



DISASTER MANAGEMENT PLAN

DEPARTMENT OF AGRICULTURE

GOVERNMENT OF HIMACHAL PRADESH

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1. INTRODUCTION

1.1 OVERVIEW OF THE DEPARTMENT

The Department of Agriculture was established in the year of 1952. In the early years, the Department had to cater to the needs of both agriculture research and extension, in respect of agriculture and horticulture crops. In 1970, the horticulture wing of the department was separated and a separate horticulture department was established to look after the needs of horticulturists in the State. In 1971, Government entrusted the work of research to Agriculture University.

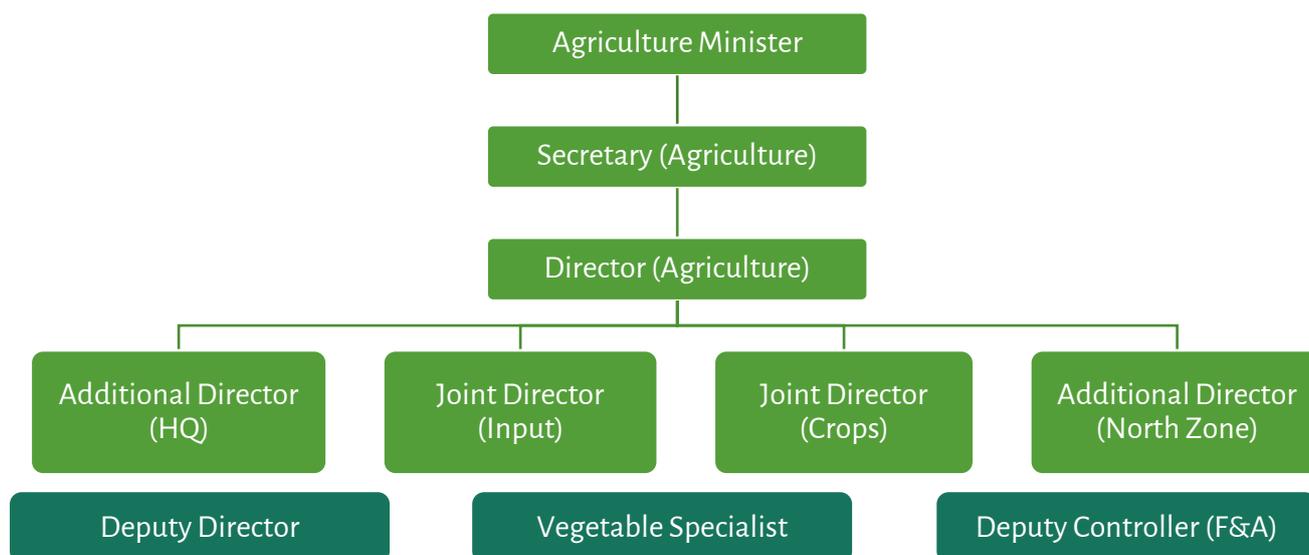
1.1.1 THE MANDATE OF THE DEPARTMENT

- To provide support to the farming community in terms of farm advisory services, new farm technology for enhancing agriculture production.
- To increase production, productivity and farm income.
- To promote diversification for higher farm income and efficient marketing.
- To promote sustainable agriculture through the management of natural resources and soil health, organic and risk mitigation.
- To provide research and development support to develop human resources and increased growth in agriculture.
- To ensure the uninterrupted functioning of all infrastructures related to agriculture sector.
- To support soil and water conservation on agriculture lands.
- To harness the Agro-ecological potential through diversification of crops encouraging adoption of cash crops.
- To provide logistic support to the farmers in the form of supply of quality agriculture inputs like seeds, fertilizers, plant protection material, implements etc.

1.1.2 GOALS OF AGRICULTURE DEPARTMENT

- Transfer of technology for increased production and productivity through demonstrations, training and exposure visits.
- Ensuring an adequate and timely supply of agriculture inputs and their quality control.
- Production of seeds of high yielding varieties of the crop to achieve higher seed replacement rate and higher productivity.
- Promotion and popularisation of latest technologies like IPM, INM, organic farming etc.
- Increase area under high-value crops through diversification process.
- Promotion of new farm implements and machinery including gender-friendly tools.
- Conservation and management of natural resources through protection of agriculture lands, water harvesting, watershed management and micro-irrigation.
- Insurance of crops against natural calamities through the implementation of NAIS and WBCIS.
- Create and strengthen marketing facilities through agriculture produce marketing committees/ H.P Marketing Board.
- SAU's to develop human resources and technologies.

1.1.3 ORGANIZATIONAL STRUCTURE



The Department of Agriculture is headed by the Director of Agriculture with headquarter at Shimla. The Director of Agriculture is assisted by two Joint Directors of Agriculture. One Additional Director of Agriculture has been posted for North Zone at Dharamsala, in Kangra District, who is responsible for direction, administration and monitoring of all the activities in Kangra, Chamba, Una, Hamirpur and Mandi districts with regard to the agriculture department.

In 10 districts (except Lahaul & Spiti and Kinnaur) Deputy Director Agriculture is responsible for the implementation of all Agriculture Development Programmes. Whereas in Lahaul valley and District Kinnaur, District Agricultural Officer with headquarter at Keylong and Reckongpeo respectively and in Spiti Division, Assistant Project Officer (Agr.) with headquarter at Kaza are responsible for implementation of Agriculture Development Programmes. The Deputy Director of Agriculture in the district is assisted by the District Agricultural Officer, Regional Potato Development Officer and Subject Matter Specialists. With a view to strengthening the extension network at grass root level, one SMS (Subject Matter Specialist), two ADOs (Agri. Dev. Officer) and 4 to 6 AEOs (Agri. Ext. Officer) have been provided in each block.

To carry out Soil & Water Conservation and minor irrigation activities, 21 Sub Divisions are in existence and each Sub-Division is headed by the Sub Divisional Soil Conservation Officers who are working under the

control of respective Deputy Director of Agriculture. For technical support three Soil Conservation Divisions have been established at Shimla, Mandi at Bhangrotu and Kangra at Palampur however, their administrative and financial control is the Deputy Director of Agriculture of the District.

One Agriculture Extension Training Centre upgraded as State Agriculture Management

Extension & Training Institute(SAMETI) at Mashobra & one Farmers Training Centre at Sundernagar headed by Director and Principal respectively have been set up to cater to the needs of training capacity building of the grass root extension functionaries viz. Agriculture Dev. Officers, Agriculture Extension Officers and farmers.

Soil testing laboratories headed by Soil Testing Officers in each district (except Lahaul-Spiti) have been set up where soil samples are tested and accordingly soil management practices are suggested to the farmers.

1.2 PURPOSE OF THE PLAN

Every department of the State Government is legally mandated under Section 40 of Disaster Management Act 2005 to prepare its disaster management plan in accordance with the guidelines laid down by the State Disaster Management Authority. The Act stipulates that while preparing the plan, every Department shall make provisions for financing the activities specified therein¹. The plan shall be reviewed and updated annually² and a report on the status of implementation of the plan must be furnished to the State Executive Committee.³

The overall aim of this plan is to make the farming community resilient enough to deal with any unlikely events. The plan will also provide guidance to attached and subordinate offices as well as other agencies within the Agriculture Department to manage the risks of disasters before, during and after a disaster.

The objectives of this plan are to facilitate the Agriculture Department in the following:

- (i) Assessment of the sectoral and departmental risks of disasters in Agriculture Department;
- (ii) Undertaking measures for mitigating the existing risks of disasters to agriculture sector;
- (iii) Prevention of creation of new risks of disasters in agriculture sector in the state;
- (iv) Undertaking preparedness measure;
- (v) Assigning role and responsibilities for various tasks to be performed by the department in accordance with the State DM Policy and State DM Plan;
- (vi) Undertaking measures proposed for strengthening capacity-building and preparedness of farmers and other stakeholders of agriculture sector;
- (vii) Mounting prompt and coordinated response at various levels.

1.3 SCOPE OF THE PLAN

Department of Agriculture has the primary responsibility to manage drought. However, the agriculture sector is also affected by floods, cloudburst, hailstorms and windstorm. Hence, in accordance with the Disaster Management Act 2005 and Himachal Pradesh Disaster

¹ Section 40(2)

² Section 40(1)(b)

³ Section 40(3)

Management Plan 2012, the scope of this plan is to plan and prepare for all hazards having bearing on agriculture.

Agriculture is the main occupation of the people of Himachal Pradesh has an important role in the economy of the state. It provides direct employment to about 69% of the main working population. Income from the agriculture and allied sector account for nearly 20.0% of the total State Domestic Product, therefore, the scope of the plan should include all the stakeholders.

Some of the key functions the Agriculture Department is expected to discharge to strengthen the resilience of agriculture and the farming community in the state are as under:

- Identify hazards and analyse risks to the vulnerable farming lands and community of the state to different natural as well as man-made hazards.
- Undertake measures for prevention and mitigation of disasters impacting agriculture in the state.
- Integrate disaster mitigation measures in all the central and state-sponsored schemes and programmes being implemented by the Department of Agriculture.
- Undertake awareness and capacity building measures for the farming community and staff members.
- Assign roles and responsibilities of each agency in relation to pre-during-post disaster phases.

1.4 AUTHORITIES, CODES AND POLICIES

Functioning of Disaster Management in Himachal Pradesh is governed as per the Disaster Management Act 2005 and Himachal Pradesh Disaster Management Plan 2012. Apart from that, various policies and schemes funded by state and central both also contain disaster risk mitigation measures. As per Section 23 of the DM Act 2005, there shall be a DM plan for every state and within the state, there must be departmental plans for the concerned agencies to deal with disastrous situation smoothly. It provides for the departments of the state governments to draw up their own plans in accordance with the state plan. It also provides for annual review and updating of the departmental plan every year and enjoins upon the state governments to make provisions for financing the activities to be carried out under the departmental plans.

Apart from that, there is guideline and provision for State Disaster Response Fund (SDRF) and National Disaster Response Fund (NDRF) which can be claimed by the departments at any stage of the disaster management.

Department of Agriculture will be guided by the following:

- (i) Disaster Management Act 2005
- (ii) Himachal Pradesh Disaster Management Plan 2012
- (iii) Himachal Pradesh Disaster Management policy
- (iv) National Disaster Management Plan 2016
- (v) National Guidelines issued by the NDMA
- (vi) Guidelines and provision for State Disaster Response Fund (SDRF)
- (vii) Guidelines for administration of the National Disaster Response Fund (NDRF).

1.5 INSTITUTIONAL ARRANGEMENTS FOR DISASTER MANAGEMENT

- As per the 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
- 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 on 1st June 2007 which comprise Secretary (Agriculture) as one of the members.
- As per Section 25 of the DM Act 2005, District Disaster Management Authority has also been constituted in every district of Himachal Pradesh Advisory Committee where Agriculture Department is represented
- Nodal Officer for DM in the Department.

Agriculture Department's roles and responsibilities as Primary and Support Agency:

| # | Hazards | Nodal department | Supporting agencies / departments / for early warning system |
|---|-------------|------------------------------|---|
| 1 | Drought | Agriculture | IMD, Revenue, Rural Development, DRDA, Nauni and Palampur University, Horticulture, S&T |
| 2 | Hailstorm | Agriculture and Horticulture | IMD, Home and Insurance |
| 3 | Wind Storms | Revenue | IMD, Agriculture and Horticulture, Home |
| 4 | Pest Attack | Agriculture and Horticulture | Home, Revenue and NDRF |

Agriculture Department has been assigned the following:

- To announce and disseminate Early Warning of the Drought and Hailstorms
- To act as nodal department for drought-related disasters.
- To undertake need & damage assessment with respect to agricultural crops of all types.
- To be the Primary Agency for hailstorms, droughts and pest attacks.
- To provide seeds and necessary planting material and other inputs to assist in early recovery.
- To assist the farming community in restoration & relocation efforts in non-disaster time.

1.6 PLAN MANAGEMENT (MONITORING, REVIEW AND REVISION)

Implementation of the Plan

Directorate of Agriculture shall be responsible for implementation of the Plan. The Nodal Officer shall coordinate with all stakeholders for implementing the Plan. Annual Progress on implementation of the Plan will be submitted to HPSDMA.

Revision of the Plan

The Disaster Management Plan is a living document. As per it will be revised on annual basis as per provisions of the DM Act-2005. Any changes in guidelines under the NDRF and SDRF shall be incorporated in the plan as and when such changes are made. The introduction of new technology for hazard risk mitigation shall also be incorporated as when the same is tested and found feasible and acceptable in particular geographical area of the State.

System of Updation

The Plan shall be updated by the Directorate of Agriculture with the help of State Disaster Management Authority at least once in a year or as and when felt necessary. Consultations will be held with the stakeholders for making changes in the Plan. The Nodal Officer shall be responsible for holding consultations and updating the Plan.

Dissemination of Plan

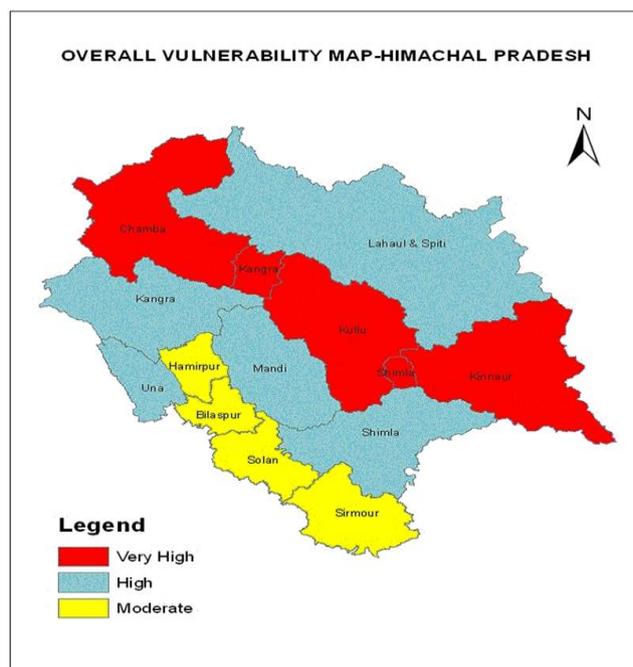
After finalisation of the plan, a copy will be submitted to the HPSDMA for approval. After approval, it shall be disseminated to all agencies, field offices and other stakeholders. Further, whenever it revised/updated, it shall be submitted to HPSDMA for endorsement of changes. The revised Plan shall be shared with all concerned.

2. HAZARD, RISK AND VULNERABILITY ANALYSIS

2.1 RISK ASSESSMENT OF HIMACHAL PRADESH

Hazard Profile of the State

Himachal Pradesh is a mountainous state situated in the western Himalayas with an elevation ranging from 350 meters to 6000 meters. Thus, there is a great variation in the geo-climatic conditions of the state due to the extreme variation in the elevation. The climate varies from hot and sub-humid tropical in the southern tracts to cold, alpine and glacial in the northern and eastern mountain ranges with increasing elevation. These conditions make the state prone to various hazards both natural and manmade. Main hazards consist of earthquakes, landslides, flash floods, snowstorms and avalanches, droughts, dam failures, fires – domestic and wild, accidents – road, rail, air, stampedes, boat capsizing, biological, industrial and hazardous chemicals etc.



The districts of Chamba, Kinnaur Kullu and part of Kangra and Shimla fall in very high vulnerable risk. Similarly, districts of Kangra, Mandi, Una, Shimla and Lahaul and Spiti fall in high vulnerable risk status. The district Hamirpur, Bilaspur, Solan and Sirmour falls in moderately vulnerable risk status. The disaster management strategies and infrastructure required to be evolved by taking the factor of vulnerability into consideration.

| # | Nature of Disaster | Frequency | Intensity |
|----|---------------------|-----------------|-----------------------|
| 1 | Flood / Flash Flood | Regular Frame | High |
| 2 | Drought | Every 3-5 Years | Moderate |
| 3 | Cloud Bursts | Regular Feature | High |
| 4 | Earthquake | Regular Feature | Moderate to Very High |
| 5 | Landslides | Regular Feature | High |
| 6 | Avalanches | Regular Feature | Low |
| 7 | Lightening | Rare | Low |
| 8 | Disease Epidemics | Rare | Low |
| 9 | Fire | Regular Feature | High |
| 10 | Pest attack | Regular | High |
| 11 | Hailstorm | Regular | High |

As far as the agriculture department is concerned drought, flood, GLOF, pest attack, hail storms are the major hazards that would affect the department as well as the entire sector per se. Along with the above-mentioned hazards, the assets of the department can also be affected by earthquake and landslides. Therefore, the department should assess the risk of its own assets to various hazards.

2.2 ASSESSMENT OF SECTORAL AND DEPARTMENTAL RISKS

The sectoral risks of disasters consist of the risks for the entire sector that the department represents. Agriculture provides direct employment to about 69 percent of the main working population, while agriculture and allied sectors account for only 22.1 percent of the total State Domestic Product. Out of the total geographical area of 55,673 sqm. km (55.7 lakh hectare) area of operational holding is about 9.79 lakh hectares owned by 9.14 lakh farmers. The marginal and small farmers possess 86.4 percent of the total land holdings. The reported net sown area in the state is only 10.4 percent. The departmental risks of disasters consist of the risks arising out of the exposure of vulnerable departmental assets to the natural or manmade hazards.

Sectoral Risk to the Department Of Agriculture

2.2.1 DROUGHT RISK

- Himachal Pradesh's cash economy is dominated by agriculture and horticulture. Due to mountainous situation and domination of marginal and small holdings, cereal crops are grown mostly to meet the self-consumption needs by more than 75% of the households. The results of HRVA report of TARU shows that the once in 10-year rainfall can be significantly lower than the median rainfall. Nearly half the state gets less than 1200 mm of annual median rainfall. Given the high slopes and skeletal soils, the moisture retention is likely to be low and regular and frequent rainfall is required for water-demanding crops.
- The HRVA report also indicates that almost all parts of the state except region around Shimla face medium to high drought risks in monsoon rainfall. Shiwalik region of Hamirpur faces summer water shortages due to lack of any perennial sources. Since the soils in Hamirpur and Sandy and shallow, the meteorological droughts can translate into agricultural droughts. In the high-risk zone, the once in 10-year drought may be nearly two-third of the median monsoon rainfall, which can cause severe distress to the rainfed crops.
- The total losses under 1-4 D (Deciles), as well as normal production, is presented in the following table. This table data is the maximum loss if the whole state faces 1D crop loss situation, which is not generally possible and should be taken as a theoretical maximum loss only.

| Crop | Normal area ('000 ha) | Loss (in '000 MT) | | | | Normal production (in '000 MT) |
|----------------|-----------------------|-------------------|-----|----|----|--------------------------------|
| | | 1D | 2D | 3D | 4D | |
| Rice | 82 | 14 | 9 | 6 | 3 | 121 |
| Wheat | 375 | 175 | 103 | 58 | 27 | 517 |
| Maize | 318 | 146 | 75 | 33 | 13 | 722 |
| Barley | 25 | 8 | 6 | 3 | 1 | 29 |
| Rape & Mustard | 11 | 2 | 1 | 1 | 0 | 5 |
| Potato | 13 | 33 | 25 | 17 | 9 | 118 |

Source: Agricultural department data; TARU Analysis 2014

The financial losses assessed from the crop volume losses are as follows:

| Crop | Loss | | | | Normal Production |
|------------------------|---------------|---------------|---------------|--------------|-------------------|
| | 1D | 2D | 3D | 4D | |
| Barley | 970 | 670 | 372 | 132 | 3,421 |
| Maize | 20,395 | 10,532 | 4,601 | 1,870 | 1,01,019 |
| Potato | 4,964 | 3,777 | 2,568 | 1,387 | 17,673 |
| Rape & Mustard | 766 | 505 | 312 | 150 | 1,804 |
| Rice | 2,852 | 1,865 | 1,282 | 673 | 24,146 |
| Wheat | 26,245 | 15,511 | 8,740 | 4,030 | 77,601 |
| Total | 56,194 | 32,860 | 17,874 | 8,241 | 2,25,665 |
| Percentage loss | 25% | 15% | 8% | 4% | - |

Source: Agricultural department data; TARU Analysis 2014

2.2.2 GLACIAL LAKE OUTBURST FLOOD (GLOF)

- The possibility for a GLOF to occur sometime in the future cannot be dismissed, particularly in view of continued atmospheric warming and the associated increase in the volume of glacial lakes. Furthermore, expansion of infrastructure in the vulnerable sectors downstream means that the actual risk associated with an individual event is increasing.
- It has been observed that glacial lake outburst floods have cascading effect on life, livelihood and infrastructure. In the state of HP, the local economy and state gross domestic product (GDP) is highly dependent on horticulture production. This activity is in turn dependent on the glacial ice melt and snowmelt during summers. Changes in the glaciers or resultant GLOF may have an impact on the regional economy.

2.2.3 RIVERINE FLOODING

- The amount of flooding is a function of the amount of precipitation in an area, the amount of time it takes for rainfall to accumulate, previous saturation of local soils, and the terrain around the river system. The State HRVA study about the riverine flood shows that about 59 villages in Beas basin and 280 villages in Sutlej basin are potentially at risk due to inundation caused by river flooding.

2.2.4 CLIMATE CHANGE

Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically many decades or longer). Climate change may be due to natural internal processes or external forcing, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. The long-term trends in observed seasonal precipitation and temperature over Himachal Pradesh using IMD gridded rainfall and temperature at daily time scales has been performed to arrive at current baseline climatology for the state. IMD gridded data was used for Climate change hazard risk analysis.

Observed Temperature and Precipitation

Summary of the long-term trends in observed seasonal precipitation and temperature over Himachal Pradesh using IMD gridded rainfall and temperature at daily time scales is:

2.2.4.1 RAINFALL

- Annual average rainfall for Himachal Pradesh from 1971-2005 (35 years) is 1294.3 mm. The mean south-west monsoon (June, July, August and September) rainfall (802 mm) contributes 62% of annual rainfall. Contribution of pre-monsoon (March, April and May) rainfall and post-monsoon (October, November and December) rainfall in annual rainfall is 17.8% and 13.6% respectively.
- Annual average rainfall for the state shows a significant positive trend in period 1971-1990 while the insignificant negative trend in 1991-2005.
- Maximum mean observed monsoon rainfall is observed in North Western districts of the state namely, Chamba, Kangra, Sirmour and Hamirpur districts for both the periods (1971-1990 and 1991-2005). Lahul & Spiti receives the least rainfall.

2.2.4.2 RAINY DAYS

- An average number of rainy days in Himachal Pradesh during the south-west monsoon is about 50 days for the period 1969-2005 and varies from 25 days to 69 days.
- An average number of rainy days in the state during the post-monsoon (winter) is about 7 days and varies from 3 days to 9 days.
- An average number of rainy days (when daily rain >2.5 mm) in the state during the south-west monsoon is about:
 - 43 days and varies from 17 days to 71 days for 1971-1990.
 - 45 days and varies from 17 days to 78 days for 1991-2005.
- In monsoon months in period 1991-2005, light to rather heavy rainfall days ($0 < R \leq 64.4$ mm) have increased by 3 days on average compared to 1971-1990 while the extreme and heavy rainfall days show no change.

2.2.4.3 TEMPERATURE

- Annual average maximum and minimum temperature for Himachal Pradesh from 1969-2005 are 25.2°C and 13.0°C respectively. Seasonal average maximum temperature is higher during monsoon season (30.0°C) and ranges between 28.6°C to 31.6°C. Similarly, the seasonal average minimum temperature is lowest during the winter period (4.4°C) and ranges from 1.9°C to 6.1°C.
- The annual maximum temperature for Himachal Pradesh shows an increase of about 0.41°C in 1991-2005 while in 1971-1990 it shows no change. In pre-monsoon season, state maximum temperature show decline of about 1.63°C in 1971-1990 while the increase of about 2.07°C in 1991-2005.
- The annual minimum temperature for Himachal Pradesh shows an increase of about 0.19°C in 1991-2005 while in 1971-1990 it shows a much higher increase of about 3.6°C. State shows much higher increase in minimum temperature in pre-monsoon, monsoon and post-monsoon seasons in 1991-2005 in comparison to 1971-1990

2.2.5 CLIMATE CHANGE TEMPERATURE AND PRECIPITATION

PRECIS simulations for future indicate an all-around warming over Himachal Pradesh associated with increasing greenhouse gas concentrations.

- The mean minimum and maximum air temperature rise by mid-century is projected to be around 2.3°C and 1.9°C respectively. Change for the same towards end century is projected to be around 5.0°C and 4.6°C respectively. The increase in minimum temperature is projected to be marginally higher than the maximum temperature.
- Precipitation is projected to increase by about 15% and 28% towards mid-century and end Century respectively.

2.2.6 CLIMATE INDICES

Climate extremes show that minimum of maximum and minimum of minimum temperatures is consistently increasing in Mid-Century (MC) and End Century (EC) compared to the Base Line (BL), indicating significant warming up increasing over the Himachal Pradesh districts. Very wet and extremely wet day precipitation is projected to increase for all the districts in Mid Century and End Century compared to the BL implying that rainfall and its intensity would increase in the future.

- Percentage of warm days and warm nights is projected to increase while the percentage of cool days and cool nights is projected to decrease for all the districts implying warming up.
- Kullu, Kinnaur and Mandi districts of Himachal Pradesh are expected to get the warmest in MC and EC compared to the BL, while for Lahul & Spiti temperature increase is expected to be the least compared to the other districts.
- Increase in precipitation in MC and EC is projected to be the maximum for Salon, Bilaspur, Hamirpur districts of Himachal Pradesh compared to the BL, while increase in extremely wet days (annual total rain when rainfall is greater than 99th percentile of baseline) is projected to be the maximum for Mandi, Hamirpur and Bilaspur districts.
- Increase in count of very heavy precipitation days is expected to be the maximum for Salon, Bilaspur and Kangra of Himachal Pradesh districts compared to the baseline
- 1 and 5-day extreme precipitation increase is projected to be the maximum for Shimla towards end century

The sectoral risks of disasters consist of the risks for the entire sector that the department represents. For example, the Agriculture Department may assess the potential risks of the total production from the state due to the increasing number of hazards like flash floods or landslides in any specific region. The flash floods, in particular, have increased their frequency at the places situated near the river like Kullu. The departmental risks of disasters consist of the risks arising out of the exposure of vulnerable departmental assets to the natural or manmade hazards.

2.2.7 THE RISK TO ASSETS / INFRASTRUCTURE OF AGRICULTURE DEPARTMENT

The assets of Agriculture department include the following infrastructure:

| Assets / infrastructure at Risk | Hazard | Likely Impact | Details of assets |
|---|------------------------------|---|-----------------------|
| Deputy Director offices | Earthquake, Landslide | Partial or complete damage to the building, equipment's loss of important documents | Number of offices- 10 |
| District Agricultural officer office | Earthquake, Landslide, Flood | Partial or complete damage to the building, equipment's loss of important documents | Number of offices- 2 |
| Project Director Offices | Earthquake, Landslide, Flood | Partial or complete damage to the building, equipment's loss of important documents | Number of offices-2 |
| Agriculture Produce Market Committees (APMC) | Earthquake, Landslide, Flood | Partial or complete damage to the building | Number of offices- 10 |
| Market yards and sub-market yards | Earthquake, Landslide, Flood | Partial or complete damage to the building | Number of offices- 45 |
| Divisional Engineer offices | Earthquake, Landslide, Flood | Partial or complete damage to the building | Number of offices- 3 |
| Soil Conservation subdivision | Earthquake, Landslide, Flood | Partial or complete damage to the building, equipment's loss of important documents | Number of offices- 21 |
| Farmer training centers | Earthquake, Landslide, Flood | Partial or complete damage to the building | Number of offices- 2 |
| Himachal Pradesh Agricultural Marketing Board | Earthquake, Landslide, Flood | Partial or complete damage to the building | Number of offices- 1 |
| Seed testing labs | Earthquake, Landslide, Flood | Partial or complete damage to the building, equipment's loss of important documents | Number of offices- 3 |

Other than the above-mentioned information all the administrative related setups have their own buildings. As informed by the department, many buildings lie in different hazard-prone areas of earthquake and are also prone to fire but any kind of safety audit/ risk audit or retrofitting per se has never been done. Although there is a separate fund which comes every year for the maintenance of the assets of the department that is not sufficient to maintain the large number of assets that the department possess.

The risk which these assets of the department have during the time of a disaster is to be considered by the department itself, and it should try to get ready for disaster with the help of various mitigation strategies. Further, Department like that of Agriculture should assess the potential risks of disasters due to emerging issues like climate change.

2.3 ASSESSMENT OF CAPACITY GAPS AND NEEDS

The department is having almost 40 percent vacant post, which is not being filled because of the lack of available fund. This affects the working capacity of the department. With more human resource being deployed within the department, the overall capacity of the department can be increased.

Department is having some mobile testing labs but they have no assigned drivers for the same. Because of which the very purpose of having a mobile van with the help of farmers is not being served sometimes.

Although the department of agriculture provides seeds to the farmers in the best suitable way. But sometimes they are not able to provide a certain variety which the farmers ask because the department cannot provide seeds to the farmers until and unless they are tested by the agriculture university, which at times is inconvenient for the farmers.

Prime Minister's flagship soil testing program is also been implemented in the state, but the number of testing labs is not sufficient to do the entire process.

2.4 ASSESSMENT OF PROBABLE DAMAGE AND LOSS

The department assessment of the damage may provide details of loss suffered by the sector per se. The table below shows that due to natural disasters around 3, 17,222 hectares of sown land was affected in 2009-10 which resulted in the food crop production loss of 1,72,316 tones. The amount of loss shows that there is an urgent need to start implementing the idea of risk reduction in the policy-making of the sector.

Loss of sown area (hectares) due to various disasters

| # | District | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012 - 13 | 2013 - 14 | 2014 - 15 |
|----|----------|---------------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|
| 1 | BILASPUR | 19993 | 54986 | 51350 | 23150 | 5700 | 4652 | 1200 | 4285 |
| 2 | CHAMBA | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 13120 |
| 3 | HAMIRPUR | 35200 | 35867 | 9417 | 18080 | 11798 | 10070 | 4284 | 4191 |
| 4 | KANGRA | 13076 | 38531 | 143704 | 11950 | 0 | 0 | 0 | 0 |
| 5 | KINNAUR | 46 | 9 | 0 | 0 | 0 | 0 | 1386 | 110 |
| 6 | KULLU | 2550 | 29630 | 43850 | 43836 | 24468 | 2140 | 790 | 0 |
| 7 | L&S | 0 | 0 | 0 | 0 | 2 | 8 | 0 | 0 |
| 8 | MANDI | 19690 | 40415 | 57143 | 40137 | 19942 | 24669 | 24750 | 3240 |
| 9 | SHIMLA | 9216 | 0 | 2058 | 0 | 31 | 2039 | 16 | 100 |
| 10 | SIRMOUR | 34 | 64 | 5699 | 4793 | 35 | 353 | 8 | 14662 |
| 11 | SOLAN | 3051 | 3302 | 4001 | 932 | 2 | 0 | 2457 | 1500 |
| 12 | UNA | 3837 | 58617 | 0 | 0 | 0 | 6 | 225 | 7 |
| HP | | 106693 | 261422 | 317222 | 142878 | 61978 | 43937 | 35127 | 42716 |

Loss of agriculture production (in Tonnes) due to various disasters

| # | District | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012 - 13 | 2013 - 14 | 2014 - 15 |
|----|----------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|--------------|
| 1 | BILASPUR | 38643 | 36070 | 73390 | 15685 | 15750 | 2500 | 600 | 1545 |
| 2 | CHAMBA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4709 |
| 3 | HAMIRPUR | 40164 | 25912 | 5922 | 25603 | 14515 | 20116 | 915 | 1280 |
| 4 | KANGRA | 4756 | 40430 | 9325 | 765 | 0 | 0 | 0 | 0 |
| 5 | KINNAUR | 15 | 20 | 0 | 0 | 0 | 0 | 1018 | 57 |
| 6 | KULLU | 2418 | 14367 | 50253 | 20210 | 14806 | 3692 | 1279 | 0 |
| 7 | L&S | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 8 | MANDI | 5085 | 11718 | 18673 | 12247 | 39880 | 1935 | 14682 | 1808 |
| 9 | SHIMLA | 3216 | 0 | 4 | 0 | 0 | 0 | 0 | 115 |
| 10 | SIRMOUR | 2 | 54 | 12249 | 10890 | 32 | 0 | 0 | 971 |
| 11 | SOLAN | 1550 | 1700 | 2500 | 1000 | 52 | 1006 | 7719 | 2766 |
| 12 | UNA | 7620 | 97925 | 0 | 0 | 0 | 0 | 125 | 113 |
| HP | | 103469 | 228196 | 172316 | 86400 | 85037 | 29250 | 26338 | 16129 |

Loss of cash crops area (hectares) due to various disasters

| # | District | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012 - 13 | 2013 - 14 | 2014 - 15 |
|----|----------|-------------|--------------|--------------|-------------|-------------|--------------|-------------|-------------|
| 1 | BILASPUR | 2721 | 2810 | 1980 | 950 | 600 | 2593 | 100 | 442 |
| 2 | CHAMBA | 0 | 0 | 0 | 0 | 0 | 9495 | 0 | 950 |
| 3 | HAMIRPUR | 990 | 1347 | 249 | 318 | 318 | 455 | 136 | 249 |
| 4 | KANGRA | 1568 | 4408 | 6013 | 782 | 0 | 0 | 0 | 0 |
| 5 | KINNAUR | 5 | 10 | 0 | 0 | 0 | 0 | 809 | 33 |
| 6 | KULLU | 507 | 3355 | 6400 | 5810 | 4015 | 921 | 188 | 1924 |
| 7 | L&S | 22 | 0 | 0 | 3 | 0 | 24 | 55 | 0 |
| 8 | MANDI | 293 | 335 | 410 | 317 | 4512 | 4867 | 4867 | 869 |
| 9 | SHIMLA | 3070 | 0 | 393 | 0 | 60 | 0 | 20 | 1600 |
| 10 | SIRMOUR | 1 | 6 | 812 | 751 | 0 | 0 | 1 | 0 |
| 11 | SOLAN | 750 | 800 | 1000 | 600 | 2 | 1417 | 0 | 500 |
| 12 | UNA | 0 | 405 | 0 | 0 | 0 | 0 | 25 | 0 |
| HP | | 9927 | 13476 | 17257 | 9531 | 9507 | 19772 | 6201 | 6567 |

Loss of Cash Crops Production (in Tonnes) due to various disasters

| # | District | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012 - 13 | 2013 - 14 | 2014 - 15 |
|----|----------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| 1 | BILASPUR | 29200 | 15185 | 19575 | 7125 | 400 | 2068 | 122 | 1716 |
| 2 | CHAMBA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2982 |
| 3 | HAMIRPUR | 9899 | 13622 | 2559 | 3542 | 1710 | 10500 | 409 | 847 |
| 4 | KANGRA | 9408 | 35051 | 178 | 45 | 0 | 0 | 0 | 0 |
| 5 | KINNAUR | 3 | 37 | 0 | 0 | 0 | 0 | 1249 | 41 |
| 6 | KULLU | 139 | 23233 | 14770 | 23850 | 30183 | 7050 | 564 | 17189 |
| 7 | L&S | 0 | 0 | 0 | 0 | 0 | 5 | 355 | 0 |
| 8 | MANDI | 5440 | 6714 | 7243 | 6358 | 89200 | 2188 | 2188 | 3556 |
| 9 | SHIMLA | 23352 | 0 | 715 | 0 | 0 | 0 | 0 | 2500 |
| 10 | SIRMOUR | 3 | 7 | 3537 | 3414 | 0 | 0 | 0 | 0 |
| 11 | SOLAN | 850 | 950 | 1300 | 700 | 52 | 0 | 0 | 15482 |
| 12 | UNA | 0 | 4630 | 0 | 0 | 0 | 0 | 500 | 1203 |
| HP | | 78294 | 99429 | 49877 | 45034 | 12545 | 21811 | 5387 | 45516 |

The above data tells that there has been a huge loss to the sector in the loss of sown area, agriculture production, and loss of cash crops production due to various disasters in Himachal Pradesh. Moreover, none of the districts is devoid of this impact in the state. Therefore, the department needs to consider coming up with proper mitigation measures for the same.

3. RISK PREVENTION AND MITIGATION

3.1 RISK PREVENTION

Risk prevention is preventing the creation of new risks of disasters. Such risks may be created unwillingly by the Departments directly through public investments or indirectly through the facilitation of private investments that are vulnerable to the risks of disasters. Therefore, every investment should go through risk audit to check if new programmes, activities or projects have the potential to create new risks of disasters. If such investments cannot be avoided these must be protected by safeguards through adequate structural and non-structural prevention measures so that the benefits of investments are fully protected from risks of disasters. For example, assets of the agriculture department like offices, equipment's and others should be located at places which have lesser chances of getting affected by a hazardous event. The main idea here is what the department can do within its mandate to increase the idea of risk prevention.

Certain method which can be implemented for risk prevention are:

- The department will follow risk-sensitive approach while implementing any project in future. The idea of risk sensitivity already exists in the department. For example, the seeds provided in some areas are of the type which can be supplemented to help in a drought situation if the monsoon in that particular season is expected below average.
- Proper implementation of the government schemes and programs can also reduce the risks. The production of the farmers can be increased through various schemes of the department like those related to providing seeds, fertilizers and necessary equipment's etc. thus making the farming community more resilient to face a disaster situation.
- Establish programmes as long-term undertakings with a strong commitment to sustained effort rather than one-time action.
- The department should consider Disaster impact assessment while doing the Environment Impact assessment.
- Climate change adaptation is to be kept in mind at the time of implementation of a new project.

3.2 RISK MITIGATION

Risk mitigation is reducing the risks of disasters that are already there due to exposure and 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. Mitigation projects are always costly and therefore these have to be planned with proper Cost Benefit Analysis (CBA) to ensure that the benefits of the projects outweigh the costs. On the basis of its developmental responsibility, the department can liaise with other line departments and agencies for a coordinated mitigation approach.

The primary objective of mitigation efforts would be:

- To identify, delineate and assess the existing and potential risks to the agriculture sector and to work towards reducing potential casualties and damage from disasters.
- To substantially increase public awareness of disaster risk to ensure a safer environment for communities to live and work.
- To reduce the loss to agriculture sector due to disasters.

In view of the prevailing risk and the vulnerabilities perception, the mitigation measures proposed have been categorised under following five major groups:

| Hazard | Mitigation measures (structural and non-structural) |
|-----------------------|---|
| Earthquake | <p>Revision and adoption of model building bye-laws for the construction of departmental assets both in the urban and rural area.</p> <p>Undertaking mandatory technical audits of structural designs of major projects by the competent authorities.</p> <p>Assessing the seismic risk and vulnerability of the existing built environment by carrying out structural safety audits of all critical structures.</p> <p>Undertaking seismic strengthening and retrofitting of critical structures, initially as pilot projects and then extending the exercise to the other structures.</p> <p>Developing appropriate risk transfer instruments by collaborating with insurance companies and financial institutions.</p> |
| Drought | <p>A Drought Management Cell (DMC) will be established in the Agriculture Department.</p> <p>Drought management plan for the entire season will be prepared by the Agriculture Department well in advance.</p> <p>As the season progresses from June onwards, the DMC will review the plans prepared earlier at the onset of the monsoon and revise the strategy if required.</p> <p>Weekly monitoring of the season and crop condition from June onwards till the end of the season and make necessary midseason corrections as and when required.</p> <p>Awareness will be brought among the farmers on drought regulations and enforcement.</p> |
| Hailstorm | <p>The agriculture department at district level shall prepare a plan to take preventive action /measures to lessen the impact of hailstorm and prevent such occurrence.</p> <p>Such plan shall be prepared blockwise.</p> <p>Necessary measures shall be taken for mitigation the impact of such incident.</p> |
| Floods / Flash floods | <p>Along with DDMA, the department should demarcate the flood-prone area and no construction related to the department should be done there.</p> <p>Mitigation plan should be in place to safeguard the farmers/ inhabitants from the flash flood.</p> |
| Pest attack | <p>The department should provide pesticides to the farmers well in advance that is a proper early warning system should be established.</p> <p>IEC material on pest attack can be provided to the farmers.</p> <p>Should maintain a certain amount of stock for an emergency.</p> |
| Fire | <p>Fire extinguishers to be installed in all the office buildings. Also, the staff to be trained on how to operate a fire extinguisher.</p> |

1. **Risk assessment:** Risk information should be provided to the farmers on time and for that, a proper risk assessment should be done by the department.
2. **Repair and maintenance:** Retrofitting and renovation of the office buildings should be done by the department.
3. **Research and technology transfer:** The department should identify and interact with research institutions to evolve mitigation strategies.
4. **Training and capacity building:** Training programs about the awareness of disaster with respect to agriculture can be planned at the village level. The two, farmer training centre at Sundernagar and Mashobra already provide training to the farmer on a different aspect. These facilities can be used to train the farmers to use certain mitigation measures to fight against a disaster.
5. **Communication arrangements:** A free helpline can be made by the department which can guide the farmers on how to use various mitigation measures to fight against a disaster situation.

3.3 MATRIX OF HAZARD-SPECIFIC MITIGATION MEASURES (FOR THE ASSETS OF THE DEPARTMENT AS WELL AS THE SECTOR)

Among all above hazards, Agriculture Department plays a very important role in Droughts. The recurrence of drought in India is owed largely to the unique physical and climatic susceptibilities of the country, which include uneven distribution of rainfall, relative short window of 100 days during South- West Monsoon season when about 73% of the total annual rainfall of the country is received, over-exploitation of groundwater, limited irrigation coverage etc.

Drought vulnerability in Himachal Pradesh is primarily due to the fact that about two-thirds of the rural population of the state is dependent on agriculture and horticulture for earning their livelihood. Only about 23% of the total agriculture land is irrigated and the remaining land under agriculture has to depend on rain for irrigation. Uncertainties of nature render the majority of people highly vulnerable. Limited options due to climatic conditions coupled with the small size of operational holdings add further to the vulnerability conditions.

The Ministry of Agriculture and Farmers Welfare prepares a Crisis Management Plan for drought (CMP) before the commencement of each Kharif season. The CMP provides a crisis management framework to identify phases of the crisis and the strategic response corresponding to each such phase. The plan also provides for a Strategic Activity Planner to act as a ready reckoner for critical steps that need to be taken in different times of the year with respect to drought preparedness, drought reporting and drought response, and the agencies responsible for the identified activities.

Careful advance preparation is critical to an effective response and containment of drought. The ambit of preparedness should extend to the following:

- Establishment of a functional DMC at the State Headquarters.
- Preparation of Agriculture Contingency Plans for districts and sub-district levels, especially in vulnerable districts.
- Identification of drought-prone areas, preferably at the sub-district level. Monitoring of seasonal forecasts of IMD and other national/international agencies.
- Prepositioning of inputs like drought resilient variety seeds at strategic locations.
- The Agriculture Department through its various bodies and especially through ATMA would encourage individual farmers to undertake cultivation of fodder, wherever possible. It would provide fodder seeds and fertilizers to the farmers for cultivating fodder, wherever possible; and extension services for undertaking short duration grasses and seasonal fodder crops.

- Activate agricultural extension to encourage a shift to crops and varieties that are not water guzzlers and recommend agronomic practices that promote conservation of water and soil moisture.
- Creation of drought contingency cells in districts to monitor dry spells.
- It can also undertake cultivation of fodder on the land owned by the agricultural universities. Generally, agricultural universities have huge tracts of land, which could be used for this purpose.
- Develop protocols for various departments to initiate contingency measures with clear allocation of responsibilities.

4. MAINSTREAMING DISASTER RISK REDUCTION IN DEVELOPMENT

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. Mainstreaming disaster management into the development planning process essentially means looking critically at each activity that is being planned, not only from the perspective of reducing the disaster vulnerability of that activity but also from the perspective of minimizing that activity's potential contribution to the hazard.

Every development plan in the state would require incorporating elements of impact assessment, risk reduction, and adoption the 'do no harm' approach. The linkage of DRR in Development has the following three purposes to achieve: -

- To make the future environment free from construction risk.
- To utilize the funds of the govt. to mitigate the vulnerability to any disaster, thus progressing towards physical, socio-economic and environmental vulnerability free era.
- To make sure that all the govt. plans should be integrated with disaster risk reduction programmes by integrating such elements in these plans so that disaster risk-free environment can be created.

Although there are several schemes advocating disaster management measures, out of which some of them are as follows:

| Name of Scheme | Key Component of the scheme | Key activities for mainstreaming |
|---|---|--|
| Soil and Water Conservation | <ul style="list-style-type: none"> • Soil Conservation Works • Water conservation and development | <ul style="list-style-type: none"> • Incorporating DRR in this scheme can involve risk assessment of places which are more prone to landslides. |
| Mukhyamantri Kisaan Evam Khetihar Mazdoor Jeevan Suraksha Yojna | <ul style="list-style-type: none"> • Insurance cover to the Farmers and Agricultural Labourers in the event of sustaining injury or death due to the operation of farm machinery. • In the case of the death and permanent disability, compensation of Rs.1.5 Lakh. • In the case of partial disabilities, compensation up to Rs. 50,000 | <ul style="list-style-type: none"> • Providing insurance support to the farmers |
| Mukhya Mantri Khet Sanrakshan Yojna: | <ul style="list-style-type: none"> • Farmers will be provided 60 percent assistance for fencing the farm. • The fence will be energized with the help of solar power or electricity. • Approximately, crops for 1300 hectares cultivated areas shall be protected from wild/ stray animals and monkey menace under this scheme. | <ul style="list-style-type: none"> • Increasing the protected area to 2000 hectares from monkey menace • Including the idea of risk mitigation in maintaining the livelihood of the farmers. |

| | | |
|--|--|---|
| Pradhanmantri Fasal Bima Yojna | <ul style="list-style-type: none"> • The scheme provides comprehensive risks insurance against yield losses viz. drought, hailstorm, floods and pests disease etc. • Compensation for preventive sowing, sowing failure, post-harvest losses at the individual level, localized calamity at the individual level at the early settlement of the claim. • The farmer's premium has been kept at 2% for Kharif Crops, 1.5% for Rabi Crops and 5% for commercial/ Horticulture Crops. Major cereal crops i.e. Maize & Paddy during Kharif and Wheat & Barley have been covered under it. • Standing Crop (Sowing to Harvesting): Comprehensive risk insurance is provided to cover yield losses due to non-preventable risks viz. Drought, Dry Spell, Flood, Inundation, Pests and Diseases, Land Slides, Natural Fire and Lightning, Storm, Hailstorm, Cyclone, Typhoon, Tempest, Hurricane and Tornado etc. • Localized Calamities: Loss/ damage resulting from the occurrence of isolated farms in the notified area. | <ul style="list-style-type: none"> • If the rising risk of monkey menace can be included in the scheme then it will have more fruitful results for the farming community. |
| Restructured Weather Based Crop Insurance Scheme (RWBCIS): | <ul style="list-style-type: none"> • The scheme intends to provide Insurance protection to the cultivators against weather incidence such as Rainfall, Heat (Temperature). Relative Humidity, Hail Storm, Dry Spell etc., which are deemed to adversely affect the Kharif Crops during its cultivation period. • Vegetable crops like Tomato, Potato Ginger, Peas, Garlic and Capsicum have been covered under this scheme. The farmers have to pay only 5% premium of the Sum Insured or Actuarial Rate whichever is less. | <ul style="list-style-type: none"> • There is a need to cover all these crops under RWBCIS in the State in phased manner |
| Plant Protection | <ul style="list-style-type: none"> • About 150 MT of pesticides through 991 sale centres are supplied to the farmers. • The plant protection material including equipment are supplied to the SCs / STs /IRDP families at 50% cost which would help them to fight against the pest attack | <ul style="list-style-type: none"> • Incorporating DRR measures like awareness among the farmers about pest attack, right pesticide usage can help the farmers to increase their resilience. |
| H.P. Crop Diversification Project (JICA ODA Loan Project) | <ul style="list-style-type: none"> • This project plans to achieve many objectives like increased area and production of vegetables, to promote organic farming, to raise the income of small and marginal farmers etc. | <ul style="list-style-type: none"> • A small integration of the idea of risk assessment can be added to the scheme which will help the farmers in the longer run |
| Special Project on Diversification of Agriculture | <ul style="list-style-type: none"> • Promotion of micro irrigation and drip irrigation. | <ul style="list-style-type: none"> • Incorporation of DRR methods like micro-irrigation here can help in mitigating the effect of |

| | | |
|---|--|--|
| through Micro Irrigation and Other Related Infrastructure in H.P. | | <p>drought from some of the areas.</p> <ul style="list-style-type: none"> • Training of the farmers on Disaster management. |
| Dr Y. S. Parmar Kisan Sawrozgar Yojna | <ul style="list-style-type: none"> • Project components include the creation of need-based infrastructure and are expected to fulfil objectives of high productivity, quality, safeguard against adverse weather, efficient input use etc. • Project components include construction of location-specific models of poly houses with micro-irrigation facility. • For this, 85% project assistance shall be provided to the farmers | <ul style="list-style-type: none"> • Incorporation of DRR like the construction of hazard-resistant poly houses will help in better utilization of the scheme. • Risk assessment of the need-based infrastructure can help in decreasing the disaster risk. |
| Rajiv Gandhi Micro-Irrigation Scheme | <ul style="list-style-type: none"> • Through this Project, 8,500-hectare area will be brought under Drip/ Sprinkler Irrigation System benefitting 14,000 farmers | <ul style="list-style-type: none"> • Drought management training |
| Extension And Farmers Training | <ul style="list-style-type: none"> • The Department runs two training centres, one at Mashobra and other at Sundernagar. Besides this farmers training camps are organised at the village, block and district level. | <ul style="list-style-type: none"> • Training on basic first aid, first responders can be provided along with the training provided in the institute. |
| Rashtriya Krishi Bima Yojna (RKBY) | <ul style="list-style-type: none"> • To provide insurance coverage and financial support to the farmers in the event of failure of any of the notified crop as a result of natural calamities, pests & diseases. • To encourage the farmers to adopt progressive farming practices, high-value in-puts and higher technology in Agriculture. • To help stabilise farm incomes, particularly in disaster years. | <ul style="list-style-type: none"> • Incorporate the idea of DRR by doing risk assessments like that of chances of crop failure for the farmers. |
| National Mission On Sustainable Agriculture (NMSA 90:10) | <ul style="list-style-type: none"> • It has been formulated for enhancing agricultural productivity especially in rain-fed areas focusing on integrated farming, water use efficiency, soil health management and synergizing resource conservation. | <ul style="list-style-type: none"> • The various dimensions of the schemes like 'water use efficiency', 'nutrient management', 'livelihood diversification' can also include a part of disaster management in then which can help in building a resilient community in the State. |

5. DISASTER PREPAREDNESS

Disaster preparedness has been defined as “the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof”. The Department may review their “state of readiness” and prepare a strategic action plan to deal with possible disaster situations. The department already has maintained a certain level of preparedness, for example, the Rabi season starts in October and preparation of seeds, equipment’s, and machinery starts 4-5 month in advance.

Department of Agriculture can take the following measure to make the department disaster ready:

5.1 DEPARTMENT PREPAREDNESS

- Designate a focal point for disaster management within the department;
- Geo-tagging of all the assets can be done to assess the post-disaster losses if any;
- Formation of EOC and incident response team should be done beforehand;
- Secondary database management plan for important documents;
- Awareness about the preparedness of the disaster should be given to all the employees of the department not only the nodal officer;
- Analyse past experiences of the Department to know what went well and what could have been done better for risk reduction and emergency response by the department;
- Document it as lessons learnt annually and after every disaster;
- Check available stocks of equipment and materials which are likely to be most needed during disasters like floods and droughts;
- All valuable equipment’s and instruments should be packed in protective coverings and stored in room the most damage-proof;
- Create mechanism for regular Inspection and maintenance of equipment and acquisition of new equipment as per your minimum inventory list for disaster risk reduction;
- Stock maintenance of agriculture-related products should be planned beforehand as the very process of procurement is too cumbersome;
- Emergency numbers can be displayed on the notice board;
- Stock agricultural equipment’s which may be required after a disaster;
- Provide information to all concerned, about disasters, likely damages to crops and plantations, and information about ways to protect the same;

5.2 SECTOR PREPAREDNESS

- Prepare maps showing population concentration and distribution of resources;
- Identify areas likely to be affected;
- Arrangements for keeping stock of seeds, fertilizers and pesticides to be done;
- Develop district contingency action plan based on HRV;
- Determine the type of damage, pests or disease may cause crop wise and identify the insecticide required for the purpose, in addition to requirement of setting up extension teams for crop protection and accordingly ensure that extra supplies and materials, be obtained quickly;
- Suggest variety of seeds and cropping pattern, which can reduce losses and reduce the risks to farmers;
- Ensure that certified seeds of required varieties are available in adequate quantities;

- Develop a pest and disease monitoring system so that timely steps can be taken to reduce damage to crops;
- Check the availability of seeds and disseminate information about the outlets where seeds can be made available;
- Set up a public information centre for providing information sowing of crops, alternative crops, pests and application of fertilisers;
- Prepare a schedule for a spray of pesticides and insecticides after the disaster.

6. DISASTER RESPONSE, RECOVERY AND REHABILITATION

6.1 RESPONSE PLAN

The response plan of the Department includes the design of actions based on Standard Operating Procedures and tested through mock drills and exercises that would be initiated by a trigger mechanism based upon the impending or actual occurrence of an event of a disaster. Many Departments and agencies of the State Governments will be required to perform important functions relating to relief and rehabilitation. The response plan of the Department should provide detail with the logistic, financial and administrative support necessary for discharging these functions and the manner in which these functions shall be discharged. As per the SDMP following are the roles and responsibilities of the Agriculture Department:

6.1.1 TRIGGER MECHANISM FOR RESPONSE:

- The nodal officer for disaster management in the department shall be responsible for coordination with EOC, ESF nodal and support agencies and other departments.
- Establish communication with SEOC, DDMA, Deputy Commissioner and District Control Room and Agriculture Universities
- If EOC at district level declares it as an emergency situation and Response plan is activated, disseminate the information to all staff, key stakeholders etc.
- Call for a coordination meeting of the key officer to take stock of the situation, the impact of the disaster on department capacity, immediate actions for a response like need and damage assessments, coordination with ESF and Incident response system /EOC, coordination with community-level committees and other key stakeholders.
- Organize distribution of seeds, seedlings, fertilizer and implements to the affected people;
- Monitor damage to crops and identify steps for early recovery;
- A disaster response team within the department can be made with specific designation and assigned role to every individual;
- Estimate the requirement of
 - Seeds
 - Fertilizers
 - Pesticides and Labour
- Organise transport, storage and distribution of the above with adequate record keeping procedures;
- Ensure that adequate conditions for cleaning operations are maintained to avoid water-logging and salinity;
- Print and widely distribute the list of points where certified seeds are available along with names of varieties and rates. Notices may be affixed at public places such as bus stands, on buses themselves, PHCs, Block headquarters, Tehsils etc.;
- Recall important functionaries from leave: communicate to the staff to man their places of duties like the ward and divisional offices and respective departments;
- Call for an emergency meeting to take stock of the situation. Develop a strategy and objectives;
- Establishment information centres through KVKS and extension network and assists in providing an organized source of information.

6.1.2 RESPONSE PLAN ON RECEIPT OF EARLY WARNING

The activity required are:

- To direct the officers of all level in the department to provide support and regular help to the subdivision officers, district magistrate, disaster management agencies and other local administration.
- Informing the relevant offices and people about dos and don'ts in case the disaster happens.
- Support in the dissemination of Early Warning information once approved by SDMA.

6.2 DISASTER RELIEF AND REHABILITATION:

Relief measures will vary with the nature and degree of natural calamity. Information on the amount of damage done will help in deciding the extent of relief, reconstruction or rehabilitation. Following steps can be taken by the department of agriculture in a post-disaster situation:

- Quantify the loss and damage within the quickest possible time and finalizes planning of agriculture rehabilitation;
- Ensure availability of adequate supply of seeds, seedlings, fertilizers, pesticides and agricultural implements;
- Assist farmers to re-establish their contacts with agriculture produce market and ensure that appropriate prices be offered to them;
- Provide information to NGOs and other organization about the initiative and resources of the department;
- Assess the extent of damage to soil, crop, plantation, micro-irrigation systems and storage facilities and the requirements to salvage or re-plantation through KVKS.

7. DISASTER RECOVERY AND RECONSTRUCTION

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. Therefore, some of the Emergency Support Functions of recovery of the sector may continue for months. Departmental DM Plans should anticipate eventualities of longer duration recovery operations. The strategy adopted for this as per the emergency functions assigned to the department at the district level and nodal departments will be as below:-

Short-Term Reconstruction Activities: This should further include immediate restoration activities like the restoration of the basic infrastructure of the department assets, providing compensation to the farmers under various schemes available within the department mandate.

Long-Term Reconstruction Planning: Once the minimum basic reconstruction is being done the department should take immediate action for long-term recovery of its own sector. For example, if a region is struck by drought, the department should try providing that variety of seed to the farmer which can be grown with less irrigation. The department in this way should try to minimize the vulnerability of the people in its sector.

Further, the SDMP and DDMP state that the department of agriculture is responsible for the following three functions in context to recovery and reconstruction:

- Quantify the losses of the crops and the measures to be taken to recoup the same.
- Assist the farmers to sow the less time period crop to recover the loss.
- Execute the schemes to eliminate the drought effects.

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.

8.1 REVENUE SECTION: (RS. IN LAKH)

| # | Major Head of Development | Non-Plan | Plan | Total | Flow to Sub Plans | | | | |
|---|------------------------------------|----------|----------|----------|-------------------|--------|---------|-------|---------|
| | | | | | General | TASP | SCCP | BASP | Others |
| 1 | Crop Husbandry | 11138.46 | 20956.00 | 32094.96 | 8858.00 | 441.00 | 3038.00 | 30.00 | 8589.00 |
| 2 | Tea Plantation | 158.82 | 35.00 | 193.82 | 28.00 | - | 7.00 | - | - |
| 3 | Building | - | 175.00 | 175.00 | 95.00 | 13.00 | 37.00 | 30.00 | - |
| 4 | Soil and Water Conservation | 2547.73 | 1183.00 | 5548.73 | 167.00 | 80.00 | 123.00 | - | 813.00 |
| 5 | (i) R.I.D.F | - | 2712.00 | 2712.00 | 1795.00 | 60.00 | 630.00 | - | 227.00 |
| | (ii) 4402 Building | - | 40.00 | 40.00 | - | - | - | 40.00 | - |
| 6 | Research and Education | 0.01 | 7600.00 | 7600.01 | 5002.00 | 684.00 | 1914.00 | - | - |
| 7 | Biogas Development | 481.87 | 30.00 | 511.87 | - | - | - | - | 30.00 |
| 8 | Maintenance of Government Building | 9.96 | - | 9.96 | - | - | - | - | - |

8.2 CAPITAL OUTLAY: (RS. IN LAKH)

| # | Major Head of Development | Non-Plan | Plan | Total |
|--------------------------|--|----------------|----------|----------------|
| 1 | Purchase of Seeds | 3307.22 | - | 3307.22 |
| 2 | Purchase of Fertilizers | 16.38 | - | 16.38 |
| 3 | Purchase of Plant Protection Materials | 217.65 | - | 217.65 |
| 4 | Purchase of Implements / Machinery | 251.11 | - | 251.11 |
| TOTAL CAP. OUTLAY | | 3792.36 | - | 3792.36 |

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 departments should be able to allocate such funds within their normal budgetary allocations.

Here the idea is to come up with a separate disaster management budget head within the budget allocation of the department.

This budget can be used to work on the already suggested mitigation and preparedness measures, as response and relief are already being taken care of by the SDRF and NDRF.

This budget head can work with a very basic amount initially as the marginal costs involved in mainstreaming DRR in existing programme is not very sizable. Also, the funds required for risk assessments and disaster preparedness are also not very large. This budget will help in institutionalising the entire process. And once the department starts having a separate budget for prevention and mitigation, at least some measures will start automatically.

The department told that they can have a budget head of **10 percent of the total amount** in the disaster management budget head, as most of the schemes are directly related to disaster management.

