

State: HIMACHAL PRADESH
Agriculture Contingency Plan for District: Chamba

| 1.0 District Agriculture profile | | | | |
|--|--|--|--|-------------|
| 1.1 | Agro-Climatic/Ecological Zone | | | |
| | Agro Ecological Sub Region (ICAR) | Western Himalayas, Warm Subhumid (To Humid With Inclusion Of Perhumid) Eco-Region. (14.2) | | |
| | Agro-Climatic Zone (Planning Commission) | Western Himalayan Region (I) | | |
| | Agro Climatic Zone (NARP) | Mid Hills Sub-Humid Zone (HP-2) | | |
| | List all the districts falling under the NARP Zone>(*>50% area falling in the zone) | Bilaaspur, Hamiirpur, Lahul&Spiti, Shimla, Kullu, Solan, Chamba, Mandi, Kangra and Sirmaur, Solan | | |
| | Geographic coordinates of district headquarters | Latitude | Longitude | Altitude |
| | | 32⁰11'30" and 33⁰13'6" N | 75⁰49' and 77⁰3'30" E | 926m |
| | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | Regional Horticulture Research Station, Dr YS Parmar University of Horticulture and Forestry -Mashobra(Shimla)Phone No: 0177-2740261, 2740793 FAX-2740092,2740793 | | |
| Mention the KVK located in the district with address | Krishi Vigyan Kendra, Saru, Chamba , Himachal Pradesh – 176 310. Phone: 01899- 232219 (O), 01899- 232 144 (R). Dr. M.L. Bhardwaj, Sr. Programme Coordinator (09418144057) kvkchamba@yahoo.in | | | |
| Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone | IMD, Shimla | | | |

| 1.2 | Rainfall | Normal RF(mm)* | Normal Onset (specify week and month) | Normal Cessation (specify week and month) |
|------------|-----------------------|-----------------------|---|--|
| | SW monsoon (June-Sep) | 616.86 | 4 th week of June | 1 st week of September |
| | NE Monsoon (Oct-Dec) | 60.73 | | |
| | Winter (Jan- March) | 215.56 | | |
| | Summer (Apr-May) | 119.28 | | |
| | Annual | 1012.425 | | |

Average rainfall from 1991 to 2010, KVK, Chamba

| | | | | | | | | | | | |
|------------|---|--------------------------|------------------------|--------------------|--|---------------------------|-----------------------------|---|-------------------------------------|------------------------|----------------------|
| 1.3 | Land use pattern of the district (latest statistics) | Geographical Area | Cultivable area | Forest area | Land under non-agricultural use | Permanent pastures | Cultivable wasteland | Land under Misc. tree crops and groves | Barren and uncultivable land | Current fallows | Other fallows |
| | Area ('000 ha) | 692.4 | 45.3 | 272.0 | 11.7 | 353.0 | 7.2 | 0.015 | 5.5 | 2.4 | 1.0 |

Department of Economics and Statistics, Govt. of HP

| | | | |
|------------|---|-----------------------|-----------------------------|
| 1.4 | Major Soils (common names like red sandy loam deep soils (etc.,)*) | Area ('000 ha) | Percent (%) of total |
| | Brown forest soils | | |
| | Humus and iron podzols | | |
| | Alpine humus mountain skeletal soils | | |

| | | | |
|------------|------------------------------|-----------------------|-----------------------------|
| 1.5 | Agricultural land use | Area ('000 ha) | Cropping intensity % |
| | Net sown area | 41.9 | 159.2 |
| | Area sown more than once | 24.8 | |
| | Gross cropped area | 66.7 | |

| | | | | |
|------------|------------------------------|-----------------------|-----------------------|---|
| 1.6 | Irrigation | Area ('000 ha) | | |
| | Net irrigated area | 5.2 | | |
| | Gross irrigated area | 30 | | |
| | Rainfed area | 36.7 | | |
| | Sources of Irrigation | Number | Area ('000 ha) | Percentage of total irrigated area |
| | Canals | - | - | - |
| | Tanks | - | - | - |
| | Open wells | - | - | - |

| | | | |
|--|---|----------|---|
| Bore wells | - | - | -- |
| Lift irrigation schemes | - | - | - |
| Micro-irrigation | - | - | - |
| Other sources (please specify) Kuhls and streams | - | - | - |
| Total Irrigated Area | | 5.2 | 100.0 |
| Pump sets | | NA | NA |
| No. of Tractors | | NA | NA |
| Groundwater availability and use* (Data source: State/Central Ground water Department /Board) | No. of blocks/ Tehsils | (%) area | Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc) |
| Over exploited | - | - | - |
| Critical | - | - | - |
| Semi- critical | - | - | - |
| Safe | | - | - |
| Wastewater availability and use | | - | - |
| Ground water quality | Good, EC<750 μ mhos/cm at 25 ⁰ C | | |

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

1.7 Area under major field crops & horticulture (as per latest figures)(2006-07)

| 1.7 | Major field crops cultivated | Area ('000 ha) | | |
|-----|--------------------------------|----------------|-----------|---------|
| | | Total | Irrigated | Rainfed |
| | Maize | 28.2 | 1.0 | 27.2 |
| | Paddy | 2.7 | 2.7 | - |
| | Wheat | 21.3 | 3.6 | 17.6 |
| | Barley | 3.1 | 0.3 | 2.7 |
| | Pulses (Black gram & Rajmash) | 3.4 | 0.07 | 3.3 |
| | Oil seeds (Brown Sarson, Raya) | 2.9 | 0.03 | 2.9 |

State Statistical Abstract of HP, 2008-09

| | |
|-----------------------------|---------------------------------|
| Horticulture crops – | Area ('000 ha) (2007-08) |
|-----------------------------|---------------------------------|

| | Fruits | Total | Irrigated | Rainfed |
|--|-----------------------------------|--------------|------------------|----------------|
| | Apple | 11.5 | - | 11.5 |
| | Other temperate fruits | 1.4 | - | 1.4 |
| | Walnut and Dry fruits | 1.5 | - | 1.5 |
| | Citrus | 0.7 | - | 0.7 |
| | Other fruits (Plum, Apricot etc.) | 0.6 | - | 0.6 |

| | Horticulture crops – Vegetables | Total | Irrigated | Rainfed |
|--|--|--------------|------------------|----------------|
| | Peas | 0.870 | - | 0.870 |
| | Tomato | 0.123 | - | 0.123 |
| | Beans | 0.447 | - | 0.447 |
| | Cabbage | 0.064 | - | 0.064 |
| | Potato | 0.7 | - | 0.7 |

District agricultural Plan, Vol II, Chamba

| | Medicinal and Aromatic crops | Total | Remarks |
|--|-------------------------------------|---------------------|---|
| | Kalazeera | Less than 1 hectare | The medicinal plants are naturally found in forests and local inhabitants traditionally collect them as a source of supplementary farm income. However, cultivation of medicinal plants is also encouraged in isolated blocks and different |
| | Lavander | 5.8 hectare | |

| | | | |
|--|----------|---------------------|---|
| | Dhoop | Less than 1 hectare | medicinal plant species are also cultivated by few of progressive farmers |
| | Karu | Less than 1 hectare | |
| | Ratanjot | Less than 1 hectare | |

District agricultural Plan, Vol II, Chamba

| | Plantation crops | Total | Irrigated | Rainfed |
|--|--|--------------|-----------|--------------|
| | No plantation crops are available in Chamba district | - | - | - |
| | Fodder crops* | - | - | - |
| | Total fodder crop area | - | - | - |
| | Grazing land | 353 (000 ha) | - | 353 (000 ha) |
| | Sericulture etc | - | - | - |
| | Others (specify) | - | - | - |

| 1.8 | Livestock | Total ('000) |
|-----|---------------------------------|---------------|
| | Cattle | 290.9 |
| | Buffaloes | 41.4 |
| | Goat | 184.8 |
| | Sheep | 281.4 |
| | Others (Camel, Pig, Yak etc.) | 6.4 |
| | Commercial dairy farms (Number) | Not Available |

| | | | |
|------------|----------------|---------------------|----------------------------------|
| 1.9 | Poultry | No. of farms | Total No. of birds ('000) |
| | Commercial | - | - |
| | Backyard | - | 58.2 |

| | | | | | | | |
|-------------|---|-------------------------------|--------------|-------------------------------|------------------------------------|--|---|
| 1.10 | Fisheries (Data source: Chief Planning Officer) | | | | | | |
| | A. Capture | | | | | | |
| | i) Marine (Data Source: Fisheries Department) | No. of fishermen | Boats | | Nets | | Storage facilities (Ice plants etc.) |
| | Nil | | Mechanized | Non-mechanized | Mechanized (Trawl nets, Gill nets) | Non-mechanized (Shore Seines, Stake & trap nets) | |
| | | 322 | - | - | - | - | - |
| | ii) Inland (Data Source: Fisheries Department) | No. Farmer owned ponds | | No. of Reservoirs | | No. of village tanks | |
| | 270 M.T | 6 | | 3 | | 18 | |
| | B. Culture | | | | | | |
| | | | | Water Spread Area (ha) | Yield (t/ha) | Production ('000 tons) | |
| | i) Brackish water (Data Source: MPEDA/ Fisheries Department) | | | - | - | - | |
| | ii) Fresh water (Data Source: Fisheries Department)* | | | - | - | - | |
| | Others | | | | | | |

1.11 Production and Productivity of major crops

| | | | | | | | | | |
|-------------|---------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|
| 1.11 | Name of crop | Kharif | | Rabi | | Summer | | Total | |
| | | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) |

| | | | | | | | | | |
|--|-----------------------------------|-------|--------|-------|---------|--|--|-------|--------|
| | Maize | 74.09 | 2060.0 | | | | | 74.09 | 2060.0 |
| | Rice | 3.69 | 1280.0 | | | | | 3.69 | 1280.0 |
| | Wheat | | | 32.83 | 1585.00 | | | 32.83 | 1585.0 |
| | Barley | | | 4.83 | 1365.4 | | | 4.83 | 1365.4 |
| | Pulses(Black gram and Rajmash) | 1.25 | 260.66 | | | | | 1.25 | 260.6 |
| | Oil seeds(Brown sarson and Raya) | | | 0.54 | 180.8 | | | 0.54 | 180.8 |
| | Horticulture - fruits | | | | | | | | |
| | Apple | 9.414 | 460.0 | | | | | 9.414 | 460.0 |
| | Other Temperate fruits | 0.518 | 300 | | | | | 0.518 | 300 |
| | Walnut and Dry fruits | 0.322 | 210.0 | | | | | 0.322 | 210.0 |
| | Citrus | 0.906 | 1530.0 | | | | | 0.90 | 1530.0 |
| | Other fruits (Plum, Apricot etc.) | 1.99 | 1545.0 | | | | | 1.991 | 1545.0 |

| 1.12 | Sowing window for 5 major field crops (start and end of normal sowing period) | Maize | Paddy | Wheat | Barley | Pulses (Rajmash/ Black gram) | Oilseed Crops (Gobhi Sarson, Raya) | Potato | Vegetables (Pea, Tomato, Cabbage, capsicum, Cauliflower) |
|------|---|---|---|--|---|---|---|---|--|
| | Kharif- Rainfed | 1 st week of June - 2 nd week of July | - | - | - | 2 nd week of June - 2 nd week of July | - | 1 st week of April | 1 st week of March - 4 th week of June |
| | Kharif-Irrigated | - | 2 nd week of June - 2 nd week of July | - | - | - | - | 1 st week of April | 1 st week of March - 4 th week of June |
| | Rabi- Rainfed | - | - | 4 th week of October - 2 nd week of November | 1 st week of November - 3 rd week of November | - | 1 st week of November - 3 rd week of November | 2 nd week of January - 4 th Week of January | 1 st week of October - November |

| | | | | | | | | | |
|--|----------------|---|---|---|---|---|---|--|--|
| | Rabi-Irrigated | - | - | 4 th week of October to 2 nd Week of November | - | - | - | 2 nd week of January- 4 th Week of January | 1 st week of October - November |
|--|----------------|---|---|---|---|---|---|--|--|

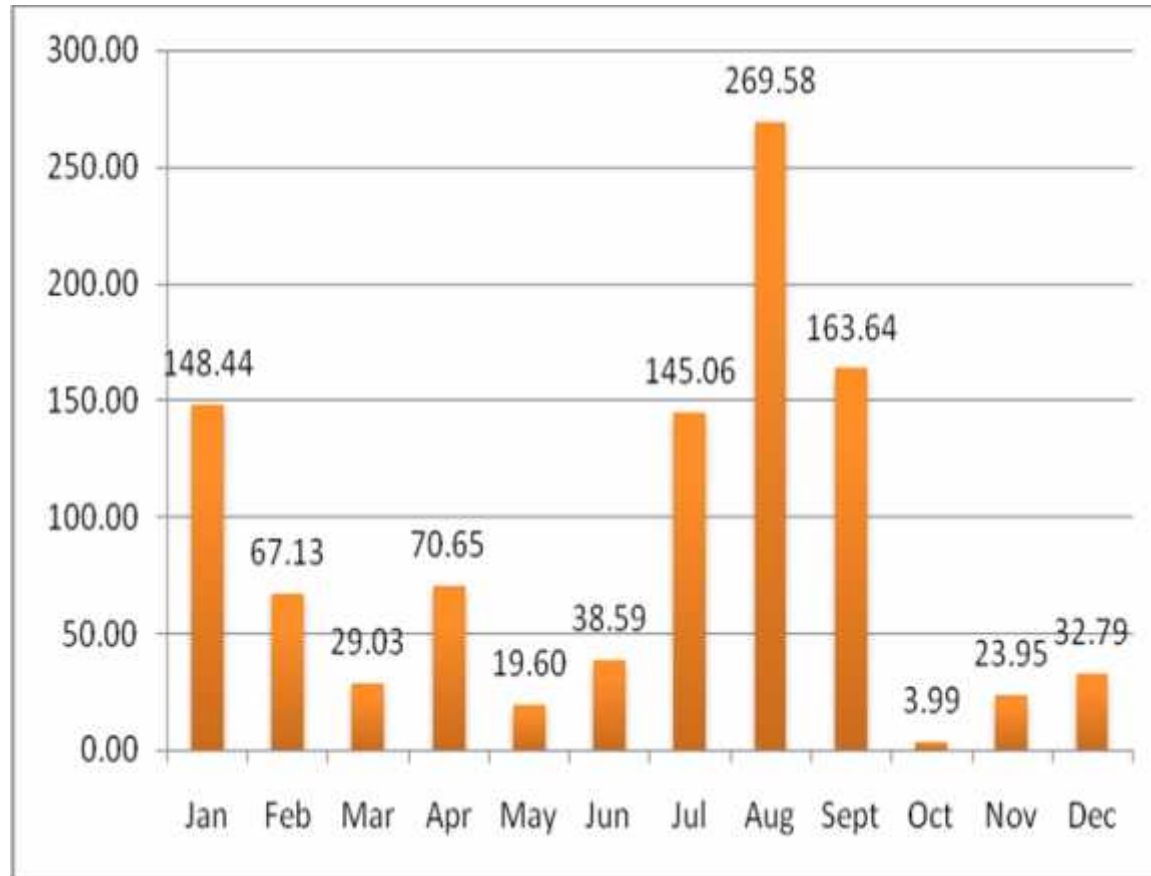
| What is the major contingency the district is prone to? (Tick mark) | | Regular | Occasional | None |
|---|--------------------------------------|---------|------------|------|
| | Drought | | | |
| | Flood | | | |
| | Cyclone | | | |
| | Hail storm | | | |
| | Heat wave | | | |
| | Cold wave | | | |
| | Frost | | | |
| | Sea water intrusion | | | |
| | Pests and disease outbreak (specify) | | | |
| | Others (specify) | - | - | - |

| | | | |
|-------------|---|---|---------------|
| 1.14 | Include Digital maps of the district for | Location map of district within State as Annexure I | Enclosed: Yes |
| | | Mean annual rainfall as Annexure 2 | Enclosed: Yes |
| | | Soil map as Annexure 3 | Enclosed: Yes |

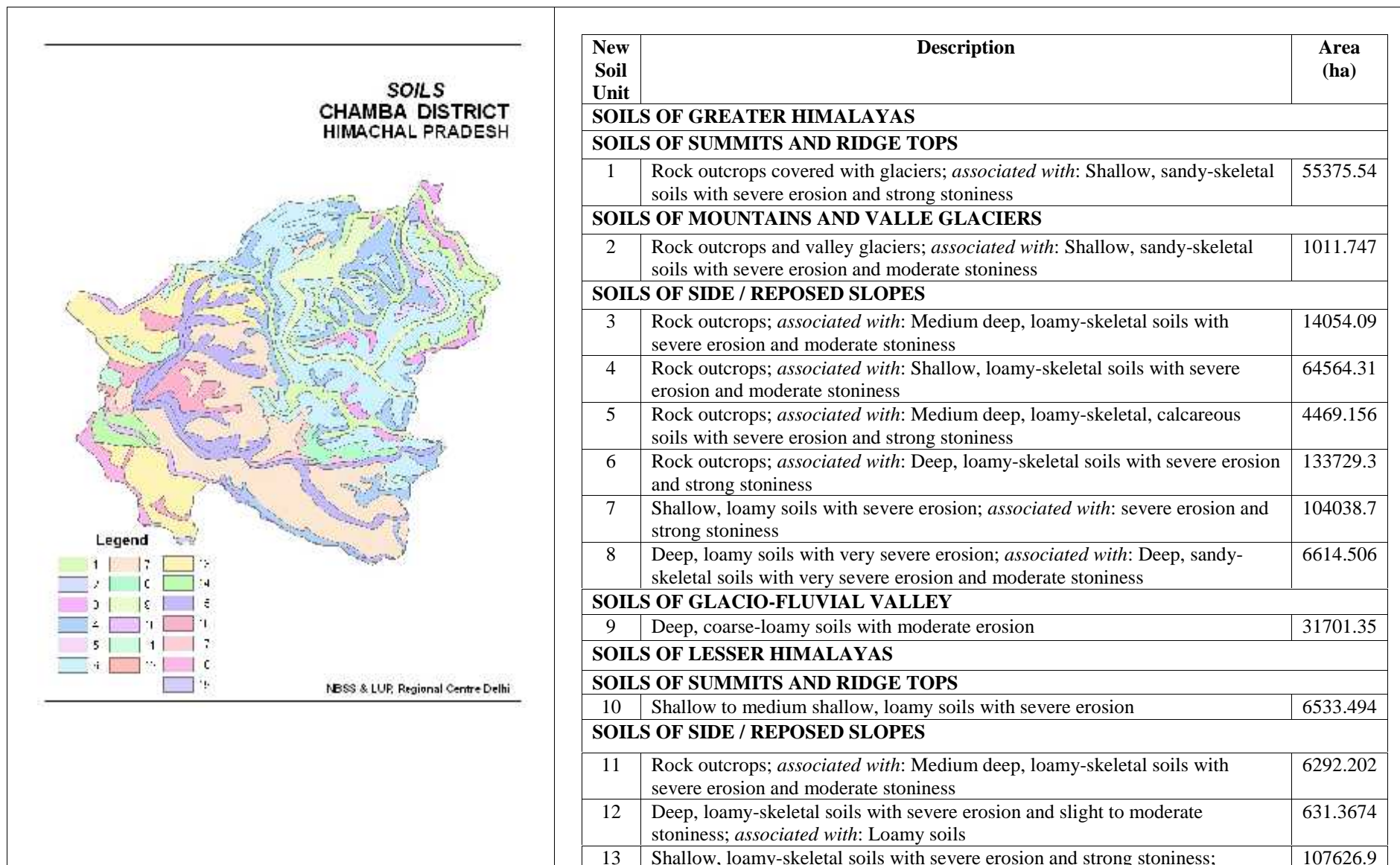
Annexure I



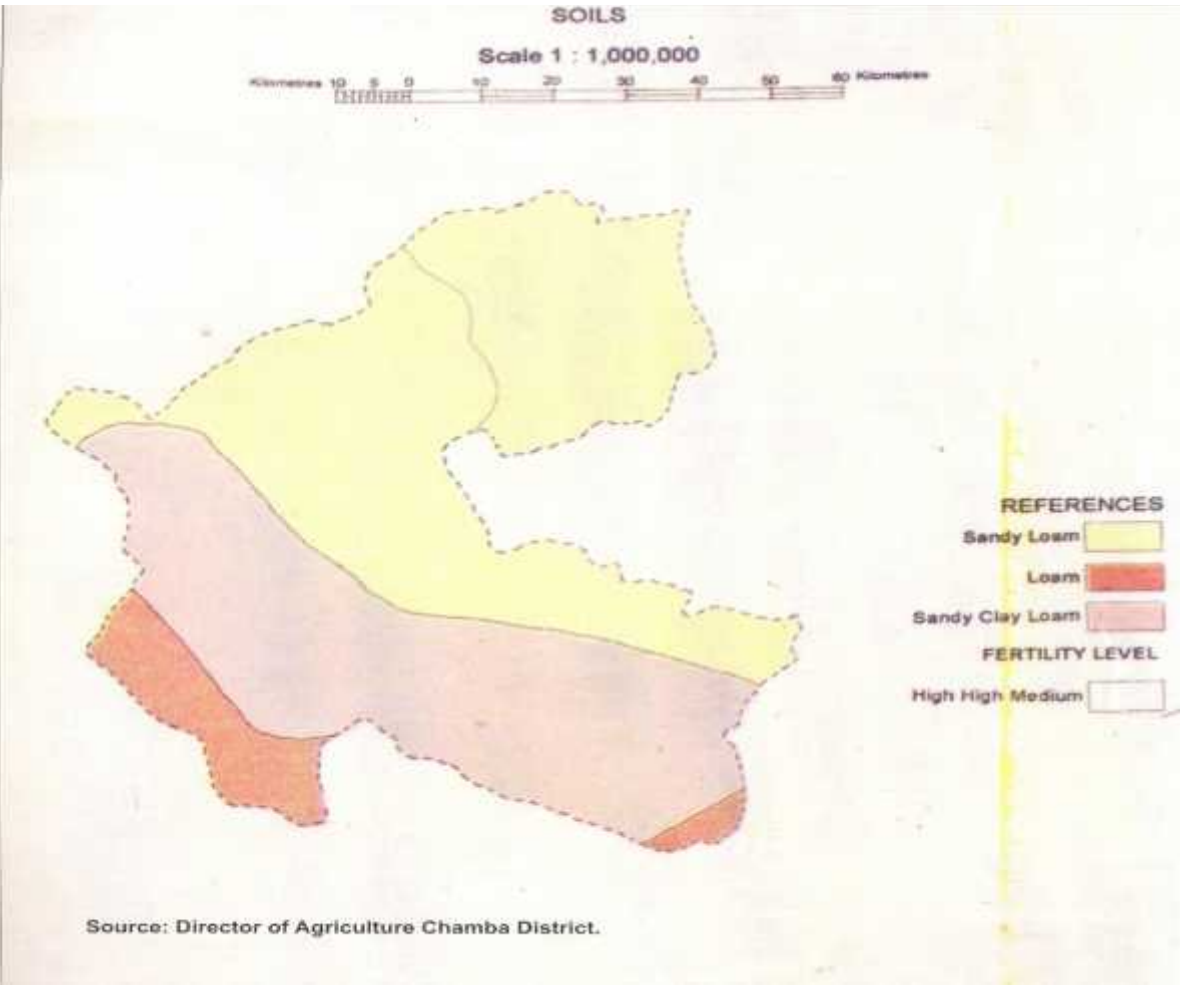
Annexure II



Annexure III



| | | | |
|---------------------------------------|--|--|-----------------|
| | | <i>associated with:</i> Rock outcrops | |
| 14 | | Deep, loamy soils with severe erosion | 7504.967 |
| 15 | | Shallow to medium deep, loamy soils with moderate to severe erosion and slight stoniness | 54811.21 |
| 16 | | Medium deep to deep loamy soils with moderate to severe erosion | 18250.16 |
| 17 | | Deep, loamy over sandy soils with very slight erosion and moderate stoniness; <i>associated with:</i> Shallow, loamy soils with moderate erosion and moderate stoniness | 4902.286 |
| SOILS OF SIDE / REPOSED SLOPES | | | |
| 18 | | Medium deep to deep, loamy-skeletal soils moderate to severe erosion; <i>associated with:</i> Loamy soils with moderate erosion | 16312.34 |
| 19 | | Deep, loamy soils with moderate erosion and moderate stoniness; <i>associated with:</i> Medium, deep, loamy soils | 14375.67 |
| Total area | | | 652799.3 |



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

| Condition | Major Farming situatio | Normal Crop / Cropping system | Suggested Contingency measures | | |
|--------------------------------------|--|--|--|--|---------------------------|
| | | | Change in crop / cropping system including variety | Agronomic measures | Remarks on Implementation |
| Early season drought (delayed onset) | | | | | |
| Delay by 2 weeks | Brown Forest Shallow to moderately deep gravelly sandy loam to sandy clay loam Soils (Scarce rainfall) | Maize – Wheat | No Change | Normal Agronomic measures recommended by SAU | - |
| 2 nd week of July | | Paddy-wheat+ Sarson | | | |
| | | Maize/Blackgram/Rajmash – Wheat+sarson | | | |
| | | Vegetable- Vegetable | | | |

| Condition | Major Farming situation | Normal Crop / Cropping system | Suggested Contingency measures | | |
|--------------------------------------|--|-------------------------------|---|--|--|
| | | | Change in crop / cropping system including variety | Agronomic measures | Remarks on Implementation |
| Early season drought (delayed onset) | | | | | |
| Delay by 4 weeks | Brown Forest Shallow to moderately deep gravelly sandy loam to sandy clay loam Soils (Scarce rainfall) | Maize – Wheat | Maize: K-517, K-9451, K-25 and KH-2005 (K= Kanchan) Blackgram (Him-1, T-9) | <ul style="list-style-type: none"> Hand weeding Mulching between rows with weeds and grasses @5 t/ha | -Link SAU, NSC Department of agriculture and other seed firms to get good quality |
| 4 th week of July | | Paddy-Wheat+ Sarson | Paddy:RP-2421/ | | |

| | | | | | |
|--|--|---|---|--|---|
| | | Blackgram/ Rajmash | Blackgram: T-9 Rajmash: Jwala Intercropping with legumes like black gram (Him-1) | <ul style="list-style-type: none"> • Hand weeding • Mulching between rows with weeds and grasses @5 t/ha | seed Awareness and training campaigns by extension agencies KVK |
| | | Vegetable- Vegetable Pea- Tomato/Beans | No Change | <ul style="list-style-type: none"> • Hand weeding • Mulching between rows with weeds and grasses @5 t/ha | |
| | | Potato -Peas | Potato: Kufri Jayoti | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|------------------------------------|--|--|---|
| Early season drought (delayed onset) | Major Farming situation | Normal Crop / Cropping system | Change in crop / cropping system including variety | Agronomic measures | Remarks on Implementation |
| Delay by 6 weeks 2nd week of August | Brown Forest Shallow to moderately deep gravelly sandy loam to sandy clay loam Soils (Scarce rainfall) | Maize – Wheat | <ul style="list-style-type: none"> • Maize: K-517, K-9451, K-25 and KH-2005 (K= Kanchan) • Intercropping with legumes like blackgram cv. Him-1 | <ul style="list-style-type: none"> • Sowing of maize with 15-20% higher seed rate • Dry sowing of maize • Adopt closer spacing in • Mulching between rows with weeds and grasses @5 t/ha | Department of Agril, Awareness campaigns by extension agencies |
| | | Paddy-Wheat+ Sarson | Paddy:RP-2421 | <ul style="list-style-type: none"> • Adopt closer spacing in rice | |
| | | Blackgram/Rajmash – Wheat + Sarson | Blackgram: T-9 Rajmash: Jwala | <ul style="list-style-type: none"> • Sowing of maize with 15-20% higher seed rate • Adopt closer spacing • Dry sowing of maize • Intercropping with legumes like black gram • Mulching between rows with weeds and grasses @5 t/ha. | |

| | | | | | |
|--|--|---|----------------------|--|--|
| | | Vegetable- Vegetable Pea- Tomato/Beans | No Change | <ul style="list-style-type: none"> • Hand weeding • Mulching between rows with weeds and grasses @5 t/ha | |
| | | Potato - Peas | Potato: Kufri Jayoti | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|--|--|
| Early season drought (delayed onset) | Major Farming situation | Normal Crop / Cropping system | Change in crop / cropping system including variety | Agronomic measures | Remarks on Implementation |
| Delay by 8 weeks 4th week of August | Brown Forest Shallow to moderately deep gravelly sandy loam to sandy clay loam Soils (Scarce rainfall) | Maize – Wheat | Toria /Oats | <ul style="list-style-type: none"> •Sowing of Toria at 30 cm spacing and oats at 25 cm spacing . •Construction of rainwater harvesting structures i.e. LDPE farm ponds | Department of Agriculture, Department of Horticulture, NREGA, RKVY, Technology mission , Pt. DeenDayalUpadhay Yojna etc. |
| | | Paddy-wheat+ Sarson | Toria: DK-1 or Bhawani | | |
| | | Blackgram/Rajmash - Wheat+sarson | Oats: Palampur-1, Kent | | |
| | | Vegetable- Vegetable Pea- Tomato/Beans | Growing of marigold flowers (African Marigold) Marigold : Pusa Narangi | | |
| | | Potato - Peas | Toria /Oats Toria: DK-1 or Bhawani Oats: Palampur-1, Kent | | |

| Condition | | | Suggested Contingency measures | | |
|---|--|-------------------------------|--|---|--|
| Early season drought (Normal onset) | Major Farming situation | Normal Crop / Cropping system | Crop management | Soil nutrient and moisture conservation measures | Remarks on Implementation |
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop | Brown Forest Shallow to moderately deep gravelly sandy loam to sandy clay loam | Maize – Wheat | <ul style="list-style-type: none"> • Hand weeding in maize • Reduction in plant population by 10-15 % by thinning • Intercropping of blackgram cv. Him-1 or UG-218 in | <ul style="list-style-type: none"> •Mulching between rows with weeds and grasses @5 t/ha •Foliar spray of urea @ 0.5% | NREGA, RKVY, watersheds, Technology mission , Pt. DeenDayalUpadhay Yojna for the support of farm |

| | | | | | |
|-------------|-------------------------|--|---|---|-----------------|
| stand etc.) | Soils (Scarce rainfall) | | <p>poor germinated areas</p> <ul style="list-style-type: none"> • Re-sowing of maize where there is meager or no germination | <ul style="list-style-type: none"> • Construction of rainwater harvesting structures i.e. LDPE farm ponds | pond technology |
| | | Blackgram/Rajmash - Wheat+sarson | <ul style="list-style-type: none"> • Hand weeding in maize • Reduction in plant population by 10-15 % by thinning | | |
| | | Rice -wheat+ Sarson | <ul style="list-style-type: none"> • Hand weeding • Reduction in plant population by 10-15 % by thinning • Re-transplanting of rice where there is mortality | <ul style="list-style-type: none"> • Foliar spray of urea @ 0.5% to replace soil application • Construction of rainwater harvesting structures i.e. LDPE farm ponds | |
| | | Vegetable- Vegetable Pea- Tomato/Beans | <ul style="list-style-type: none"> • Sowing with early cultivars of pea like Arkel and Matarageta • Gap filling with new plants | <ul style="list-style-type: none"> • Mulching between rows with weeds and grasses @5 t/ha | |
| | | Potato - Peas Potato: KufriJayoti | <ul style="list-style-type: none"> • Hand weeding • Reducing plant population by 15% | <ul style="list-style-type: none"> • Foliar spray of urea @ 0.5% to replace soil application | |

| Condition | Major Farming situation | Normal Crop / Cropping system | Suggested Contingency measures | | |
|--|------------------------------------|--|--|---|---|
| | | | Crop management | Soil nutrient and moisture conservation measures | Remarks on Implementation |
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) | | | | | |
| At vegetative stage | Brown Forest Shallow to moderately | Maize/Blackgram/Rajmash - Wheat+sarson | <ul style="list-style-type: none"> • Hand weeding | <ul style="list-style-type: none"> • Mulching between rows with weeds and grasses @5 t/ha • Foliar spray of urea @ 0.5% | <ul style="list-style-type: none"> • LinkNREGA, RKVY, watersheds, Technology mission , Pt. |

| | | | | | |
|--|--|---|--|--|--|
| | deep gravelly sandy loam to sandy clay loam Soils (Scarce rainfall) | Paddy-wheat+ Sarson | <ul style="list-style-type: none"> • Interculture | | DeenDayalUpadhyayYojna for the support of farm pond technology <ul style="list-style-type: none"> • |
| | | Vegetable-Vegetable Pea-Tomato/Beans | <ul style="list-style-type: none"> • Gap filling with new seedlings in tomato | | |
| | | Potato - Peas Potato: KufriJayoti | <ul style="list-style-type: none"> • Hand weeding • Reducing plant population by 15% | | |

| Condition | | | Suggested Contingency measures | | |
|-------------------------------------|--|---|---|---|--|
| Mid season drought (long dry spell) | Major Farming situation | Normal Crop / Cropping system | Crop management | Soil nutrient and moisture conservation measures | Remarks on Implementation |
| At flowering/ fruiting stage | Brown Forest Shallow to moderately deep gravelly sandy loam to sandy clay loam Soils (Scarce rainfall) | Maize – Wheat Maize: K-517, K-9451, K-25 and KH-2005 (K= Kanchan) Wheat: Raj-3765 | <ul style="list-style-type: none"> •Foliar spray of urea @ 0.5% to replace soil application •Interculture | <ul style="list-style-type: none"> •Mulching between rows with weeds and grasses @5 t/ha •Construction of rainwater harvesting structures i.e. LDPE farm ponds •Life saving irrigation if possible | <ul style="list-style-type: none"> •LinkNREGA, RKVY, watersheds, Technology mission , Pt. Deen Dayal Upadhyay Yojna for the support of farm pond technology |
| | | Paddy-wheat+ Sarson | | | |
| | | Blackgram/Rajmash - Wheat+sarson | | | |
| | | Vegetable- Vegetable Pea- Tomato/Beans | | | |
| | | Potato - Peas Potato: KufriJayoti | | | |
| | | Fruit Based Apples Other temperate fruits Walnut and dry fruits Citrus Other fruits | | | |

| Condition | | | Suggested Contingency measures | | |
|--|--|---|---|---|---|
| Terminal drought (Early withdrawal of monsoon) | Major Farming situation | Normal Crop / Cropping system | Crop management | Rabi Crop Planning | Remarks on Implementation |
| | Brown Forest Shallow to moderately deep gravelly sandy loam to sandy clay loam Soils (Scarce rainfall) | Maize/ Blackgram/ Rajmash -Wheat+sarson | <ul style="list-style-type: none"> • Hand weeding in maize • Life saving irrigation | If damage is severe, plan for land preparation for early Gobhisarson var. Neelam or Raya variety RCC-4 or Brown sarson var. KBS-3 | <ul style="list-style-type: none"> • Providing improved species of fruit plants by the Department of Horticulture under Horticulture Technology Mission • Link NREGA, RKVY, watersheds, Technology mission , Pt. DeenDayalUpadhyayYojna for the support of farm pond technology • Link SAU,NSC and department of agriculture for good quality seed and KVK for training needs of farmers |
| | | Paddy-wheat+ Sarson | | | |
| | | Vegetable- Vegetable Pea- Tomato/Beans | <ul style="list-style-type: none"> • Life saving irrigation | <ul style="list-style-type: none"> • Sowing with early cultivars of pea like Arkel and Matarageta | |
| | | Potato -Peas Potato: Kufri Jayoti | | | |
| Fruit Based Apples Other temperate fruits Walnut and dry fruits Citrus Other fruits | <ul style="list-style-type: none"> • Spray of Ethephon @ 500 ml / 200 l water to enhance maturity • Clean basin cultivation by manual weeding or by spray of glyphosate @ 1 ml / l | <ul style="list-style-type: none"> • Planning for introducing drought tolerant fruit plants like Harar, Amla, Karonda, pomegranate, • In-situ planting of walnut and pecan • In-situ moisture conservation by preparing V-shaped micro- catchments and planting on apex. | | | |

2.1.2 Drought - Irrigated situation

| Condition | Suggested Contingency measures | | | | |
|------------------|---------------------------------------|------------------------------------|---------------------------------------|---------------------------|----------------------------------|
| | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| | | | | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|---|--|--------------------------------|---|---|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Delayed release of water in canals due to low rainfall | Khul, undulating lands and brown forest soils | Paddy (sub merged conditions) | Maize / Aerobic rice | Select short duration varieties of maize and aerobic rice | <ul style="list-style-type: none"> • Awareness campaigns by extension agencies • Installation of drip irrigation systems under Pt. DeenDayalUpadhyayojna and RKVY |
| | | Vegetables based Capsicum, Potato, French Bean, Cabbage, Chilli | Millets | Limited irrigation Alternate Furrow irrigation Drip irrigation Foliar application of urea@ 0.5 percent | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|---|---|---------------------------------|--|---|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Limited release of water in canals due to low rainfall | Khul, undulating lands and brown forest soils | Vegetable based Capsicum, Potato, French Bean, Cabbage, Chilli | Continue vegetable based system | Limited irrigation Alternate Furrow irrigation Drip irrigation | <ul style="list-style-type: none"> • Installation of drip irrigation systems under Pt. DeenDayalUpadhyayojna and RKVY • Awareness campaigns by extension agencies |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|---|-------------------------------|--------------------------------|---|---|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Non release of water in canals under delayed onset of monsoon in catchment | Khul, undulating lands and brown forest soils | Paddy (sub merged conditions) | Aerobic rice/ Millets | In-situ moisture conservation technologies Water harvesting, recycling of rain water Management of disease and insects pest | <ul style="list-style-type: none"> • Awareness campaigns by extension agencies • Provision of seed material and agrochemicals |

| Condition | | | Suggested Contingency measures | | |
|-----------|-------------------------|-----------------------------|--------------------------------|--------------------|------------------------------|
| | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| | | | | | by Department of Agriculture |

| Condition | | | Suggested Contingency measures | | |
|--|---|-------------------------------|---|--|--|
| | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | Khul, undulating lands and brown forest soils | Paddy (sub merged conditions) | Maize, Aerobic rice and vegetables (Tomato, chilli and Brinjal) | Limited irrigation Drip irrigation Spray 2% urea Control of insects and pests | <ul style="list-style-type: none"> • Awareness campaigns by extension agencies • Provision of seed material and agrochemicals by Department of Agriculture |

| Condition | | | Suggested Contingency measures | | |
|---|---|-------------------------------|---|---|--|
| | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Insufficient groundwater recharge due to low rainfall | Khul, undulating lands and brown forest soils | Paddy (sub merged conditions) | Maize, Aerobic rice and vegetables (Tomato, chilli and Brinjal) | Limited irrigation Hand weeding and mulching Spray 0.5% urea Drip irrigation Control of insects and pests | <ul style="list-style-type: none"> • Awareness campaigns by extension agencies • Provision of seed material and agrochemicals by Department of Agriculture |

2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

| Condition | Suggested contingency measure | | | |
|--|-------------------------------|--|--|---|
| | Vegetative stage | Flowering stage | Crop maturity stage | Post harvest |
| Continuous high rainfall in a short span leading to water logging Vegetables (Capsicum, Cabbage, Tomato, Beans, Cucurbits) | Provide drainage | Use of shade nets Grow crops in protected structures Provide drainage | Drain out Harvesting at physiological maturity Use stakes and avoid touching of fruits to the ground | Grade and pack after safe storage at pack and grading houses |
| Horticulture Fruit crops (Apple, Plum, Apricot, Pears, Nut and Dry fruits) | Provide drainage | Drain out excess water | Harvesting at physiological maturity | Grade and pack after safe storage at pack and grading house |
| Heavy rainfall with high speed winds in a short span² | - | - | - | - |
| Pea Tomato Beans Cucurbits Cauliflower | Provide drainage | Use of shade nets Grow crops under protected structures Provide drainage | Drain out Harvesting at physiological maturity Use of stakes for support | Grade and pack after safe storage at pack and grading houses |
| Horticulture Fruit crops (Apple, Plum, Apricot, Pears, Nut and Dry fruits) | Provide drainage | Drain out excess water Use of shade nets | Drain out Harvesting at physiological maturity | Grade and pack after safe storage from insect pest at pack and grading houses |
| Outbreak of pests and diseases due to unseasonal rains | - | - | - | - |

2.3 Floods

| Condition | Suggested contingency measure ^o | | | |
|--|--|------------------|--------------------|------------|
| | Seedling / nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Transient water logging/ partial inundation ¹ | | | | |
| Continuous submergence for more than 2 days ² | Not applicable | | | |
| Sea water intrusion ³ | | | | |

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone*

| Extreme event type | Suggested contingency measure ^r | | | |
|---------------------------------|--|---|--|---|
| | Seedling / nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Heat Wave | Not applicable | | | |
| Cold wave | | | | |
| Horticulture | | | | |
| Apple Other temperate fruits | Raise nursery plants in poly chambers | Light irrigation on foliage Heavy pruning during dormancy Coating of plants through tree spray oils | For improving fruit setting placement of bee hives Placement of pollenizer bouquets | Proper packing and grading of fruits for safe storage and transportation to destination APMC's |
| Frost | | | | |
| Pea Tomato | Grow seedling in low poly tunnels | Mist formation with light irrigation | Light irrigation | Removal of affected pods/fruits Proper packing & grading of fruits |
| Horticulture | | | | |
| Apple Mango Litchi | Use shade nets Light irrigation in evening period | Mist formation with light irrigation Use of foggers | Light irrigation | Removal of injured pods/fruits Proper packing & grading of fruits |
| Hailstorm | | | | |
| Pea Tomato Cucurbits | Use of anti hail nets | In hail prone areas grow these vegetable under shade net or in playhouses or | Use of shade nets to protect from hail injuries | Removal of injured pods/fruits Proper packing of graded fruits |

| | | | | |
|---------------------|-----------------------|-----------------------|--|---|
| cauliflower | | protected structures | Use of plant growth regulators for injury recovery | |
| Horticulture | | | | |
| Apple | Use of shade nets | Use of anti hail nets | Use of anti hail nets wherever feasible | Remove injured fruits Safe storage of graded fruit at pack house |
| Apricot | | | Use of plant growth regulators for injury filling | |
| Plum | | | | |
| | | | Use of anti hail guns wherever feasible | |
| Cyclone | Not applicable | | | |

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

| | Suggested contingency measures | | |
|-------------------------------|---|---|---|
| | Before the event ^s | During the event | After the event |
| Drought | | | |
| Feed and fodder availability | Collect crop residues, collect tree fodder, use mangers, use chaff cutters , hay storage , | Utilization of fodder from Perennial & reserve sources, Open grazing in forests and alpine slopes/ community lands and feeding of crop residues ; use of mangers and chaff cutters , feeding of household waste | Culling undesirable Livestock (sheep and goats) , Raising of fodder trees, replacement of unproductive animals with improved ones |
| Drinking water | Storage of water in tanks , Traditional water ponds , rivers | Utilization of stored water, Stall drinking , rivers , traditional water ponds | Rejuvenation of water sources |
| Health and disease management | Advance preparation with medicines and vaccination, Local ethno pharmaceutical and modern medicines | Treatment of affected livestock by mass campaign, Modern veterinary care , veterinary camps , insulation | Proper veterinary care , awareness , capacity building of locals, health care management |
| Floods | Not applicable | | |

| | | | |
|--------------------------------|--|--|---|
| Feed and fodder availability | | | |
| Drinking water | | | |
| Health and disease management | | | |
| Cyclone | Not applicable | | |
| Feed and fodder availability | | | |
| Drinking water | | | |
| Health and disease management | | | |
| Cold wave | | | |
| Shelter/environment management | Brought back from high hill pasture lands to nearby pastures ; restricted open grazing | Stationary conditions in cowsheds , group living, dry grass flooring, gunny bags on windows, gunny bags wrapped on the belly of milking animals , restricted open grazing during sunny days only | Open grazing, grazing in open sun , massage of milking animals and other species, hot water bath of animals |
| Health and disease management | Traditional herbs fed to animals | Warm living conditions, syrup of <i>lassi</i> (curd juice) after roasting fed to animals , avoid exposure to cold and rains/ snow. | Open grazing in sunny days and feeding of medicinal herbs . In case of acute problem , veterinary care |

2.5.2 Poultry (Backyard only)

| | Suggested contingency measures | | | Convergence/linkages with ongoing programs, if any |
|------------------------------|--|---|--|--|
| | Before the event ^a | During the event | After the event | |
| Drought | | | | |
| Shortage of feed ingredients | Surplus storage of poultry feed ; No special preparations as these are kept as backyard activity | Utilization of surplus feed; No impact as these is kept in captivity. Moreover these are kept as backyard and household waste is sufficient for their keeping | Kept as backyard activity Availing Insurance Culling affected birds | Collaboration with Directorate of Animal Husbandary |
| Drinking water | Storage of water in tanks | Utilize stored water | Kept as backyard activity and local drinking water is sufficient | Water storage structures can be constructed in collaboration with MNERAGA , HTM and other schemes of the Department of Rural Development |

| | | | | |
|--------------------------------|--|--|--|--|
| Health and disease management | Advance preparation with medicines and vaccination | Mass Vaccination, Locally managed with the help of veterinary care | Kept as backyard activity and local health care is practiced | Collaboration with Directorate of Animal Husbandry |
| Floods | Not applicable | Not applicable | Not applicable | Not applicable |
| Shortage of feed ingredients | | | | |
| Drinking water | | | | |
| Health and disease management | | | | |
| Cyclone | Not applicable | Not applicable | Not applicable | Not applicable |
| Shortage of feed ingredients | | | | |
| Drinking water | | | | |
| Health and disease management | | | | |
| Heat wave and cold wave | | | | |
| Shelter/environment management | Proper Ventilation and warm space | Proper aeration and fan , open spacing, water supply , warm space | Kept as backyard activity so no proper action is taken | Collaboration with Directorate of Animal Husbandry |
| Health and disease management | Local | Local and Veterinary care | Kept as backyard activity and local knowledge about veterinary care is practiced | |

2.5.3 Fisheries/ Aquaculture (It is a supportive activity only)

| | Suggested contingency measures | | |
|--|--------------------------------|-----------------------|-----------------------|
| | Before the event | During the event | After the event |
| 1) Drought | Not applicable | Not applicable | Not applicable |
| A. Capture | | | |
| Marine | | | |
| Inland | | | |
| (i) Shallow water depth due to insufficient rains/inflow | | | |
| (ii) Changes in water quality | | | |

| | | | |
|--|--|-----------------------|-----------------------|
| (iii) Any other | | | |
| B. Aquaculture | Not applicable | Not applicable | Not applicable |
| (i) Shallow water in ponds due to insufficient rains/inflow | | | |
| (ii) Impact of salt load build up in ponds / change in water quality | | | |
| (iii) Any other | | | |
| 2) Floods | Not applicable | Not applicable | Not applicable |
| A. Capture | No specific action is taken as it is a supporting activity only and fishes are collected from natural ponds, rivers only . | | |
| Marine | | | |
| Inland | | | |
| (i) No. of boats / nets/damaged | | | |
| (ii) No.of houses damaged | | | |
| (iii) Loss of stock | | | |
| (iv) Changes in water quality | | | |
| (v) Health and diseases | | | |
| B. Aquaculture | Not applicable | Not applicable | Not applicable |
| (i) Inundation with flood water | | | |
| (ii) Water contamination and changes in water quality | | | |
| (iii) Health and diseases | | | |
| (iv) Loss of stock and inputs (feed, chemicals etc) | | | |
| (v) Infrastructure damage (pumps, aerators, hutsetc) | | | |
| (vi) Any other | | | |
| 3. Cyclone / Tsunami | Not applicable | Not applicable | Not applicable |
| A.Capture | | | |
| Marine | | | |
| (i) Average compensation paid due to loss of fishermen lives | | | |
| (ii) Avg. no. of boats / nets/damaged | | | |

| | | | |
|--|-----------------------|-----------------------|-----------------------|
| (iii) Avg. no. of houses damaged | | | |
| Inland | | | |
| B. Aquaculture | | | |
| (i) Overflow / flooding of ponds | | | |
| (ii) Changes in water quality (fresh water / brackish water ratio) | | | |
| (iii) Health and diseases | | | |
| (iv) Loss of stock and inputs (feed, chemicals etc) | | | |
| (v) Infrastructure damage (pumps, aerators, shelters/hutsetc) | | | |
| (vi) Any other | | | |
| 4. Heat wave and cold wave | Not applicable | Not applicable | Not applicable |
| A. Capture | | | |
| Marine | | | |
| Inland | | | |
| B. Aquaculture | Not applicable | Not applicable | Not applicable |
| (i) Changes in pond environment (water quality) | | | |
| (ii) Health and Disease management | | | |
| (iii) Any other | | | |

- No specific action is taken as it is a supporting activity only and fishes are collected from natural ponds, rivers only.