobilisation of its Resources for management of disasters.

L3 level disaster situation is in case of large scale disaster where the Local area, District, and State authorities have been overwhelmed and require assistance from the Central Government for reinstating the State and District machinery as well as for rescue, relief, other response and recovery measures. In most cases, the scale and intensity of the disaster as determined by the concerned technical agency like IMD are sufficient for the declaration of L3 disaster. Table 1 presents level of disaster and concerned agencies responsible for its management

Table 1 : Levels of Disaster and Concerned Authorities

<i>Level of Disaster</i>	<i>Example of Disaster Situation</i>	<i>Outline on How to Manage</i>	<i>Responsible Authorities</i>
L0 Level	Normal	Close monitoring, documentation, prevention and preparatory activities, Training on search and rescue, rehearsals, evaluation and inventory updation for response activities	User Agency (with participation of State departments such as Fire and rescue, health, police, district administration, pollution control board and NGOs/CBOs)
L1 Level	Sudden Health Casualty to a Pilgrim	Local arrangement to transfer the pilgrim to hospitals at site, treatment at the hospital. In case site arrangement is insufficient, transfer from the site to ambulance for conveyance to nearby hospital, ready cell at nearby taluk / district / medical college hospital to treat the case.	User Agency (through participation of other agencies and local communities (including pilgrims in this case)), additional support services by the State to be kept ready
L2 Level	Landslide, epidemic, others	Arrangements to transfer people at quick rate to the near by HCUs, augmentation of facilities and personnel by pooling in from other parts of the State, Mobilising Financial Resources	User Agency with active participation of the State

<i>Level of Disaster</i>	<i>Example of Disaster Situation</i>	<i>Outline on How to Manage</i>	<i>Responsible Authorities</i>
L3 Level	Natural calamities involving Massive Destruction to property, staff and pilgrims	Additional troops for rescue and relief from nearby States, funding support from the Centre	User Agency with support of State and Centre

Such planning would constitute a Trigger mechanism - an emergency quick response mechanism, which would spontaneously set in motion all disaster management activities for response and recovery without loss of critical time. This would entail all the participating managers to know in advance the task assigned to them and the manner of response.

3.2.2 Trigger Mechanism

The Trigger Mechanism has been envisaged as a preparedness plan whereby the receipt of a signal of an impending disaster or on the occurrence of sudden disaster would simultaneously energize and activate all response and mitigation mechanism without loss of crucial time. This would necessitate the participating managers to know in advance the tasks assigned to them and the manner of response. Identification of available resources, manpower, material, equipment and adequate delegation of financial and administrative powers are prerequisites to the successful operation of Trigger Mechanism. The Trigger Mechanism is, in essence, Standard Operating Procedure (SOP), which lays down in a scientific and comprehensive manner the implementation plans on receipt of a warning of impending disaster or plans to respond quickly to disasters that give no warning. Activities such as evacuation, search and rescue, temporary shelter, food, drinking water, clothing, health and sanitation, communication, accessibility and public information are important components of disaster management, which would follow on the activation of Trigger mechanism. These activities are common to all types of disasters and will require the preparation of sub-action plans by each specified authority.

3.2.2.1. Preparation of Sub Action Plans

A separate list of categorized disasters is to be prepared by the authorities and sub action plans be drawn up by respective functioning agencies at site. This should be carried out based on suggested standards by agencies such as Indian Meteorological Department, Fire Department, State Disaster Management Authority, etc.

Activities such as evacuation, search and rescue, temporary shelter, food, drinking water, clothing, health and sanitation, communication, accessibility and public information are important components of disaster management and should be planned through sub action plans for various types of disasters.

Sample list of Disasters and operating agencies responsible for preparation and implementation of sub action plans is presented in **Table 2**:

Table 2 : Proposed Institutional Responsibility for Preparation and Implementation of Sub Action Plans

Level of Disaster	Example of Disaster Situation	Responsible Authorities for Sub Action Plans
L0 Level	Normal	User Agency (TDB) with support of State Fire and rescue services department, Health Department, Police, District administration, Pollution Control Board, NGOs/CBOs
L1 Level	Sudden Health Casualty to a Pilgrim	Site level: User Agency (TDB), NGOs / CBOs, Health Department NGOs/CBOs, Local Panchayat State Level: District Administration, Near by Districts Administration, Health Department
	Local area Fire	Site Level: User Agency (TDB), with support of State Fire and rescue services department, Health Department, Police, Pollution Control Board, NGOs/CBOs State Level: District Administration, Near by Districts Administration, Health Department, Police Department, Fire and Rescue of near by areas, NGOs/CBOs, Panchayat
L2 Level	Landslide, epidemic, others	User agency and state State Level: District Administration, Near by Districts Administration, Health Department, Police Department, Fire and Rescue of near by areas, NGOs/CBOs, Panchayat
L3 Level	Natural calamities involving Massive Destruction to property, staff and pilgrims	User Agency with support of State and Central specialized Departments (IMD, research organizations), Central Support and Adjoining States
Sub Action Plans should include Prevention mechanisms, Response mechanisms and Recovery mechanisms.		

3.2.3 *Prevention Mechanisms*

3.2.3.1 *Planning, Legislation and Regulation of Landuses*

- Ensure development as per Master Plan guidelines
- Different land use patterns to be enforced with a defined area under tree cover
- Alternate arrangements for water, power etc such as Rainwater harvesting and watershed management to make area self reliable in order to function during infrastructure breakdowns
- Encourage conservation of forests
- Ensure earthquake resistant construction following National Guidelines and norms

3.2.3.2 *Regulation of Activities*

Activities which would harness or contribute to disasters need to be controlled. These include cooking in undesignated areas, carrying of fuel, explosives and sharp tools, tree cutting, uncontrolled movement etc which need to be regulated. Indiscriminate Fuel storage, waste dumping etc to be controlled and contained in designated areas only.

3.2.3.3 *Warning*

Most of the disasters could be predicted and the community likely to be affected forewarned about any impending disaster through a proper warning mechanism. Floods, droughts, cyclones, heat and cold waves, pest attacks, epidemics, industrial and chemical disasters are some of the disasters for which adequate warning could be given. Systems

for monitoring natural disasters need to be put in place with the help of other agencies. These warnings should act as trigger mechanism to initiate disaster prevention, risk mitigation activities

3.2.3.4 Awareness

Preparation activities such as sub action plans and training would assist various stakeholders to plan to deal with emergencies. Sufficient awareness need to be propagated to pilgrims in base camps regarding possible risks and support measures and others in the risk area to co-operate with the authorities managing the risk situation. For this communication systems and networking are important.

3.2.4 Response Management Arrangements

The response management task is to optimise the outputs, given the resource constraints. It is based on the three key management tasks of *command, control and coordination*. These roles and responsibilities are defined as follows:

3.2.4.1 Command

Command depicts the hierarchical managerial order. It elucidates the type and amount of resources that would be handled at different levels in the performance of that organization's roles and tasks. Command structure will be decided as per the rules within an agency/department.

3.2.4.2 Control

Control provides the direction for best possible utilization of resources and most advantageous deployment of manpower.

3.2.4.3 Coordination

Coordination involves the bringing together of agencies and elements to ensure effective response to emergencies. It is primarily concerned with the systematic acquisition and application of resources (agencies, personnel and equipment) in accordance with the requirements imposed by emergencies. Co-ordination aims at bringing out synergy in operation.

3.2.4.4 Response Services

This includes measures for combating of emergencies and the provision of immediate rescue and relief services. Response activities commence as soon as possible after the time of impact, peak to full efforts quickly and often ceases promptly after the disaster has been dealt with and/or affected people have been rescued or evacuated. This includes:

- Search and Rescue: detailed inventory of tools, support equipments in the region and methods to gather them in case of emergency
- Evacuation: emergency evacuation route plan and destination plan.
This involves directing evacuated people to a place of relative safety, usually to a shelter or an emergency relief centre. This includes registration of evacuees, the returning of evacuees to their homes, temporary facilities if evacuated persons must remain away from home for an extended period etc.
- Relief Centers: inventory of all hospitals in the region, open spaces, schools other public / semi public buildings

Ensure Support in relief operations through Response Activities:

- Provision of medical treatment / first aid
- Notification of hospital(s)
- Registration of persons evacuated or otherwise affected
- Provision of relief needs of evacuees, control and support agencies where necessary
- In consultation with the control agency, assess need for declaration of an emergency area.
- Maintenance of law and order around the emergency site
- Fact gathering for inquests or judicial inquiries
- Notification to relevant government and non-government agencies
- Co-operation with all participating departments/agencies and authorities
- Maintenance of proper records
- Bringing relevant matters to the notice of the appropriate agencies/authorities for action

These can be coordinated through:

Disaster Rapid Action Forces

- The first 72 hours are most crucial for saving lives in any emergency situation. It is generally agreed that human beings can normally survive without food and water for 72 hours. Therefore the role of emergency response team is paramount in any DMP.

Civil Defense and Local Communities

- The Civil Defense Units and local communities to be given training on self-defense, provide protection to any person or property, against any hostile attack, rescue trapped and incapacitated persons using improvised techniques, search for survivors after an incident, etc.

Voluntary Agencies and Community Based Organisations (CBOs)

- The role of the voluntary agencies and the CBOs which operate at the grass roots level is crucial in motivating and mobilising community participation in long-term disaster prevention measures and for improving community coping mechanism during disasters because of their close linkages with the local population and condition and flexibility in procedural matter. Also groups like NCC, NSS, to be harnessed

Mass Media

- The role of media is vital in educating the people about disasters; warning of hazards, gathering and transmitting information about affected areas, alerting government officials, relief organisations, and the public to specific needs and facilitating discussions about disaster preparedness and response leading to greater transparency in the whole operation.

Such Detailed Disaster preparedness plans to (multi hazard response plan) would

- Establish and maintain a failsafe communication network interconnecting various areas for dissemination and collection of information relating to disaster management.
- Institutional capacity building

- Capacity building of the communities and Community Based organizations to handle emergencies
- Preparation of Geographic Information System (GIS) for disaster mitigation and development planning
- Design and development of training programme for decision makers, elected representatives and the Civil Society groups.
- Coordination of NGO efforts

3.2.5 Recovery Activities

This includes assisting people and communities affected by disasters to achieve a proper and effective level of functioning. Recovery activities commence soon after the time of impact and peak to full effort more gradually and often later than response activities. Recovery activities may continue for a considerable period of time – (gradually tapering off and merging into normal community development activities) weeks, months or even years after the impact.

- Rebuilding
- Restoration
- Counseling
- Livelihood support
- Material aid
- Community programs
- Financial assistance

3.2.6 Overall Institutional Responsibility

A Disaster Management Unit which is, multi-disciplinary should be maintained and put in action year round which would co-ordinate with user agency and various state departments to ensure planning, response and recovery.

The roles of the user agency as envisaged in the Plan are:

- Planning, Monitoring and Evaluation
- Knowledge Networking and transfer, spread and adoption of improved and appropriate technology for disaster prevention, response and recovery
- Review, modification and adoption of appropriate laws, rules, codes and other measures to increase disaster management at all levels
- Incorporating disaster management aspects in normal developmental activities
- Financial Matters
- Building of Inventories
- Initiating Community Awareness Programme
- Gathering support from Government / other departments to train department officials from the State Headquarters and districts, members from the community and other stakeholders through a participatory approach
- Generating awareness through media and other IEC strategies and workshops for students, teachers and other stakeholders
- Documentation
- To maintain Support in Relief and rescue operations

3.3 Considerations in the Proposed Plan

Table 3 presents the essential considerations and materialisation as per proposal

Table 3 : Essential Considerations and Materialisation as per proposal

<i>Essential Considerations</i>	<i>Materialisation as per proposal</i>
Avoiding habitation in hazardous areas	<ul style="list-style-type: none"> – Accommodation at the highest risk areas namely, Sannidhanam has been kept at bare minimum at 10000. – Dispersed arrangements for Jyothi viewing to more accessible areas such as Pampa hilltop, Uppupara, Panchalimedu
Developing structures resistant to the onslaught of hazards;	<ul style="list-style-type: none"> – Maximum accumulation of pilgrims occurs at Queue Complex which should be as much open and hazard resistant – All new buildings at Sabarimala to be constructed using hazard resistant technology – Fire safety precautions to be adhered to – Well laid out and wide streets within settlements would aid regular placement of fire hydrants and support measures
Developing the ability to rapidly evacuate hazardous areas and shift residents to hazard- resistant structures	<ul style="list-style-type: none"> – Emergency Evacuation arrangements to be planned along the route to Uppupara and an alternate route to Pampa – Possibility of using goods ropeway for evacuation from Sannidhanam – Ensuring one way movement imposed by queue complex and keeping Swamy Ayyappan and Chandranandan roads free for easy uni-directional movement. Possibility of planning alternate evacuation route to be explored during Stakeholder consultation. – Pampa kept free of structures and clutter – All Routes in Sannidhanam, Pampa and Trek path made 10 - 12m wide to aid faster evacuation. Existing one way capacity from Pampa to Sannidhanam is 4800 pphr for slow movement while that after proposed widening would be for more than 18000 pphr for slow movement (26ppm). Swami Ayyappan road and Chandranandan roads also would evacuate @ 18000 pphr at a speed of 60 ppm – Service route for emergency vehicles at Pampa – Restricting parking at Pampa only for service vehicles – Ensuring only uni-modal transit provided by a particular authority only from Pampa till Nilakkal which would be easier to control in case of emergency requirement – List of schools, public buildings and open spaces in the vicinity and beyond to be prepared by user agency with support from other agencies as part of sub action plans presented in section 2.2.1. These places can be the holding areas / structures in the hazard free area – It has been proposed to develop transit camps and base camps and to augment the existing facilities in addition to general interventions suggested. These arrangements would support in holding and managing pilgrims outside the region in case of emergencies – In the long term it has been proposed that base camps and transit camps be upgraded to regional base camp conglomerates with interlinked transportation and other networks which would support amore

<i>Essential Considerations</i>	<i>Materialisation as per proposal</i>
Reducing or eliminating natural hazards through technological intervention (e.g., dams, plantations, etc);	<p>facilities, faster movement, retention and rescue</p> <ul style="list-style-type: none"> – Proposed to undertake retaining walls, bio engineering to retain soil profile in degraded lands, immediate post season restoration works – Proposed Layout to free intrusive buildings and to open out space around the temple would increase the possible area to spread – Buffer of evergreens reduces spread of fire – Cordoned off infrastructure such as SWM, STP etc within buffers reduces risk of spread of disasters here to other parts – Restricting temporary accommodation at Sannidhanam reduces spread of fire etc – Infilling landscape into the otherwise urban like sprawl would increase ground stabilisation – Restriction / guidelines on ground modification and vertical / horizontal expansion of layout would improve stability and conformity with natural settings which would prevent disasters – Retaining and conserving the forests in the areas around the temple increases area to spread and less chances of causalities – Controlled movement of pilgrims rather than an unrestricted chaotic movement supports easier evacuation – Strict guidelines on safety standards – Services and utilities in underground conduits
Establishing, through preparedness, the means to quickly recover from disasters with minimal additional suffering and loss of life	<p>As described in section 2.2</p> <ul style="list-style-type: none"> – Route planning and Development (refer Traffic and Transportation) – Health Amenities network Planning – Ensured Water supply for fire fighting (inbuilt into design consideration) – Permanent Fire Station at Nilakkal and Fire base at Pampa with accommodation for staff – Co-ordination between various agencies through a dedicated cell

3.4 Preparation of a Detailed DMP for Sabarimala

Considering the locational aspects, concentration of pilgrims and types of activities at Sabarimala, it becomes imperative to prepare a detailed disaster management plan to deal with the natural and man made disasters here with insights into identification of major accident hazards, possible emergency measures, responsibility delegation, procedure for conducting mock emergency evacuation drills, emergency contact numbers, possible evacuation routes, storage location and quantity of all significant inventories of hazardous and flammable substances, and training programs for capacity building. It is also essential to develop a team with volunteer support to manage emergencies and render adequate training to them. The Disaster Management Plan should aim to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. As the preparation of DMP would have a different subjective and temporal focus when compared to the Master Plan, it is suggested that a detailed plan be prepared through another professional agency. Based on the review of disaster proneness of the area and other parameters identified during the preparation of the Master Plan for Sabarimala, a ToR to prepare a detailed DMP has been provided. The ToR is presented in Annexure 1.

ANNEXURES

Annexure 1: Terms of Reference for Preparation of a Disaster Management Plan for Sabarimala

Name of the Project: DISASTER MANAGEMENT PLAN FOR SABARIMALA

Client: Government of Kerala (GoK) and TDB

Duration of the Study: 5 Months (150 Days)

BACKGROUND

Considering the locational aspects, concentration of pilgrims and types of activities at Sabarimala, it becomes imperative to prepare a disaster management plan to deal with the natural and man made disasters here. Sabarimala has a history of recurrent natural and man made disasters. The area is at risk for earthquakes, landslides, floods and forest fires. In addition, man-made/caused disasters including accidents, stampede, epidemic, building fire, etc have resulted in a high number of casualties in the past. Hence it is required to prepare a detailed Disaster Management Plan with insights into identification of major accident hazards, possible emergency measures, responsibility delegation, procedure for conducting mock emergency evacuation drills, emergency contact numbers, possible evacuation routes, storage location and quantity of all significant inventories of hazardous and flammable substances, and training programs for capacity building. It is also essential to develop a team with volunteer support to manage emergencies and render adequate training to them.

In this perspective GoK intent to invite consultants to prepare a Disaster Management plan which will aims to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. As the preparation of DMP would have a different subjective and temporal focus when compared to the Master Plan, it is suggested that a detailed plan be prepared through another professional agency. Based on the review of disaster proneness of the area and other parameters identified during the preparation of the Master Plan for Sabarimala, a ToR to prepare a disaster management plan has been provided.

PURPOSE

The purpose of the Disaster Management Plan is:

- To review and suggest changes in the existing arrangements for preparedness and mitigation of natural and manmade disasters.
- To recommend the strengthening requirements of existing organizational structures
- To prepare model disaster management plans at the micro and macro levels for supporting Sabarimala pilgrimage.

SCOPE OF WORK

The original mandate of the Consultant is confined to preparation of Emergency plans for Natural and manmade disasters. The consultant are to develop a plan de novo, but should give due consideration to what exists at different levels and streamline such bottlenecks as may be existing considering the number and type of disasters/ accidents that Sabarimala has been witnessing.

During the time frame assigned to the consultant, the team would assess the capacity and quality of existing Emergency Preparedness and Response System at local and district levels, by using a combination of written surveys, interviews and site visits. The assessment should consider the preparedness to deal the possible hazards like:

Natural: Landslides, floods, inclement weather, epidemics, Forest fires, attack of wild animals etc

Manmade: Contamination and food poisoning, Terrorism, Sabotage, theft, panic Vandalism etc

Technological: Accidents, Building/structural collapse, Explosion (gas/fuel), Power /utility failure etc

Suggested methodologies for the assessment

The Study teams shall, in close consultation with the experts /Officers in-charge designated by the GoK:

- Bring together a wide range of disaster related readings and processes from all over the world and trying to understand the various systems of response that have been implemented all over the world.
- Try to understand the common element of response in order to bring out a well thought-out and planned Response Mechanism for Sabarimala.
- Take into account the lessons learnt from past experiences.
- Review the existing legislation, regulations, plans, strategies and instructions related to disaster management;
- Review regional context of the disaster management, agreements, mitigation, emergency and disaster management strategies and clearly identify Sabarimala and its institutions play in implementation of these plans and agreements;
- Review exhaustively the capacities and mandates of the existing institutions participating and stake in the disaster management coordination and action;
- Review resource sourcing and disbursement required for mobilizing an effective disaster response, including building confidence and assurance of financial prudence and fairness in the expending of disaster funds;
- Develop a consensus on best practice application tailored to the conditions, organizational, political and cultural context of Sabarimala, for a mechanism and operational procedure for addressing disasters and the related recovery action.
- Prepare the necessary documentation for the required approval processes for the adopted disaster management operation.
- Operationalize the adopted mechanism ensuring a clear and comprehensive understanding and capacity for all involved institutions to carry out their respective roles; and
- Develop champions and leaders to guide orderly and systematic Disaster management operations, including support preparation, monitoring and coordinating the relevant documentation.

Outputs

A comprehensive report, in English, shall contain, but not be limited to:

- Measures for efficient forecasting and warning
- Existing system of response mechanism in the wake of natural and man-made disasters at all levels of government/semi government/NGO/Private and steps to minimize the response time through effective communication and measures to ensure adequacy of relief operations.

- Development programs related to mitigation of disaster management in different areas and priorities and strategies for inclusion of disaster reduction components in the on-going plan/non-plan schemes.
- Measures for intensive training for building human resources to improve awareness and capabilities
- Public awareness programs to build up pilgrims and local community's resilience to disasters.
- Pro-active measures for disaster preparedness and mitigation - administrative, financial, legislative and techno-legal.
- Measures and programs to harness the State - of art Information Technology for effective communication network.
- Networking mechanism by government/non government organization
- Updating of codes, manuals, management plans, items of relief, and norms of assistance of State Governments.
- Examining building practices/codes at Sabarimala and present a mechanisms for hazard mitigation.
- Structural measures for disaster mitigation and preparedness - improving design of check dam's rising, renovation/de-silting of ponds, improved emergency draining systems, retaining structures/embankment to check landslides, etc
- Formulate a trigger mechanism or an 'emergency quick response mechanism' which sets into motion the required prevention and mitigation measures without any loss of time with the primary objective of reducing to the extent possible, the human misery and loss of resources.
- Identify and analyse all disasters possibilities, under various categories, Water and climate, Geological, Biological, industrial and Accidental, based on generic considerations.
- Any other matters incidental or related to natural. Man-made or technological disasters.

A summary report, in English, which shall be in addition to the main report and contain the key findings and key recommendations of that report.

The outputs shall address:

- Disaster Prevention and Mitigation Plan: which elaborates how disasters can be reduced / prevented
- Emergency Preparedness plan covering Vulnerability and risk assessment, awareness, warnings, mitigation, Communication, Emergency operations, recovery, training and capacity building of institutions, specific institutional set up and resource allocation
- Emergency response procedure covering search and rescue, Emergency medical services, Incidental Management system, Institutional set up and resource allocation, Fire and safety measures , Security and law enforcement
- It should cover all the following and any other disasters, (but not limited to):
- Water, environment and climate related hazards
- Geological hazards
- Chemical/Industrial disasters
- Accident related disasters
- Biological disasters

It should make elaborate use of detailed maps and technology to explain and plan for response.

The DMP can draw extensively from the Disaster Management Guidelines Sub – Module of the Master Plan for Sabarimala. Based on the DMP, various agencies should be able to effectively group up, get trained and manage disaster situations.

The plan should

- Focus on Disaster Prevention or control at the first instance by planning, providing and networking various agencies / users and awareness generation
- Focus on Four levels : Developmental phase, disasters to be handled at district, state or central level
- Focus on provision for immediate action following the declaration of level is imperative.
- Focus on creation and management of an intelligent integrated database, which should be updated for focused, measured and fine-tuned information for quick and effective response in a disaster situation.
- Focus on knowledge-based learning process should be encouraged for better information:
 - Traditional and local knowledge
 - Advanced scientific information
- Focus on integrating the response mechanism of the local action groups, community, Civil Defence set-up can be utilized for disaster response and mitigation.
- Focus on Examination of the scope and possibilities of disaster insurance and equity in provision of rescue services across all sections and age groups
- Organisation of Important Activities

The Study teams shall, in close consultation with the experts /Officers in-charge designated by the GoK, will have to initiate:

- Consultation with key actors in the Government, non government agencies, private sector, donors involved in disaster management and preparedness.
- Consultation with other stakeholders such as community leaders, victims and beneficiaries.
- Review of documents, risk maps, policies, laws, regulations, data (demographic, health etc), existing guidelines, training modules, proposals, plans of action, budgets and human resources.
- Site visits to high risk and affected areas – hospitals and health centres, warehouses, health and other departments at the local and district levels, logistics assets

DELIVERABLES

Descriptive reports in sections detailing various aspects of the total plans at macro level and micro level, with plans and maps as required showing proposed facilities, land use details, layout details as requirements for implementation, design character images, specific schemes, financial and institutional aspects and documentation Implementation (in hard and soft copies)

TASK PRODUCTS AND TIMING

The Consultant shall produce reports in complete form, which would adhere to all aspects of the scope of work. The reports/should make liberal use of maps, drawings, and tables for presenting the information, analysis and designs. The overall responsibility for the quality of the assignment will rest with the consultant. The reports should be in a form suitable for review and appraisal by any Government/Non Governmental agencies.

The selected consultant shall prepare the following reports.

Inception Report: (3 copies)

The consultants should, after the preliminary study, submit an inception report based on which the detailed terms under which such a plan preparation of the detailed Disaster Management Plan. This report shall identify the major components and concerns with respect to disaster management and give

the work plan defining various tasks, their duration and inputs required to respond to the ToR. This report shall be prepared and submitted within 15 days of commencement of work.

Macro Level Plan: Strategy formulation

This shall be prepared and submitted based on analysis of data, review of existing situation, and further development of the agreed perception during the earlier phase (consultation process) of the study. This should be accompanied by relevant details and should be submitted by the end of 60 days of award of work. This should also include regional transport and hospital network identification for emergency evacuation and treatment

Micro Level Plan: Development Plans (6 copies)

Based on the agreed Macro Level Plan, the consultant shall produce Micro Level Disaster management action Plans with all required details for implementation and this should be submitted by the end of 120 days of agreement on Macro Level Plan. It should detail out the plan to deal with each type of disaster at Sabarimala, Pampa and Nilakkal and the accesses connecting these places.

Final Report: (6 copies)

Final Report including Disaster Management Strategy, its development, Macro level Plans, Micro Level action plans in a phased manner other relevant details should be submitted after incorporating the comments of all stakeholders, by the end of 150 days of award of work.

Text materials and tables and drawings shall be prepared using one or more widely available applications software packages. (With CD and transparencies if any for preservation. All reports submitted by the consultant will be the property of the department. These would be submitted in a format to the satisfaction of the department. The consultant will not have the right to disclose any information pertaining to the project.)

PERIOD OF STUDY

It is expected that the entire work in all respects shall be completed at the end of 5 months from the date of signing the Agreement between the client and consultant or the issue of work order, whichever is earlier.

CONSULTANT TEAM

The study is interdisciplinary and will need inputs from Disaster management experts, Urban and Regional Planners, Infrastructure experts, Alternate Technology Specialists, Environmental Engineers, Ecologists, financial experts, Sociologist etc. Consultant shall mobilize for all the tasks to be performed, a team of specialists from all required relevant areas as stated.

ⁱ **Source:** *Are you Prepared? Learning from the Great Hanshin-Awaji Earthquake Disaster- Handbook for Disaster Reduction and Volunteer activities*