

State: Jammu and Kashmir

Agriculture Contingency Plan for District: Leh

| 1.0 District Agriculture profile | | | | |
|---|--|--|--------------------------------------|----------|
| 1.1 | Agro-Climatic/Ecological Zone | | | |
| | Agro Ecological Sub Region (ICAR) | Western Himalayas, Cold Arid Eco-Regions (1.1) | | |
| | Agro-Climatic Zone (Planning Commission) | Western Himalayan Region (I) | | |
| | Agro Climatic Zone (NARP) | Cold Arid Region (JK-4) | | |
| | List all the districts or part thereof falling under the NARP Zone | Leh and Kargil | | |
| | Geographic coordinates of district headquarters | Latitude | Longitude | Altitude |
| | | 32 ⁰ to 36 ⁰ N | 75 ⁰ to 80 ⁰ E | 11782 ft |
| | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | Sher-e- Kashmir University of Agricultural Sciences and Technology of Kashmir, RARS, Leh | | |
| Mention the KVK located in the district | KVK, Leh. | | | |

| 1.2 | Rainfall | Normal RF(mm) | Normal Rainy days (number) | Normal Onset (specify week and month) | Normal Cessation (specify week and month) |
|------------|---|----------------------|-----------------------------------|---|--|
| | No concept of SW and NE Monsoon. Precipitation in the form of Snow and Rain | 86.8 | Irregular | Nov to March (S) May – Sep. - Irregular (R) | Irregular |
| | Precipitation Snow (S), Rain (R) | | | | |
| | (Feb. –March) | 17mm (S) | | | |

| | | | | |
|--------------|------------|--|--|--|
| (June –July) | 19.4mm (R) | | | |
| Annual | 86.8mm | | | |

| 1.3 | Land use pattern of the district (latest statistics) | Geographical area ('000 ha) | Cultivable area ('000 ha) | Forest area ('000 ha) | Land under non-agricultural use ('000 ha) | Permanent Pastures ('000 ha) | Cultivable wasteland ('000 ha) | Land under Misc. tree crops and groves ('000 ha) | Barren and uncultivable land ('000 ha) | Current Fallows ('000 ha) | Other fallows ('000 ha) |
|-----|--|-----------------------------|---------------------------|-----------------------|---|------------------------------|--------------------------------|--|--|---------------------------|-------------------------|
| | Area ('000 ha) | 45.167 | 10.156 | 0.0 | 2.908 | 1.092 | 4.410 | 1.147 | 25.163 | 0.146 | 0.198 |

| 1.4 | Major Soils | Area ('000 ha) | Percent (%) of total |
|-----|-------------|----------------|----------------------|
| | Sandy loam | - | Majority of area |
| | Silt clay | - | Very limited area |
| | Clay loam | - | Very limited area |

| 1.5 | Agricultural land use | Area ('000 ha) | Cropping intensity % |
|-----|--------------------------|----------------|----------------------|
| | Net sown area | 10.103 | 100.5 % |
| | Area sown more than once | 0.413 | |
| | Gross cropped area | 10.156 | |

| 1.6 | Irrigation | Area ('000 ha) |
|-----|----------------------|----------------|
| | Net irrigated area | 10.103 |
| | Gross irrigated area | 10.516 |
| | Rainfed area | 0.0 |

| Sources of Irrigation | Number | Area ('000 ha) | % of total irrigated area |
|--|-------------------------------|-----------------|--|
| Canals/Small Canals | | 10.193 | 100 % |
| Tanks | | | |
| Open wells | | | |
| Bore wells | | | |
| Lift irrigation schemes | | | |
| Micro-irrigation | | | |
| Other sources (please specify) | | | |
| Total Irrigated Area | | 10.193 | 100 % |
| Pump sets | | | |
| No. of Tractors | | | |
| 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 | | | |

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

1.7 Area under major field crops & horticulture (2008-2009)

| 1.7a | Major field crops cultivated | Area ('000 ha) | | | | | | | Summer | Grand total |
|------|------------------------------|----------------|---------|-------|-------------|---------|-------|---|--------|-------------|
| | | <i>Kharif</i> | | | <i>Rabi</i> | | | | | |
| | | Irrigated | Rainfed | Total | Irrigated | Rainfed | Total | | | |
| | Barley | 0.076 | - | - | - | - | - | - | - | |
| | Wheat | 2.634 | - | - | - | - | - | - | - | |
| | Pulses | 0.306 | - | - | - | - | - | - | - | |

| | | | | | | | | | |
|--|-----------------|-------|---|---|---|---|---|---|---|
| | Oil seed | 0.086 | - | - | - | - | - | - | - |
| | Millets | 0.303 | - | - | - | - | - | - | - |
| | Alfalfa | 2.028 | | - | - | - | - | - | - |

| | | | | |
|-------------|------------------------------------|--------------|------------------|--------------------------|
| 1.7b | Horticulture crops - Fruits | | | |
| | | Total | Irrigated | Rainfed ('000 ha) |
| | Apricot | 0.777 | 0.777 | - |
| | Apple | 0.608 | 0.608 | - |
| | Walnut | 0.051 | 0.051 | - |
| | Pear | 0.002 | 0.246 | - |
| | Peach | 0.004 | 0.004 | - |

| | | | | |
|-------------|--|-----------------------------|---------------------------------|-------------------------------|
| 1.7c | Horticulture crops - Vegetables | | | |
| | | Total area ('000 ha) | Irrigated area ('000 ha) | Rainfed area ('000 ha) |
| | Potato | 0.370 | 0.370 | - |
| | Cabbage | 0.125 | 0.125 | - |
| | Peas | 0.140 | 0.140 | - |
| | Cauliflower | 0.090 | 0.090 | - |
| | Radish, Turnip | 0.050 | 0.050 | - |
| | Onion, Tomato, Cucurbits | 0.085 | 0.085 | - |

| | | | | |
|-------------|-------------------------------------|-----------------------------|---------------------------------|-------------------------------|
| 1.7d | Medicinal and Aromatic crops | Total area ('000 ha) | Irrigated area ('000 ha) | Rainfed area ('000 ha) |
| | Medicinal and Aromatic crops | N. A | | |
| 1.7e | Plantation crops | Total area ('000 ha) | Irrigated area ('000 ha) | Rainfed area ('000 ha) |
| | | N. A | | |
| 1.7f | Fodder crops | Total area ('000 ha) | Irrigated area ('000 ha) | Rainfed area ('000 ha) |
| 1 | Lucerne (Alf-Alf) | 0.198 | 0.198 | - |
| 1.7g | Grazing/Pasture land | 1.058 | 1.058 | - |
| 1.7h | Sericulture etc | - | - | - |
| 1.7i | Others (specify) | | | |

| | | | | | | |
|--|---|-------------------------------|----------------------------------|--------------------------|-------------------------------|---|
| 1.8 | Livestock (in number) | Male ('000) | Female ('000) | Total ('000) | | |
| | Non descriptive Cattle (local low yielding) | | | 9.495 | | |
| | Crossbred cattle (Crossbred + Local) | | | 36.231 | | |
| | Non descriptive Buffaloes (local low yielding) | | | - | | |
| | Graded Buffaloes | | | - | | |
| | Goat | | | 219.0 | | |
| | Sheep | | | 102.4 | | |
| | Others (Camel, Yak etc.) | | | 29.7 | | |
| | Commercial dairy farms (Number) | | | - | | |
| 1.9 | Poultry | No. of farms | Total No. of birds ('000) | | | |
| | Commercial | - | - | | | |
| | Backyard (Local) | | 10.7 | | | |
| 1.10 | Fisheries (Data source: Chief Planning Officer of district) | | | | | |
| | A. Capture | | | | | |
| | i) Marine (Data Source: Fisheries Department) | No. of fishermen | Boats | | Nets | Storage facilities (Ice plants etc.) |
| | | | Mechanized | Non-mechanized | | |
| | | | | | | |
| | ii) Inland (Data Source: Fisheries Department) | No. Farmer owned ponds | | No. of Reservoirs | No. of village tanks | |
| | | | | | | |
| | 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 (Average of last 5 years: 2004, 05, 06, 07, 08; specify years)

| 1.11 | Name of crop | <i>Kharif</i> | | <i>Rabi</i> | | Summer | | Total | | Crop residue as fodder ('000 tons) |
|--|-----------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|------------------------------------|
| | | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | |
| Major Field crops (Crops to be identified based on total acreage) | | | | | | | | | | |
| | Barley | 6.600 | 1487 | - | - | - | - | 6.600 | 1487 | - |
| | Wheat | 4.360 | 1469 | - | - | - | - | 4.360 | 1469 | - |
| | Pulses | 0.150 | 585 | - | - | - | - | 0.150 | 585 | - |
| | Oil seed | 0.120 | 620 | - | - | - | - | 0.120 | 620 | - |
| | Millets | 0.040 | 200 | - | - | - | - | 0.040 | 200 | - |
| Others | | | | - | - | - | - | - | - | - |
| Major Horticultural crops (Crops to be identified based on total acreage) | | | | | | | | | | |
| | Apricot | 3.140 | 4048.14 | - | - | - | - | 3.130 | 4048.14 | - |
| | Apple | 3.820 | 6276.75 | - | - | - | - | 3.820 | 6276.75 | - |
| | Walnut | 0.114 | 2188.73 | - | - | - | - | 0.112 | 2188.73 | - |
| | Pear | 0.008 | 37.290 | - | - | - | - | 0.008 | 37.290 | - |
| | Peach | 0.007 | - | - | - | - | - | 0.007 | - | - |
| | Grapes | - | - | - | - | - | - | - | - | - |

| 1.12 | Sowing window for 5 major field crops (start and end of normal sowing period) | Barley | Wheat | Pulses | Oil Seeds | Millets |
|------|---|-------------|--------------|--------------|--------------|---------|
| | <i>Kharif</i> - Rainfed | - | - | - | - | - |
| | <i>Kharif</i> -Irrigated | May to June | April to May | April to May | April to May | August |

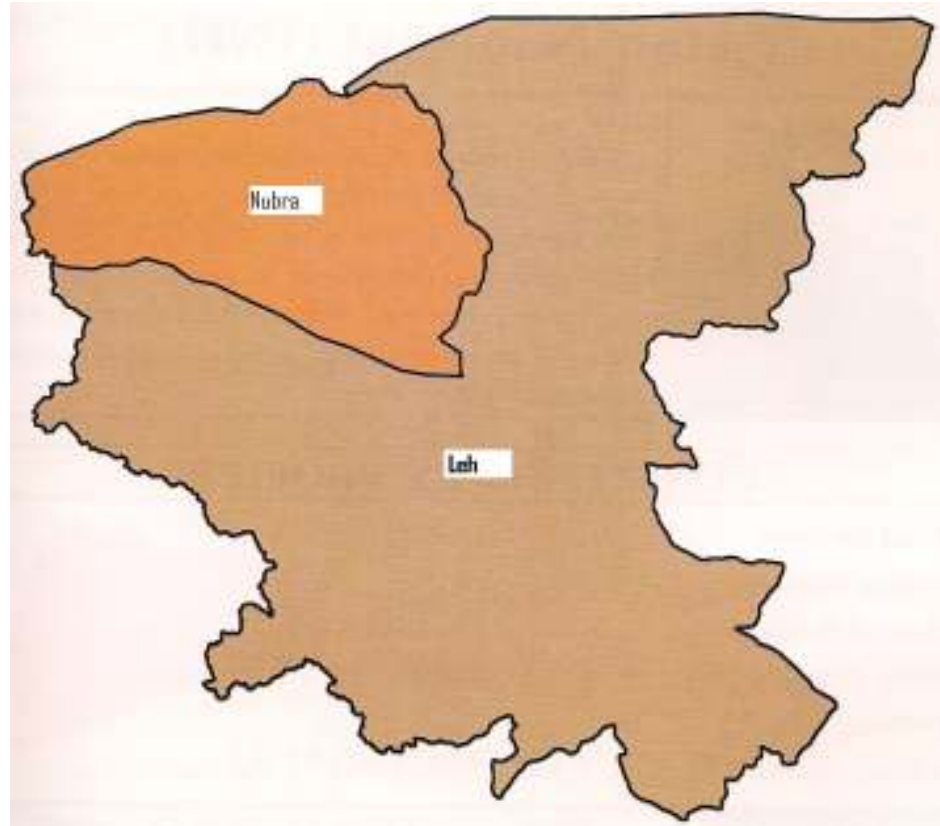
| | | | | | | |
|-------------|--|---|---|----------------|--------------------|-------------|
| | <i>Rabi</i> - Rainfed | - | - | - | August (IInd Crop) | - |
| | <i>Rabi</i> -Irrigated | - | - | - | - | - |
| 1.13 | What is the major contingency the district is prone to? (Tick mark) | | | Regular | Occasional | None |
| | Drought | | | | ✓ | |
| | Flood | | | | | ✓ |
| | Cyclone | | | | | ✓ |
| | Hail storm | | | | | ✓ |
| | Heat wave | | | | | ✓ |
| | Cold wave | | | ✓ | - | - |
| | Frost | | | ✓ | | |
| | Sea water intrusion | | | | | ✓ |
| | Pests and disease outbreak (specify) | | | | ✓ | - |
| | Others (specify) Locusts, Codling moth Aphids | | | ✓ | | |

6 out of 10 years = Regular

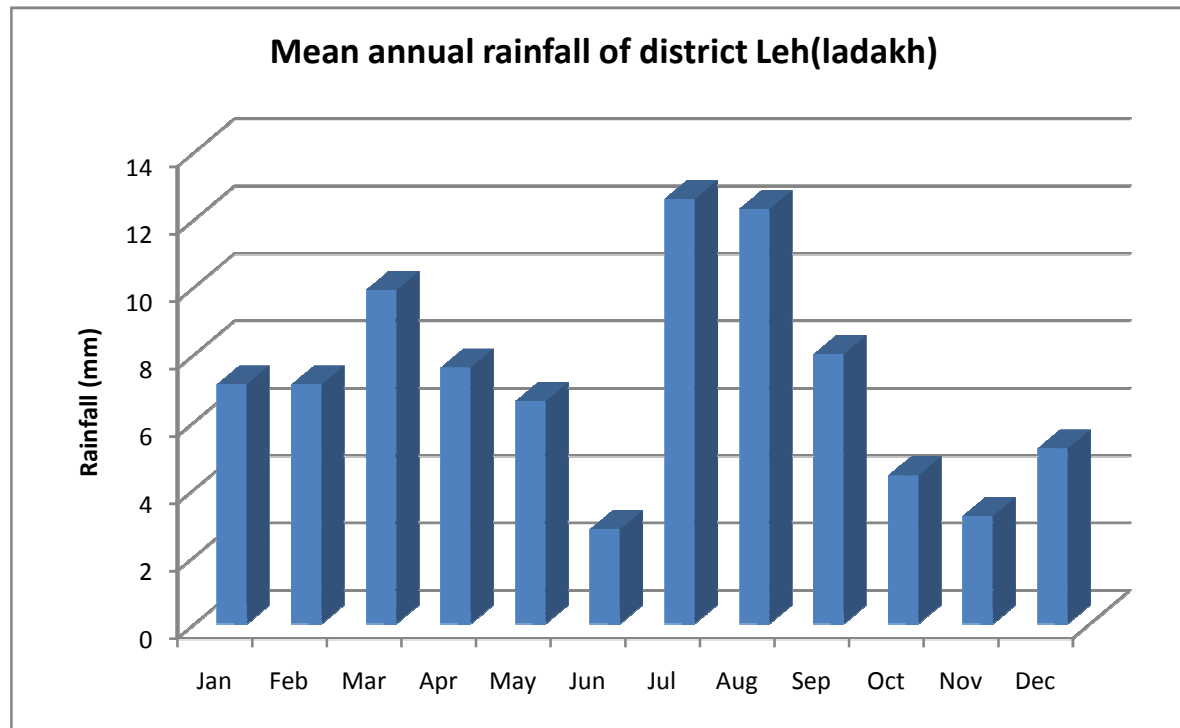
| | | | |
|-------------|---|---|---------------|
| 1.14 | Include Digital maps of the district for | Location map of district within State as Annexure I | Enclosed: Yes |
| | | Mean annual rainfall as Annexure 2 | Enclosed: Yes |
| | | Soil map as Annexure 3 | Enclosed: No |

Annexure I

Map of Leh



Annexure II



2.0 Strategies for weather related contingencies

2.1 Drought (N. A)

2.1.1 Rainfed situation

| 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 |
| There is no rainfed agriculture in Leh (Ladakh) district as annual rainfall (including snow) is only 86.8 mm | | | | | |
| Condition | | | Suggested Contingency measures | | |
| Early season drought (delayed onset) | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| NA | | | | | |

| Condition | | | Suggested Contingency measures | | |
|--------------------------------------|-------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
| Early season drought (delayed onset) | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| NA | | | | | |

| Condition | | | Suggested Contingency measures | | |
|--------------------------------------|-------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
| Early season drought (delayed onset) | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| NA | | | | | |

| Condition | | | Suggested Contingency measures | | |
|-------------------------------------|--------------------------------------|--|--------------------------------|---|---------------------------|
| Early season drought (Normal onset) | Major Farming situation ^a | Normal Crop/cropping system ^b | Crop management ^c | Soil nutrient & moisture conservation measures ^d | Remarks on Implementation |

NA

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|-------------------------|-----------------------------|--------------------------------|---|---------------------------|
| | | | Crop management | Soil nutrient & moisture conservation measues | Remarks on Implementation |
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) | | | | | |
| NA | | | | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|-------------------------------------|-------------------------|-----------------------------|--------------------------------|--|---------------------------|
| | | | Crop management | Soil nutrient & moisture conservation measrues | Remarks on Implementation |
| Mid season drought (long dry spell) | | | | | |
| NA | | | | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|-------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
| | | | Crop management | Rabi Crop planning | Remarks on Implementation |
| Terminal drought (Early withdrawal of monsoon) | | | | | |
| NA | | | | | |

2.1.2 Drought - Irrigated situation

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|-----------|-------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
| | | | 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 temperature & melt of glaciers | Sandy loam soil along Glacier melt streams Mid altitudes | a. Wheat-Fallow b. Barley -Fallow c. Alfalfa d. Pulses | Change not recommended | Pre-sowing irrigation, Repair of water reservoirs | |
| | Sandy loam soil Low altitude | a. Wheat-Buckwheat b. Barley-Buckwheat c. Potato d. Alfalfa e. Pulses | Change not recommended | Reduced tillage, Repairs of irrigation canals & reservoirs | |
| Condition | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Limited release of water in canals due to low rainfall/charging of glaciers | | a. Wheat-Fallow b. Barley –Fallow c. Alfalfa | Alfalfa-fallow Barley-fallow Wheat-fallow | Local varieties, Mulching, Reduce N fertilization, Increase use of organics | |
| | | a. Wheat-Buckwheat b. Barley-Buckwheat c. Potato d. Alfalfa | Alfalfa-fallow Barley-fallow Wheat-fallow | Local varieties, Mulching, Reduce N fertilization, Increase use of organics | |

| 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 | | a. Wheat-Fallow b. Barley -Fallow c. Alfalfa d. Trench vegetables | NA | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|----------------------|-------------------------|--|--------------------------------|--------------------|---------------------------|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| monsoon in catchment | | a. Wheat-Buckwheat b. Barley-Buckwheat c. Potato d. Alfalfa | | NA | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|-------------------------|--|--------------------------------|--------------------|---------------------------|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | | Cropping System:1 | | NA | |
| | | a. Wheat-Fallow b. Barley -Fallow c. Alfalfa d. Pulses | | | |
| | | a. Wheat-Buckwheat b. Barley-Buckwheat c. Potato d. Alfalfa | | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|-------------------------|---|--------------------------------|--|---------------------------|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Insufficient groundwater recharge(Spring) due to low precipitation on glaciers | | a. Wheat-Fallow b. Barley -Fallow c. Alfalfa d. Pulses | Wheat Barley Alfalfa | Local varieties, Mulching, Reduce N fertilization, Increase use of organics | |

| Condition | Suggested Contingency measures | | | | |
|-----------|--------------------------------|---|--------------------------------|--|---------------------------|
| | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| | | a. Wheat-Buckwheat b. Barley-Buckwheat c. Potato d. Alfalfa e. Pulses | Wheat Barley Alfalfa | Local varieties, Mulching, Reduce N fertilization, Increase use of organics | |

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 | NA | | | |
| Heavy rainfall with high speed winds in a short span ² | NA | | | |
| Outbreak of pests and diseases due to unseasonal rains | | | | |
| Wheat | Need based plant protection IPDM for crops | Need based plant protection IPDM for crops | | Safe storage against storage pest and diseases |
| barley | | | | |
| buckwheat | | | | |
| | | | | |

2.3 Floods : Not experienced / encountered

| Condition | Suggested contingency measure | | | |
|--|-------------------------------|------------------|--------------------|------------|
| | Seedling / nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Transient water logging/ partial inundation ¹ | | | | |
| Crop1 (specify) | NA | NA | NA | NA |

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone : Not experienced / encountered

| Extreme event type | Suggested contingency measure | | | |
|--------------------|-------------------------------|------------------|--------------------|------------|
| | Seedling / nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Heat Wave | | | | |
| Cold wave | | | | |
| Frost | | | | |
| Hailstorm | | | | |
| Cyclone | | | | |
| Horticulture | | | | |

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

| | Suggested contingency measures | | |
|------------------------------|--|---|-----------------|
| | Before the event | During the event | After the event |
| Drought | | | |
| Feed and fodder availability | Arrange and Store hay in bulk - Use excessive fodder for making hay | -Use urea molasses treated roughage -Use feed blocks prepared from crop residue -Ensure availability of mineral mixture | |
| Drinking water | Ensure storage of drinking water in storage tanks | Ensure storage of water | |

| | | | |
|--------------------------------|---|--|--|
| Health and disease management | Arrangement and preparedness with required medicine stock | Vaccination for foot and mouth disease and other required dosage and vaccination if not done earlier | Culling sick and unproductive livestock. |
| Floods | | | |
| Cyclone | | | |
| Heat wave and cold wave | | | |
| Shelter/environment management | Provide heating and proper ventilation | Ensure live stock is not subjected to direct cold | |
| Health and disease management | | | |

⁵ based on forewarning wherever available

2.5.2 Poultry

| | 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 | Ensure stock of feed | Utilize stored feed | Culling of affected birds | |
| Drinking water | Storage in water reservoirs | Use stored water | - | |
| Health and disease management | Preparedness and arrangement of vaccination | Mass vaccination | Culling of diseased birds | |
| Floods | | | | |
| Cyclone | | | | |
| Heat wave and cold wave | | | | |

^a based on forewarning wherever available

2.5.3

Fisheries/ Aquaculture

| | Suggested contingency measures | | |
|-----------------------------------|--|--|-----------------|
| | Before the event ^a | During the event | After the event |
| 1) Drought | | | |
| A. Capture | Prepare additional water reservoirs and exigency ponds | <ul style="list-style-type: none"> • Protect brood stock by making deep trenches in the middle of ponds. • Provide aeration • Stop feeding/restrict feeding | |
| B. Aquaculture | | | |
| 2) Floods | | | |
| A. Capture | | | |
| B. Aquaculture | | | |
| 3. Cyclone / Tsunami | | | |
| A. Capture | | | |
| B. Aquaculture | | | |
| 4. Heat wave and cold wave | | | |
| A. Capture | | | |
| B. Aquaculture | | | |

^a based on forewarning wherever available