



DISASTER MANAGEMENT PLAN

**Department of Economics and Statistics
Government of Himachal Pradesh
Shimla - 171002**

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1 ABOUT THE DEPARTMENT

The Department of Economics and Statistics in Himachal Pradesh is functioning since the year 1955-56. The Directorate of Economics & Statistics came into being with the objective to advise the state government on Economic and statistical matters for formulation of policies and plan. The mandate of the department is to assess the economic development of the state through the estimation of State Domestic product/presentation of economic scenario of the state through fact and figures, census and survey & studies.

The main functions of the Department are to build firm and broad data bank for the Pradesh so as to serve as useful data base for all plan and policy formulations, bring out the estimates of GSDP/State Income and the economic growth, conduct of various studies and Surveys and coordinate various Statistical activities of different departments in the state.

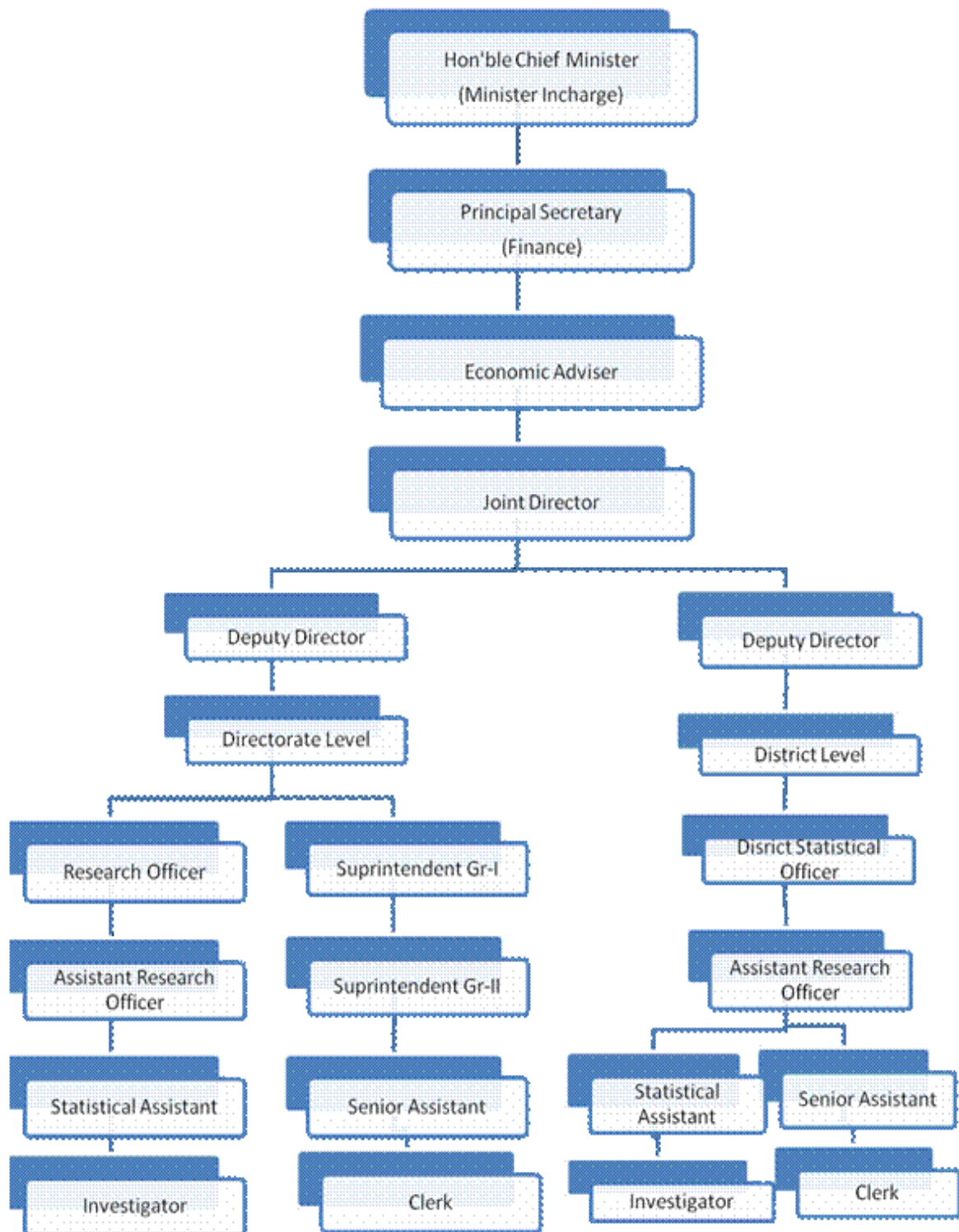
Objective of the Department:

- To make available data/statistics on some key parameters to Planners and Policy makers and decision makers in Government and outside.
- To improve the quality and reliability of existing data sets and to simplify and standardize data collection, compilation and analysis method.
- To make available new data sets on emerging fields to meet the demand of policy makers and planners.
- To reduce time lag in bringing out Statistical information.
- To conduct survey and studies as per the priorities of the State Government.
- Human Resource Development with special reference to effective use of Information Technology in collection, compilation and analysis of statistical data.

• ORGANIZATIONAL STRUCTURE

Economic Adviser is the “Head of Economics and Statistics Department. Besides Directorate as the Headquarters of the department each district is having the office of District Statistical Officer. The department presently is having in its cadre strength 1 Joint Director, 2 Deputy Directors, 17 Research Officers, 28 Assistant Research Officers, 42 Statistical Assistants and 24 Investigators as Technical Staff and on Administration side 1 Superintendent Grade-I, 1 Private Secretary, 2 Superintendent Grade-II, 17 Senior Assistants and 22 Clerk, 1 Senior Scale Stenographer, 1 Junior Scale Stenographer and 35 Class IV employees are functioning in the department. The total staff strength at the State Headquarters is 59, there are 7 sections to discharge the functions and duties as assigned under the rules of business of Himachal Pradesh Government.

Organisation Chart of the Department of Economics & Statistics



1.2 PURPOSE OF THE PLAN

The need for disaster management plan for Department of Economics & Statistics, so that the officials can efficiently work during mass disaster. There are certain fundamental principles which should be thoroughly understood by everyone who may have responsibility for helping the victim of a disaster, it is important that these principles be applied in the proper sequence; otherwise they lose effectiveness or cause even more deaths and injuries.

Main purpose of this Disaster Management Plan (DMP) is to reduce the risk level through preparedness at various levels.

- DMP helps to bring together the information related to equipment, skilled manpower and critical supplies.
- It helps to know the standard operating procedures of the department at the time of disaster.
- To fix the role and responsibility of each and every officer for disaster preparedness.
- It helps the Department to assess its own capacity in terms of available resources and get ready to mitigate any unexpected disaster effectively and to prevent the loss of human lives and property through preparedness, prevention & mitigation of disasters.
- To assist the line departments, block administration, communities in developing compatible skills for disaster preparedness and management.
- To disseminate factual information in a timely, accurate and tactful manner while maintaining necessary confidentiality.
- To develop immediate and long-term support plans.
- To have response system in place to face any eventuality.

1.3 SCOPE OF THE PLAN

In accordance with the Disaster Management Act 2005 and Himachal Pradesh State Disaster Management Plan 2012, the plan must include the following:

- Identify the vulnerability of different parts of the State to different forms of disasters in context of the department;
- The measures to be adopted for prevention and mitigation of disasters;
- The manner in which the mitigation measures shall be integrated with the development plan and projects;
- The capacity-building and preparedness measures to be taken;
- The roles and responsibilities of different departments of the Government of the State in responding to any threatening disaster situation or disaster;

1.4 AUTHORITIES, CODES, POLICIES

For the functions related to Disaster management following guidelines are to be followed:

- Disaster Management Act, 2005
- National Disaster Management Plan, 2016
- Himachal Pradesh Disaster Management Plan, 2017
- National Action Plan on Climate Change
- National Guidelines issued by the NDMA
- Guidelines and provision for State Disaster Response Fund (SDRF)

- Guidelines for administration of the National Disaster Response Fund (NDRF)

1.5 INSTITUTIONAL ARRANGEMENTS FOR DISASTER MANAGEMENT

The State Government has adopted the Disaster Management Act 2005 as enacted by the Govt. of India for providing an effective mechanism for Disaster Management in the State of Himachal Pradesh.

1.5.1 State Disaster Management Authority

As per clause b of sub-section (2) of Section 14 of the Disaster Management Act 2005, the Himachal Pradesh Disaster Management Authority under the chairperson of the Honourable Chief Minister was constituted on 1st June 2007 with the following persons as a member of the Himachal Pradesh Disaster Management Authority (HPSDMA):

Table 2: Members of State Disaster Management Authority

S. No.	Member	Designation in HPSDMA
1.	Hon'ble Chief Minister	Chairman
2.	Hon'ble Revenue Minister	Co-Chairman
3.	Chief Secretary	Member
4.	Principal Secy. (Rev)	Member
5.	Principal Secy. (Home)	Member
6.	Principal Secy. (PWD)	Member
7.	Principal Secy. (Health)	Member
8.	Director General of Police	Member
9.	Secretary/Additional Secretary (Revenue)	Member Secretary

1.5.2 State Executive Committee (SEC)

As per sub-section (1) of section 20 of the Disaster Management Act 2005, the State Executive Committee under the chairmanship of Chief Secretary was constituted by the Government of Himachal Pradesh. SEC coordinates and monitors the implementation of the National Policy, the National Plan and the State Plan in addition to management of disasters in the state. It monitors the implementation of disaster management plans prepared by the departments of the Government of the State and District Authorities.

1.5.3 Advisory Committee of SDMA

As per Sub Section (1) of section 17 of the Disaster Management Act 2005, the chairperson of Himachal Pradesh State Disaster Management Authority nominates members of the Advisory Committee to assist the Authority and to make recommendations of different aspects of Disaster Management.

1.5.4 District Disaster Management Authority

As per Section 25 of the DM Act 2005, District Disaster Management Authority has also been constituted in every district of Himachal Pradesh which is chaired by the Deputy Commissioner of the district.

1.6 PLAN MANAGEMENT (MONITORING, REVIEW AND REVISION)

The nodal officer appointed for the disaster management by the department shall be responsible for all plans and implementation of plans and decisions taken from time to

time for the same.

DM Plan is a “Living document” and would require regular improvement and updating. The plan must be updated at least once a year. The Disaster Management plan prepared by the Department shall be circulated to all its district offices. The Plan shall be shared on the Departmental portal. The plan will be updated as and when required and modified plan shall be communicated to the key stakeholders.

For the annual review of the disaster management plan participation of different stakeholders will be ensured by inviting them to workshops. Based on their feedback, necessary changes will be incorporated into the plan.

Dissemination of Plan

The primary responsibility for dissemination of the plan will be with the Department of Economics & Statistics. Department would involve HPSDMA for capacity building at different levels of training and dissemination. The Disaster Management Plan will be disseminated at three levels: District authorities, government departments, NGOs and other agencies and institutions within the State. The content of the plan would be explained through well designed and focussed awareness programmes. The awareness programmes would be prepared in the local language to ensure widespread dissemination up to the grass root level.

Disaster Management Plan will be uploaded to the department website. A printed document will be supplied to all the stakeholders. Meetings and seminars will be held to disseminate the Disaster Management Plan.

2 HAZARD, RISK AND VULNERABILITY ANALYSIS

2.1 RISK ASSESSMENT OF HIMACHAL PRADESH

The state of Himachal Pradesh is exposed to a range of natural, environmental and man-made hazards. Main hazards consist of earthquakes, landslides, flash floods, snowstorms, avalanches, GLOF, droughts, dam failures, fires, forest fire, lightning etc. Enormous economic losses caused due to natural disasters such as earthquakes, floods, landslide, avalanche, etc., erode the development gain and bring back economy a few years ago. Most of the fatalities and economic losses occur due to the poor construction practices, lack of earthquake-resistant features of the buildings and low awareness about disasters among people. In order to estimate and quantify risk, it is necessary to carry out the vulnerability assessment of the existing building stocks and lifeline infrastructure.

The physical vulnerabilities of Himachal Pradesh include the unsafe stocks of houses, schools, hospitals and other public buildings and infrastructure that may not withstand the shocks of powerful earthquakes. The economic vulnerabilities are mainly the productive assets like industries, hydropower stations, reservoirs, tourism facilities etc. located in hazard zones. Any disruption of these facilities due to disasters may badly affect the economy of the State. The socially vulnerable groups in the State, like most of the States, are the rural and urban poor, the vulnerable women, children, disabled, aged etc. who suffer an unequal burden of disasters. The delicate ecology and environment of the State further make it highly susceptible to the hazards of landslides, forest fires and flash floods. Most of these risks of disasters have accumulated over the years while new risks of disasters are created unwittingly with the process of development.

2.2 ASSESSMENT OF SECTORAL AND DEPARTMENTAL RISKS

As a state grows over years, importance of statistical data pertaining to past years also increases. In order to meet the demand of various users of old statistical data, this publication brought out by the Department of Economics and Statistics. The data present could be used for preparedness and awareness and to meet the challenges posed in managing pre and post disasters and provide information to strengthen the capacity and capability of various organizations of the state government and other stakeholders entrusted with the responsibility of implementing Disaster Management Plan.

Statistics play a crucial role in dealing with disasters, from preparation to recovery and reporting. The need for timely and accurate data is especially significant in light of the increasing frequency and severity of climate change-related extreme weather events. However, the data needed for effective disaster risk reduction is not always readily available when needed. It is therefore important to strengthen the role of official statistics as they provide key data relevant to all phases of disaster risk management.

Earthquakes

Himachal Pradesh is highly seismic sensitive state as over the years a large number of the damaging earthquake has struck the state and its adjoining areas. Large earthquakes have occurred in all parts of Himachal Pradesh, the biggest being the Kangra earthquake of 1905. The Himalayan Frontal Thrust, the Main Boundary Thrust, the Krol, the Giri, Jutogh and Nahan thrusts are some of the tectonic features that are responsible for shaping the

present geophysical deposition of the state. Chamba, Kullu, Kangra, Una, Hamirpur, Mandi and Bilaspur Districts lie in Zone V i.e. very high damage risk zone and the area falling in this zone may expect earthquake intensity maximum of MSK IX or more. The remaining districts of Lahaul and Spiti, Kinnaur, Shimla, Solan and Sirmour lie in Zone IV i.e. the areas in this zone are in high damage risk with expected intensity of MSK VIII or more.

Landslides

Landslides are one of the key hazards in the mountain regions particularly in the state of HP which cause damage to infrastructure i.e. roads, railways, bridges, dams, bio-engineering structures, and houses but also lead to loss of life, livelihood and environment. According to the analysis carried by TARU in 2015, 6824 villages of the state falls under high landslide risk zone whereas 11061 villages are in the medium risk zone. 824 villages are in the low-risk zone of landslides.

Floods/GLOFs

In Himachal Pradesh, flash flood due to cloudburst is common phenomena. The state experiences riverine flooding of varied magnitude almost every year and Sutlej and Beas are most vulnerable rivers. All the villages and property inside the floodplain and near close vicinity are in the vulnerable zone. According to TARU report (2015), about 59 villages in Beas basin and 280 villages in Sutlej basin are potentially at risk due to inundation caused by river flooding.

TARU investigated 11 existing lakes in the state. According to their analysis, out of 11 (eleven) glacier lakes, few glacier lake in each basin are more vulnerable. According to modelling output and inundation maps of Chenab Basin, area falling under the vulnerable zone of Lake 8 and lake 7 are at utmost risk. In Ravi basin area falling under the vulnerable zone of Lake 5 and lake 6 are at maximum threat. Volume and area wise Glacier lakes in Sutlej basin are not so vulnerable when compared to glacier lakes of Chenab and Ravi basins. But numbers of villages falling within the inundated vulnerable zones are quite high in Sutlej basin.

Climatic Exposures

Health hazards of exposures to extreme climate may lead heat stroke, frostbite etc. But death from exposure does not appear to be a major risk as long as the population is reasonably well clothed in the state of Himachal Pradesh.

Epidemic

In certain circumstances disaster does increase the potential for disease transmission. However, it does not usually result in an outbreak of infectious diseases. Fecal contamination of water and food frequently increases the outbreak of disease. The risk of communicable disease is proportional to population density and displacement. In the long run, an increase in vector-borne diseases may occur in certain areas as the insecticides may be washed away and the breeding sites of mosquitoes may increase. Figure 2 and 3 provides the details of a number of persons affected by waterborne and vector-borne diseases respectively during 2007-15.

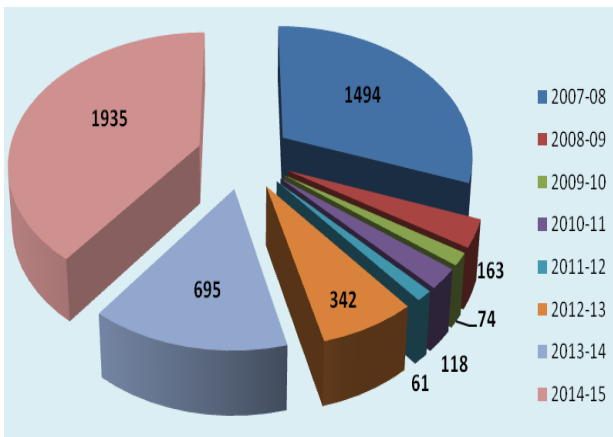


Figure 2: Number of persons affected with water borne diseases (2007-15)

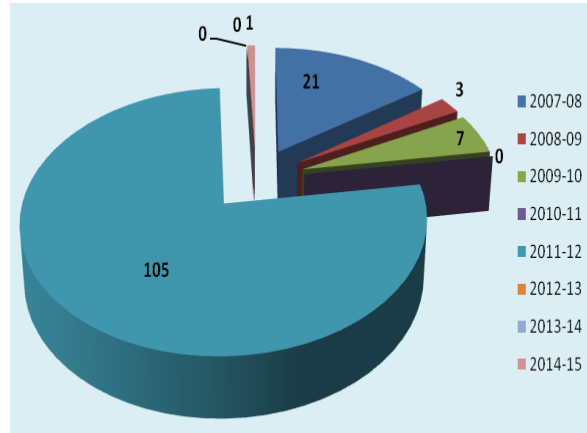


Figure 3: Number of persons affected with water borne diseases (2007-15)

Road Accidents

With the increase of road connectivity and a number of vehicles plying on these roads in the State, the number of road accidents and loss of precious human lives is increasing day by day. Figure 4 shows the trend of the number of accidents and the victims.

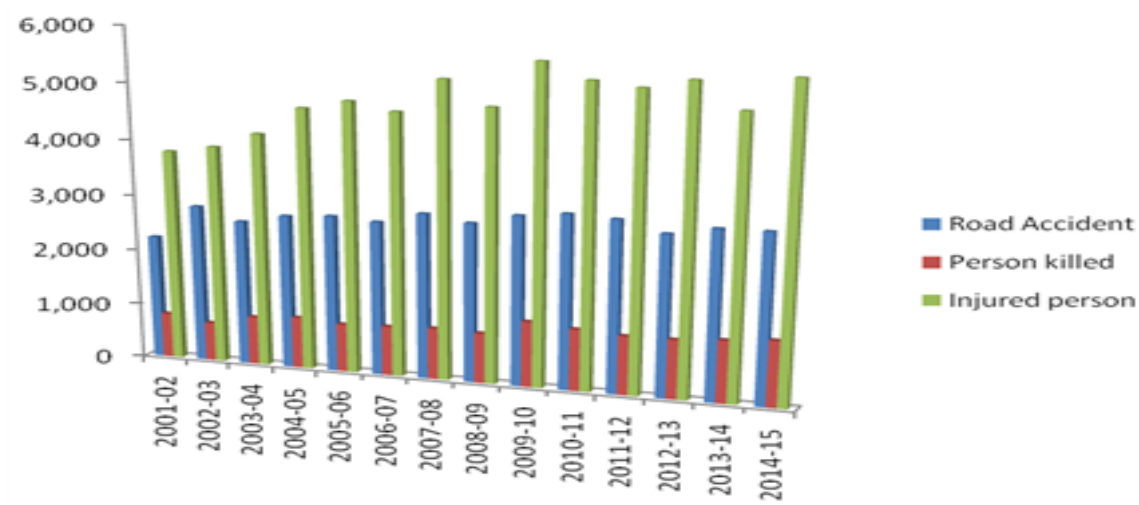


Figure 4: Road Accidents in State (2002-15)

The risk involved for the health department when exposed to different types of disasters in view of data available and past experiences are summarized in table 5.

Table 5: Types of risks while exposed to different disasters

Sl. No.	Hazard	Risk
1	Earthquake	Very High Risk: Distribution of Health infrastructure over space is directly proportional to population distribution. In Himachal Pradesh 60% population lives in the very high-risk zone; 38 % population lives in a high-risk zone and the rest of population lives in moderate to low-risk zone. Limited awareness, Preparedness, structural weaknesses of the buildings and high population density in Health institutions reveal very high vulnerability to daytime earthquake and low capacity. This suggests very high risk.
2	Flood	High Risk: Topography of Himalayan river valleys, glacial fed rivers, damage or sudden release of water from power project dams and densely populated former river beds poses a high risk.
3	Cloudburst	High Risk: Impact of cloudburst is dual. It leads to landslides and flash floods. Settlements on river terraces are at high risk.
4	Landslide	High Risk: landslides pose risk to buildings and disruption in road and communication network. Landslides also choke rivulets and form temporarily lakes. When these lakes burst causes flash floods.
5	Avalanche	Low Risk: Six districts viz. Hamirpur, Una, Bilaspur, Mandi, Sirmour, and Solan have no risk of avalanche. Further Kangra, Chamba and Shimla have a medium risk. Kullu falls in the high-risk zone, whereas Kinnaur and Lahaul Spiti are in the very high-Risk zone. Further, there is a small proportion of the population living in High and very Avalanche risk-prone districts. Low vulnerability suggests Low risk.
7	Fire	Medium Risk: Climatic conditions and topography of the State compel to use timber in Hospitals building in very high quantity. Fire incidents pose risk to Health infrastructure with staff and patients.
8	Road accident	Medium Risk: Steep slopes, Sharp bends in roads, poor road conditions, overloaded buses causes accidents.

2.3 GAPS IN EXISTING CAPACITY

Officers and staff are lacking in the basic knowledge of disaster management and response. Human resources of the department need training on management and mitigation of different type of disasters including relief, rescue and rehabilitation. Department also needs to establish a monitoring mechanism at district level to check the Disaster management plans at the district level. For this a pool of resource persons is needed in each district to help in the preparation of safety plans. It will also be helpful in the auditing of these plans at grass root level to ensure the implementation of the concerns of risk reduction. Adequate financial powers need to be vested with the district, sub-division and dispensary level to manage the crisis and setting up of adequate safety measures in the premises, such as Disaster Preparedness Kit, Fire Extinguishers etc.

3 RISK PREVENTION AND MITIGATION

3.1 RISK PREVENTION

The need for systematic data for disaster mitigation and prevention is an increasing concern of both development and response agencies. In the past, data needs were addressed on an ad hoc basis, which included collecting the information at the time of the emergency. However, there is a growing importance and understanding that data collection, analysis, and management can help both short and long-term development goals and help to identify and address disaster risks.

The evolution of technology has allowed public and private sector organizations to capture, store, and analyze data in a structured way. UNISDR believes that capturing the composition, spatial distribution, and impacts of disasters is the first step in addressing disaster risks and finding solutions to build resilient communities. UNISDR has translated this belief into training and supporting governments to develop disaster loss databases, as well as to work with a variety of partners to share data.

The exposure and vulnerability modules of disaster management calculate the effect of a hazard with respect to the assets and the population of the affected area. A critical component of any disaster risk model is the exposure module. In this module the elements at risk are categorized in a way that lends itself to the estimation of their vulnerability to that particular hazard. This requires the categorization of the elements at risk by their structural type, their height and their period of construction. The structural typology greatly influences the vulnerability of elements at risk, e.g. buildings from timber or steel may be stronger, while buildings made from traditional materials such as adobe may be weaker to the earthquake hazard. The period of construction also influences the vulnerability of the elements at risk because design regulations are gradually improved taking into account local and global hazard loss experiences.

Exposure Module uses the following data for its analysis:

- Building Construction types – Steel, Concrete, Masonry
- Height, No. of storey and age of the Buildings
- Occupancy and Type of Occupancy
- Type of Building – Residential, Commercial, Industrial
- Type of Structure
- Built area and non-built area of the building

Vulnerability of the area is calculated in terms of both the physical and social functions. Social vulnerability is the susceptibility of populations to death and injuries, the assessment of which involves casualty modeling to compute mortality and injury rates associated with various catastrophic events. The physical vulnerability refers to the degree to which an asset would get damaged or destroyed in a hazardous environment caused by catastrophic events. The vulnerability module quantifies the damage susceptibility of each asset class with respect to varying levels of ground motion and collateral hazards.

Advantages of Having Reliable and Complete Data:

- Accurate distribution of buildings in the area insures the accurate distribution of losses. This is of particular importance in case of flood hazards where the banks of the river, more prone to disaster are farther from central congested areas of the city. If the data was not accurate at the specified scale, the losses presented by the models would be skewed.
- The accuracy of population data of the buildings is important in case of casualty modeling. Casualty modeling uses the population data to stimulate the extent and number of casualty a particular hazard can cost.
- As per our observations while modeling disasters, most of the census data which is available is of residential areas while the more disaster prone commercial and industrial areas are not covered well. Lack of data for commercial and industrial zones result in inaccurate distribution of losses and therefore reduce the applicability of the models.

3.2 RISK MITIGATION

Risk mitigation is reducing the risks of disasters that are already there due to exposure of vulnerabilities to the hazards. Mitigation projects reduce the level of exposures or the depth of vulnerabilities or both through a combination of various structural and non-structural measures. Structural mitigation refers to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure. Non-structural mitigation refers to policies, awareness, knowledge development, public commitment, information sharing which can reduce risk.

3.3 MATRIX OF HAZARD SPECIFIC MITIGATION MEASURES

HAZARD	MITIGATION MEASURES	
	STRUCTURAL	NON-STRUCTURAL
Earthquake	<ul style="list-style-type: none"> • Undertaking mandatory technical audits of structural designs of infrastructure under department by the competent authorities. • Retrofitting and reinforcement of old and weak structures. 	<ul style="list-style-type: none"> • Seismic hazard risk mapping pertaining to departmental assets. • Developing appropriate risk transfer instruments by collaborating with insurance companies and financial institutions.
Floods, Flash Floods and GLOF	<ul style="list-style-type: none"> • The department should demarcate the flood-prone area and no construction should be done there. • Open space for emergency construction of sheds etc. shall be left to the extent possible 	<ul style="list-style-type: none"> • Flood mapping pertaining to departmental assets. • Mitigation plan should be in place to safeguard the departmental infrastructure/inhabitants from the flash flood.
Landslides	<ul style="list-style-type: none"> • Selecting alignments for construction of YSS centres which are less prone to landslides. 	
Fire	<ul style="list-style-type: none"> • Open space for emergency exit in the case of fire. • Fire extinguishers should be installed in YSS centres. • Replacement of dilapidated electrical wires. 	<ul style="list-style-type: none"> • Fire safety mock drill.

3.3 STRATEGIES FOR RISK PREVENTION AND MITIGATION

The Departments that do not usually have adequate budgetary allocations on risk mitigation may have to develop strategies for risk prevention and mitigation for short, medium and long-term basis. The National and State policies, Guidelines and Plans on disaster management shall provide strong justifications and support for such investments. The Departments should make use of these instruments for justifying their proposals for risk prevention and mitigation projects. Otherwise, the Departments have always the opportunities for mainstreaming disaster risk reduction in the existing programmes, activities and projects.

When preparing for disasters and assessing risks, statistics are useful for analyzing existing risks, informing the public about future risks, and planning actions to prevent disasters. For instance, statistical data are important for identifying high-risk areas or conditions, and for planning appropriate ways to provide early warning to people and prevent serious damage to infrastructure, buildings and transportation.

During a disaster, emergency response and recovery teams use statistics to get data on population and information on infrastructure and services located in the area. After the disaster, statistics help to mitigate the impact of the disaster and estimate the damage, losses, and disruption to functions and services caused by the event.

Statistics are particularly useful for disaster risk analysis when linked to the geographical location as it enables detailed local and regional analysis. To react to this need, statistical offices are increasingly working together with geospatial experts.

Most statistical offices have not been directly involved in collecting and providing data specifically for disaster risk management. This is because not all statistical offices are fully aware of the exact data needs or have the capability to produce data to meet the specific needs.

The whole landmass of the Himachal Pradesh is in Seismic Zone IV or in Zone V. An Earthquake of magnitude 8 or above will lead to a large number of injuries, loss of life, and damage to hospital infrastructure. In such a scenario life of medical staff members is in more danger. If no action is taken right now, the problem will worsen due to population growth, construction of unplanned buildings and poor knowledge of construction agencies regarding geotechnical considerations in making risk free constructions.

4 MAINSTREAMING DISASTER RISK REDUCTION IN DEVELOPMENT

4.1 POLICY FRAMEWORK ON MAINSTREAMING

Disaster Management Act has stipulated that DM Plans of the Departments of State Government shall integrate strategies for prevention and mitigation of the risks of disasters with the development plans and programmes of the department. The State Policy on Disaster Management, following the National Policy, prescribed 'DRR Mainstreaming' in the following words:

"The DRR issues would be mainstreamed in development plans, programmes and policies at all level by all the departments, organisations and agencies. It would be ensured that all the development programmes and projects that originate from or funded by Government are designated with evident consideration for potential disaster risks to resist hazard impact. That all the development programmes and projects that originate from or are funded by Government do not inadvertently increase vulnerability to disaster in all sectors: social, physical, economic and environment. It would also be ensured that all the disaster relief and rehabilitation programmes and projects that originate or are funded by Government are designed to contribute to development aims and to reduce future disaster risk."

The Himachal Pradesh State DM Plan 2012 has one full chapter on 'Mainstreaming DM Concerns into Development Plans/Programmes/Projects'. The Plan has proposed strategies for integration and mainstreaming DRR into a few flagship national programmes in the sectors of rural and urban development, education, health and public works department. Some of these programmes have undergone changes in the recent years but the strategic entry points for mainstreaming DRR in development plans remain the same. Concerned Departments may, therefore, incorporate structural and non-structural measures for disaster risk reduction into the projects according to the contexts of local situations within the broad framework and guidelines of the programmes. For example, construction of school buildings under Sarva Siksha Abhiyaan may conform to the standards of seismic safety even if this involves higher costs. If the guidelines of the programme do not permit higher costs, the State Government may bear the additional costs involved from their own sources. Therefore, mainstreaming may involve innovative adaptation of national programmes according to local contexts for disaster reduction. Many State Governments have made such innovative adaptations which the Departments may like to consider on their merits.

With the abolition of Planning Commission and devolution of higher tax revenue to the States, many central sectors and centrally sponsored plan programmes are undergoing changes. The State Governments shall, therefore, have greater freedom to design state specific development programmes and projects. This will create new opportunities for disaster risk reduction. The Departments are therefore well advised to propose specific programmes of disaster risk reduction in their respective sectors, based on the assessment of risks in their sectors and the likely benefit of such programmes.

Every Department of the State Government implements state-level development programmes that provide good entry points for mainstreaming DRR in development. The Departments may, therefore, explore the possibilities of mainstreaming DRR in as many existing programmes and projects as possible. This will ensure that existing development projects are not creating any new risks of disasters; on the contrary, the projects are designed in such a manner that these would facilitate the process of risk reduction without any significant additional investments.

4.2 MAINSTREAMING DRR IN PROJECT CYCLE MANAGEMENT

The best way to ensure that DRR is mainstreamed into the development projects is to integrate this into the Project Cycle Management (PCM). PCM is the process of planning, organizing, coordinating, and controlling of a project effectively and efficiently throughout its phases, from planning through execution, completion and review to achieve the pre-defined objectives at the right time, cost and quality. There are six phases of PCM - programming, identification, appraisal, financing, implementation and evaluation. The first three phases are the initial planning phases of the project which provide key entry points for mainstreaming.

Among the various toolkits available for mainstreaming DRR in project cycle management the following may apply with relative ease in Himachal Pradesh.

a) Marginal Investment Analysis

Existing investments can be so designed and calibrated that these do not exacerbate the latent risks or create new risks of disasters. Incorporation of elements of risk resilience in the concept, design, management and evaluation of existing and new programmes, activities and projects may necessitate additional investments. The tools of marginal investment analysis are used to determine the effectiveness of such additional investments for disaster risk reduction. For example, school, hospitals, roads, bridges and buildings, can be so designed that with marginal additional investments these structures may become resistant to the hazards of earthquake or landslides. The marginal higher costs in earthquake-resistant buildings are 2.5% for structural elements and 0.8% for non-structural elements, but the benefits are higher than the replacement costs of these structures if these collapse in earthquakes.

b) Multi-purpose development projects

The projects can be designed with dual or multi-purpose that can reduce the risks of disasters and at the same time provide direct economic benefits that would enhance both cost-benefit ratio and internal rate of return and justify the costs of investments. One of the most common examples of such multiple purpose development projects are large hydroelectric projects that generate electricity, provide irrigation and at the same time protect downstream locations from the risks of floods. Many innovative multi-purpose projects can be designed that can offset the costs of disaster risk reduction.

c) Check Lists for disaster risk reduction

The government of India issued a notification in 2009 which makes it mandatory for any new project costing more than Rs. 100 crores to have a *Check List for Natural Disaster Impact Assessment* before it is approved. These checklists provide complete information on the hazards, risks and vulnerabilities of the project. These include not only the probable effects of natural disasters on the project but also the possible impacts of the project in creating new risks of disasters. The costs involved in the prevention and mitigation of both types of impacts can be built into the project costs and accordingly the economics and viability of the project can be worked out. Similar checklists for DRR can be followed in large development projects of the Departments.

Role of Census Data & Population in Disaster Management

Steps will be taken to monitor the efforts of mitigation and preparedness in each institution. A monitoring mechanism will be established at State, district and block level. In the inspection criteria of the buildings, one additional element of safety audit will be included. District Research Officer will prepare the guidelines for a safety audit of the Institutions in consultation with respective DDMA/HPSDMA.

In recent times there has been a significant increase in the frequency and occurrence of natural calamities. In addition to the wide scale devastation caused, these calamities have a direct negative impact on people and population. To mitigate the devastation caused by these catastrophes, it is imperative to have accurate and complete information on population distribution at the desired demographic scale.

Risk assessment is the central pillar of the hazard risk management framework. Risk is defined as the probability of a loss occurring. It depends on the frequency and intensity of the hazard, the people and structures exposed to those hazards, and their vulnerability.

The information provided by the assessment contributes to an informed decision making process that reduces the chances of surprises, and enables consequences to be managed and planned for in advance. The census information in most of the developing and under developed countries is not frequently updated. Moreover, the available information does not have information on the micro level spatial distribution of population. This becomes a potential bottle neck for effective disaster management analysis and mitigation strategies.

5 DISASTER PREPAREDNESS

5.1 STRATEGIES FOR DISASTER PREPAREDNESS

Data and statistics are important in understanding the impacts and costs of disasters. Systematic data collection and analysis can be used to inform policy decisions to help reduce disaster risks and build resilience. Disaster-related datasets vary in the methodology they use to collect data, and as such vary in geographic scope and resolution of data. In recent decades, the systematic collection of data for disaster mitigation and prevention has rapidly increased. In the past, data needs were addressed on an ad hoc basis. However, there is a growing understanding of the importance of data collection and analysis can help both short and long-term development goals and assist in identifying and addressing disaster risks.

Disaster loss databases allow us to explore patterns and trends of disaster risk based on past events. Understanding these patterns and trends can help us to anticipate future losses from extensive events (frequent events) as well as understand whether disaster risk management is effectively reducing this kind of risk. Disaster loss databases vary in their approach, including the threshold for what qualifies as a disaster, as well as in the methods used to collect the data. Disaster loss and damage datasets do not provide a full picture especially for less frequent and larger events which have not happened yet.

Socio-economic indicators: Socio-economic indicators help us to assess and monitor socio-economic vulnerability and resilience to disasters. Both poverty and inequality are key drivers and consequences of disaster risk, so indicators of these can allow us to assess and track changes in vulnerability over time. However, the resolution of these national indices can hide great disparity at the local level, emphasizing why vulnerability and risk assessment needs to occur at all levels.

The Sendai Framework has seven targets. It aims to bring about substantial reductions in disaster deaths, the number of affected people and economic losses, plus damage to critical infrastructure and disruption to basic services such as health and educational facilities.

It also seeks to increase the number of countries with national and local risk reduction strategies – by 2020, the earliest deadline in the framework and a key step for meeting the other targets – as well as bolstering the capacity of developing countries, and vastly increasing coverage by early warning systems.

National disaster loss databases are also crucial to producing and acting upon risk information that, in turn, advances appropriate policy making and risk governance. They also serve as basic mechanisms for reporting on the Sendai Framework targets. Data collection is pivotal to the comprehensive assessment of disaster impacts. Risk interpretation, with standardized loss data, can also provide loss.

5.2 MEASURES OF DISASTER PREPAREDNESS

Disaster loss data can be collected and recorded by multiple sectors - governments, technical experts, DRR researchers, the private sector, the general population, volunteers and insurance authorities. However, it is vital to acquire data in a standardized format to enable effective data sharing. Although data sharing is subject to various factors such as

data ownership, data restrictions, data use provisions and acknowledgment of data sources, over all it reduces data acquisition costs and time.

Risk assessment requires damage and loss data to quantify risk. The impacts of hazards on infrastructure, people and society are typically complex to model accurately. Instead, we tend to rely on empirical models or probabilistic modelling using big data such as global, regional and local hydro-meteorological, geo and socio economic databases. To conduct such assessments requires calibration using historical losses. Standardizing disaster loss data quantification identifies gaps in risk assessment, simultaneously improving disaster risk information.

PDNA will also be about the disaster preparedness and Disaster Risk Reduction as a long term recovery strategy for reducing the vulnerabilities and reducing the risk of disasters. It would document about the Emergency preparedness, Risk Assessment, Promotion of safe housing, improving resilience to critical public and government infrastructures, school safety programme, water, sanitation and hygiene promotion and protecting the natural resources for reducing the risk of disasters.

Post Disaster Needs Assessments (PDNA)

In the aftermath of disasters, affected countries need to invest significant resources to address recovery needs. These should be guided by a comprehensive assessment that estimates damages and losses, and identifies the needs of the affected population. This *Post Disaster Needs Assessment (PDNA)* is the first step towards developing a holistic recovery programme that promotes equity and inclusion.

The PDNA tool was developed by the UN Development Group, the World Bank and the European Union as one of the key commitments of their 2008 agreement to develop and use common assessment and recovery planning approaches in post-crisis settings. The main goal is to assess the full extent of a disaster's impact, define the needs for recovery, and, in so doing, serve as the basis for designing a recovery strategy and guide donors' funding. A PDNA looks ahead to restoring damaged infrastructure, houses, livelihoods, services, governance and social systems, and includes an emphasis on reducing future disaster risks and building resilience.

In an effort to make PDNA a critical tool widely applicable, UNDP organizes training programmes at global, regional and national levels. UNDP also maintains a roster of PDNA experts who are deployed to support assessments in the aftermath of a disaster, and guidelines on the PDNA are available.

The Department of Economics & Statistics will strengthen the District Research Officers as well as the State Officials by undergoing the trainings and workshops conducted on Post Disaster Needs Assessments. Also the department can coordinate with HPSDMA & HIPA to organize a Training of Trainers on PDNA and Disaster Recovery Index which will help creating a statistical enhanced database of trained personnel in the department which can be useful at the time of Disaster Response & Recovery.

6 DISASTER RESPONSE AND RELIEF

6.1 RESPONSE PLAN

Disasters are continuing to affect many millions of people across the world and are occurring with increasing frequency. Following both natural and man-made disasters, relief efforts provide assistance to help affected communities to cope with the impact. Sport and physical activity can play a valuable role in helping people affected by disasters, particularly in the early phases of relief.

‘Loss and damage’ is an emerging topic in climate change negotiations, research and policy as well as in the implementation of climate change action. It also connects the fields of climate change adaptation and disaster risk reduction. Loss and damage results from inadequate efforts to reduce greenhouse gas emissions and insufficient capacity to adapt to climatic changes, to reduce the risks associated with climatic stressors and to cope with the impacts of climatic events.

Post Disaster Assessment

One of the main objectives of a post-disaster assessment is to estimate the impact of the event on overall socio-economic development in the affected country or area. To estimate total disaster impact, two components are normally estimated: first, the economic impact that represents the consequences of the destruction of physical assets and of the changes in production flows arising from the event that triggered the disaster, on overall economic conditions and performance; second, the impact on human development that represents the consequences of the disruption of the population’s normal livelihoods, employment and income as well as access to basic services of health and education.

A subsequent estimation of post-disaster financial requirements to achieve recovery and reconstruction is possible only after disaster impact has been determined. One of the main features of disaster impact assessment involves the estimation of the disruptions caused by the disaster on the macroeconomic performance of the affected country or area. This is usually made in comparison to the expected or foreseen performance of the main macroeconomic variables of the country or area in the absence of a disaster, by superimposing into it the estimated isolated effects of the disaster on the destruction of physical assets and on the resulting changes in the flows of production of goods and services. Based on such projections of post-disaster macroeconomic performance, a set of activities aimed at restoring pre-disaster economic performance and including disaster-resilient reconstruction standards may be designed, constituting a strategy for recovery and reconstruction.

The destruction of physical assets (defined as damage) and the changes in production flows caused by any disaster may have an impact or consequences on the value and growth of the economy of the affected country, whenever the affected area is large and whenever strategic sectors of economic activity have been affected. In spatially concentrated cases of disaster, such impact may not be significant at the macroeconomic level; however, individual sectors of activity may show high levels of impact, and the affected individual persons or households may suffer a considerable negative impact on their living conditions, including employment and income decline and increased costs of living after a disaster.

Consideration needs also to be given to possible disaster cases where a region of a country is heavily and negatively impacted so that its future economic growth is pushed below its pre- or non-disaster potential, while the overall impact on the national economy is negligible. Such disaster-affected regions may not be able to recover and reconstruct without receiving targeted assistance from the central government.

The impact of the disaster is to be measured with respect to a baseline given by the expected or forecasted performance of the national or regional economy if the disaster had not occurred. To clarify, the value of sectoral production flow changes is to be superimposed on the performance of the economy that had been forecasted (before the disaster occurred) for the current and several subsequent years, for the entire country or for the affected areas. This superposition would enable measuring the “delta” on economic growth caused by the economic shock imposed by the disaster.

Step-Wise Procedure to Estimate Disaster Impact

Three stages are required to determine whether there is any resulting negative or positive impact on the macroeconomic performance of a country affected by a disaster. In the **first stage**, only the isolated effects of the disaster in terms of changes in economic flows, assuming no recovery and reconstruction interventions, are considered; in the **second stage**, the positive impact of economic recovery activities is estimated, after the needs for economic recovery have been estimated separately; and, in the **third stage**, the positive impact of disaster-resilient reconstruction activities is estimated, after the needs for reconstruction with risk reduction features have been estimated.

Post Disaster Needs Assessments (PDNA)

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The PDNA is a multi-sectorial and multidisciplinary structured approach for assessing disaster damages, losses, impacts and needs that will lead to the development of a recovery and reconstruction plan. As a tool for recovery and reconstruction planning and implementation, a PDNA is normally undertaken after the emergency phase or during the time when the post-disaster emergency operations are winding down and longer-term recovery is about to start.

The following are the important features of a PDNA:

- It should be led and undertaken by the government after a disaster with the collaboration of international development partners and even the private sector.
- PDNA is intended to identify and/or estimate:
 - Damages caused by a disaster to physical infrastructure and the losses (changes in economic flows) in the various sectors of the economy, including an assessment of its macro-economic impacts or consequences as well as changes in the social or human development indicators.

- Define the framework, strategies and financial requirements of programs and projects to achieve overall post-disaster recovery, reconstruction and risk management.
- The sectors assessed in a PDNA are those contained in the national accounting system such as agriculture, industry, trade and services etc. and the corresponding sub-sectors under them.
- Various experts like engineers, economists, finance specialists, statisticians, etc. who have knowledge on the valuation and estimation of damages, losses and needs in a certain sector should be members of the assessment team for that given sector.

The **Department of Economics & Statistics** will support the HPSDMA in conducting the PDNA in case of any disaster occurrence of large magnitude. Therefore, the department shall actively create a database of trained personnel of the department in PDNA from NIDM, NDMA & UNDP. This will help in early recovery & rehabilitation in post disaster scenarios. The department shall coordinate with the HPSDMA and DDMA's for these trainings. The Incident Response Teams at Districts as well as at the State Level will get strengthened by this pool of trained PDNA officers as the PDNA will help in assessing:

- Total value of destroyed physical assets (damages) and of changes in the flows of production of goods and services (financial losses);
- Ownership of the above, whether public or private in nature;
- Identification of most affected sectors;
- Spatial or geographical distribution of disaster effects;
- Impact of disaster at macro-economic, sectorial, personal/household levels (social impacts) and cross-cutting issues/concerns;
- Estimation of post-disaster needs for recovery, reconstruction and other cross-cutting issues like disaster risk reduction measures, environment, etc.; and
- Suggested framework and strategies in implementing the recovery and reconstruction activities.

7 DISASTER RECOVERY AND RECONSTRUCTION

7.1 DISASTER RECOVERY

When a disaster event occurs, the first priority is to save lives, treat the injured people, provide access to basic services, and conduct urgent short-term repairs. These essential activities are conducted during the disaster relief phase. After the disaster relief phase, many countries around the world have found significant value to conduct a post-disaster assessment of socio-economic and environmental effects within the disaster-affected area. The assessment, which normally includes estimation of physical damage and economic losses across development sectors and all the related social impacts, helps ensure that reconstruction and recovery needs are identified, analyzed, and prioritized. A comprehensive assessment is therefore the foundation for subsequent reconstruction and recovery activities in the affected area.

The process of recovery from small-scale disasters is usually simple. Recovery operations get completed almost simultaneously with the response, relief and rehabilitation. However, in medium and large disasters involving widespread damages to lives, livelihoods, houses and infrastructure, the process of recovery may take considerable time as the relief camps continue till houses are reconstructed. Often intermediary shelters have to be arranged before the permanent settlements are developed.

Financial requirements for recovery must be estimated as a function of the values of destroyed assets, of the changes in the flows of the economy, and of the decline in personal or household income, as arising from the assessment of disaster effects. The needs for recovery in the productive sectors – agriculture, manufacturing, trade, mining and tourism – are represented by the amounts of working capital required by producers to achieve recovery of production levels. The needs for recovery in services sectors – education, health, culture, transport and communications, electricity and water and sanitation – are the amounts required to restore supply to, and access by, the population.

The estimation of personal or household income decline, arising from the previously estimated drop in production at sectorial levels, is used to determine the possible financial requirements for “cash-for-work” and other income-assistance programs for the affected population. Reconstruction requirements are estimated through the estimation of the value of destroyed physical, durable assets duly supplemented to incorporate an additional cost for improved, disaster-resilient standards.

7.2 DISASTER RECONSTRUCTION

Post-disaster construction provides an opportunity for ‘Building Back Better’ so that the reconstructed assets are able to withstand similar or worse disasters in future. It is difficult to anticipate such reconstructions as these would depend on the types and location of the disasters and the nature reconstructions to be made, which would be known only after the disasters.

7.3 ACTION PLAN FOR RECONSTRUCTION

Reconstruction is time and funds absorbing phase of disaster management. The construction department will be persuaded to include disaster resilient features in new constructions. Reconstruction programmes will be within the confines and the specification as laid down by the by the government known as National Building Codes. The work of the new construction will be completed in a long time. Hospitals are to run in shelter accommodation by the time new construction is complete. Essential services in shelters/camps will be established in the shortest possible time.

7.4 FINANCIAL MECHANISM

It is very difficult to estimate the budget requirement for relief and rehabilitation phase of disaster management. Funds required for this head will depend upon nature and intensity of natural calamity. However, the budgetary requirement can be reduced considerably by addressing structural and non-structural mitigation measures.

Disasters that negatively affect living conditions of the population and slow down overall socio-economic development arise from the combined action of natural phenomena of extraordinary magnitude and the existing vulnerabilities of human settlements and the environment. Such disasters produce the destruction of capital and physical assets, generate interruption and decline in the production of goods and services, and slow down human development.

Estimation of disaster impact at different levels of analysis:

- Macro-economic impact analysis, including impact on growth of gross domestic product (GDP), external sector, and fiscal sector, nationally, as well at the level of states;
- Personal or household impact analysis, including impact on employment, income and expenditure leading to estimation of disaster impact on human development and on the achievement of Millennium Development Goals (MDGs).

Estimation of post-disaster financial requirements or needs for: - Recovery of personal income, access and provision of basic services, and of normal production levels of activity; - Reconstruction of destroyed assets including introduction of disaster risk reduction measures.

8 FINANCIAL ARRANGEMENTS

Section 40(2) of the Disaster Management Act stipulates that every department of the State Department while preparing the DM Plan shall make provisions for financing the activities proposed therein. Normally the funds required for risk assessment and disaster preparedness must be provided in the budgets of every concerned department. Such funds are not very sizeable and Department of Health and Family Welfare will allocate such funds within their normal budgetary allocations from coming budget year for risk assessment and preparedness. Although, the department has been directly incurring funds on construction of new and maintenance of old hospital buildings where the mainstreaming of DRR is essential.

The marginal costs involved in mainstreaming disaster risk reduction in existing programmes, activities and projects of the departments are also not very sizable and the departments may not find it difficult to arrange such funds. YSS department plans will ensure in the existing schemes and future activities to make hospital buildings safer and disaster resilient.

As per the guidelines issued by the Ministry of Finance, Government of India vide Memo No.55(5)/PF-II/2011 dated 06/01/2014 for 10% flexi-funds within the Centrally Sponsored Schemes (CSS) to be utilized, inter-alia, for disaster mitigation, restoration and innovation activities in the event of natural disasters. The Elementary education department has the scope of using the flexi funds from the CSS like National Rural Health Mission (NRHM) by proper planning and utilization for disaster mitigation which can help to some extent in reducing the risk/vulnerability due to natural disasters to which the state of Himachal Pradesh is highly prone to.

8.1 PROVISION OF FUNDS

There is a need for funds to strengthen the existing facilities both at State level as well as District level under the caption “Disaster preparedness” which is not available with the department. Hence, in the annual budget plan for the Department, a mitigation fund needs to be created. By these funds the officers can be trained in PDNA and other relevant DRR techniques. Department of revenue has suggested keeping 10 percent of all development plan for non-plan budget disaster management issues.

I. DISASTER STATISTICS 2007-2015

The data collection work of Disaster Statistics started from 2007 in all 12 districts of Himachal Pradesh. The present report provide district wise and year wise results based on data collected from 2007-15.

- During the year 2007-15 the maximum live lost were 2030 during the year 2009-10.
- The maximum Livestock loss occurred in 2013-14, in district Kinnaur which was 12,246.
- The maximum number of tree uprooted were 3,43,738 during the year 2012-13. In Mandi district Maximum number of tree uprooted were 1,67,800.
- A total number of 15,817 Kacha house were damaged in rural area during the year 2008-09.
- A total number of 2174 Pacca house damaged in rural area during the year 2013-14.
- The maximum high tension line damaged 1358 kilometer during the year 2013-14 and low tension line damaged 1289 kilometer in the year 2012-13
- An Assistance of Rs.55 Lakh was provided for Primary Education during the year 2012-13.
- The loss of sown area affected due to disaster was 317222, hectare in the year 2009-10.
- The area affected in Horticulture crops were about 154788 Hectare during the year 2014-15.
- The production loss in Horticulture crops was about 3,72,125 ton out of which 2,021,59 (54.33%) loss in district Shimla.
- The maximum amount spent on fully damaged house was 3431 lakhs in the year 2014-15.
- The number of village disconnected with transportation facility were 836 in the year 2013-14.
- The data shows that total 228 days some villages were disconnected with transportation facility in the year 2014-15.
- The maximum number of Soil works damaged were 2702 number during the year 2013-14.
- The amount of Rs. 257 lakh assistance was provided for soil works damaged during the year 2013-14.
- An amount of Rs.106 lakh. assistance was provided for forest building damaged during the year 2012-13.
- An amount of Rs. 25 lakh assistance was provided for provision of fodder in cattle camps.
- An amount of Rs. 39 lakh assistance was provided for vaccine and medicine for animals during the year 2012-13.
- 508 Primary School were damaged during the year 2013-14.
- 11 Dispensaries were damaged in 2012-13.
- 6 PHC's were damaged during the year 2012-13 and 2013-14.
- The maximum number of land line telephone disrupted were 150 days in the year 2014-15.

- The Maximum number of mobile phone disrupted for 120 days in the year 2012-13.
- The maximum of 134 other commercial building were damaged during the year 2012-13.
- Rs. 243 lakh were provided for gratuitous relief during the grievous injury requiring hospitalization during the year 2014-15.
- The assistance of Rs. 1379 lakh were provided during the year 2013-14 for the relief of Old , Infirm, Destitute children.
- The maximum assistance of Rs. 54 lakh were provided for the clothing, utensils/households goods for affected families during the year 2012-13.
- An amount of Rs. 6788 lakh assistance was provided for repair and restoration of damaged road and bridges during the year 2010-11
- Rs. 203 lakh were provided for damaged electricity transformer.
- An amount of Rs. 1694 lakh assistance was provided for supply of drinking water in rural and urban area
- An amount of Rs. 239 lakh assistance was provided for damaged soil works.

II. Important Telephone Numbers

III. Format for First Information Report on Occurrence of Natural Calamity

(To be sent to SEOC and NEOC, Government of India within maximum of 24 hours of occurrence of calamity)

From: District/State ----- Date of Report -----

To

i) The Relief Commissioner cum Principal Secretary Revenue (Fax: _____ email: ___)

ii) JS (DM), MHA (fax : _____ ; email : _____)

iii) I/c National Integrated Operations Centre, MHA (fax: _____; email:_____)

- a. Nature of Calamity
- b. Date and time of occurrence
- c. Affected area (number and names of affected districts)
- d. Population affected (approx.)
- e. Number of Persons
 - i. Dead
 - ii. Missing
 - iii. Injured
 - iv.
- f. Population affected (approx.)
- g. Affected
- h. Lost
- i. Crops affected and area (approx.)
- j. Number of houses damaged
- k. Damage to public property
- l. Relief measures undertaken in brief
- m. Immediate response and relief assistance required and the best logistical means of delivering that relief from State/National
- n. Forecast of possible future developments including new risks.

IV. Any other relevant information