

**State: Uttarakhand**

**Agriculture Contingency Plan for District: Chamoli**

<b>1.0</b>	<b>District Agriculture profile</b>		
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>		
	Agro Ecological Sub Region (ICAR)	Western Himalayas, Warm Subhumid (To Humid With Inclusion Of Perhumid) Eco-Region 14.2	
	Agro-Climatic Region (Planning Commission)	West Himalayan Region (I)	
	Agro Climatic Zone (NARP)	Hill zone (UP-1)	
	List all the districts falling under the NARP Zone	Haridwar, Nainital, Almora, Bageshwar, Champawat, Pithoragarh, Pauri, Tehari, Uttarkashi, Dehradun, Chamoli, Rudraprayag	
	Geographic Coordinates of district	Latitude	Longitude
		North Latitude 29 ° 55' 00" & 31° 03'	East Longitude 79 ° 02' 39" & 80° 03' 29"
	Name and address of the concerned ZRS/ZARS/RARS/RRS/ RRTTS	Dr A K Singh, Zonal Project Director, GT Road, Rawatpur, Near Vikas Bhawan, Kanpur 0512-2550927(O)	
	Mention the KVK located in the district	Dr. Uma Naulia, Krishi Vigyan Kendra, Village-Gwaldam, Block-Tharali, District-Chamoli, Phone No: 9411171943, 01363-274287 email: kvkchamoli@rediffmail.com	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Dr H S Kushwaha, Professor, Agro meteorology, GBPUA&T, Pantnagar-263145 U S Nagar (UK) India	

<b>1.2</b>	<b>Rainfall</b>	<b>Average (mm)</b>	<b>Normal Onset ( week and month)</b>	<b>Normal Cessation (week and month)</b>
	SW monsoon (June-Sep):	776.5	2 <sup>nd</sup> week of June	3 <sup>rd</sup> week of September
	NE Monsoon(Oct-Dec):	74.0	4 <sup>th</sup> week of November	4 <sup>th</sup> week of December
	Winter (Jan- March)	213.3		
	Summer (Apr-May)	104.5		
	Annual:	1168.3		

<b>1.3</b>	<b>Land use pattern of the district</b>	Total geographical area	Forests	Land under non-agri.use	Permanent pastures	Land under misc. tree crops & groves	Barren & uncultivable land	Current fallow	Other fallows
	Area ('000 ha)	847.9	506.1	8.1	49.7	41.0	158.6	0.8	1.4

[http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook\\_.pdf](http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook_.pdf)

<b>1. 4a</b>	<b>Description of Soils</b>	<b>Area ('000 ha)</b>	<b>% Area</b>
	Medium deep, loamy soils		
	Medium deep, loamy-skeletal soils		
	Deep loamy soils		
	<b>Total Area</b>		

<b>1. 4b</b>	<b>Major Soil types</b>	<b>Area ('000 ha)</b>	<b>% Area</b>
	Brown Forest Soil		
	Red to Dark soil		
	Black Clay		

<b>1.5</b>	<b>Sown area ('000 ha)</b>		
	Net sown area	29.5	Cropping intensity % 150.8%
	Area sown more than once	15.0	
	Gross cropped area	44.5	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>	<b>Percent</b>
	Gross irrigated area	03	10%
	Net irrigated area	02	5%
	Rainfed area	33	95%

Sources of irrigation	Canals	Tanks & other minor irrigations	Open Wells	Borewell/tube wells	Others
Area ('000 ha)	0.8				2.28
Percent	26.33%				73.67%

[http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook\\_.pdf](http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook_.pdf)

1.7 Area under major field crops	Total Area ('000 ha)			
	Kharif	Rabi	Summer	Total
<b>Crop</b>				
Wheat		14.2		14.2
Paddy	11.3			11.3
Mandua	7.7			7.7
Jhingora	2.5			2.5
Potato		2.4		2.4
<b>Vegetable crops</b>	<b>Area ('000 ha)</b>			
	<b>Total</b>			
Potato	2.4			
Pea	0.3			
Cabbage	0.3			
Onion	0.3			
French bean	0.2			
Tomato	0.3			
Cauliflower	0.2			
Brinjal	0.2			
Bhendi	0.1			
Capsicum	0.1			
Others	0.2			
<b>Horticulture crops</b>	<b>Area ('000 ha)</b>			
	<b>Total</b>			
Apple	3.4			
Pear	0.3			
Peach	0.7			
Plum	0.2			
Apricot	0.1			
Walnut	0.8			

Citrus	6.3		
Mango	0.4		
Others	0.3		
<b>Sericulture</b>			
<b>Medicinal and Aromatic crops</b>			
<b>Plantation crops</b>			
<b>Grazing lands (ha)</b>			
<b>Fodder crops</b>	<b>Area ('000 ha) Not available</b>		
	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	-	-	-

[http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook\\_.pdf](http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook_.pdf)

<b>1.8</b>	<b>Livestock</b>	<b>Number ( '000)</b>
	Cattle	173.0
	Buffaloes	55.2
	Commercial dairy farms	
	Goat	78.2
	Sheep	45.7
	Others (Camel, Pig, Yak)	0.4 0.01
<b>1.9</b>	<b>Poultry</b>	18.9
	Commercial	3
	Backyard	14
<b>1.10</b>	<b>Inland Fisheries</b>	
	Brackish water	
	Fresh water	
	Others	

<b>1.11</b>	<b>Production and Productivity of 5 major crops</b>	<b>Kharif</b>		<b>Rabi /</b>		<b>Summer</b>		<b>Total</b>	
		<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>
	Wheat	-	-	0.184	1297	-	-	0.184	1297

Paddy	0.168	1356	-	-	-	-	0.168	1356
Mandua	0.180	1503	-	-	-	-	0.180	1503
Potato	0.238	10300	-	-	-	-	0.238	10300
Jhingora	0.054	1511	-	-	-	-	0.054	1511
<b>Production and Productivity of 5 major <u>Vegetable</u> crops</b>	<b>Total Area ('000 ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>				<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>
Tomato	0.263	3.150	12000				3.150	12000
Cabbage	0.313	3.762	12000				3.762	12000
Cauliflower	0.189	2.274	12000				2.274	12000
Brinjal	0.167	2.010	12000				2.010	12000
Capsicum	0.071	0.365	5000				0.365	5000
Pea	0.318	2.544	8000				2.544	8000
French bean	0.207	1.245	6000				1.245	6000
Bhendi	0.121	0.726	6000				0.726	6000
Onion	0.291	2.326	8000				2.326	8000
Potato	2.367	36.309	15340				36.309	15340
Others	0.207	1.863	9000				1.863	9000
<b>Production and Productivity of 5 major <u>Horticulture</u> crops</b>	<b>Total Area ('000 ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>				<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>
Apple	3.383	21.871	6460				21.871	6460
Pear	0.316	2.965	9380				2.965	9380
Peach	0.701	5.782	7390				5.782	7390
Plum	0.241	2.012	8350				2.012	8350
Apricot	0.118	0.826	7000				0.826	7000
Walnut	0.794	4.793	6090				4.793	6090
Citrus	6.268	49.233	7850				49.233	7850
Mango	0.346	2.575	7440				2.575	7440
Others	0.343	2.789	8130				2.789	8130
<b>Production and Productivity of 5 major <u>Spices</u></b>	<b>Total Area ('000 ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>				<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>

Zinger	0.154	1.540	10000				1.540	10000
Turmeric	0.089	0.890	10000				0.890	10000
Coriander	0.048	0.123	2500				0.123	2500
Chilli	0.091	0.130	1500				0.130	1500
Garlic	0.110	0.812	7000				0.812	7000
Cardamon	0.018	0.0018	100				0.0018	100
Others	0.025	0.175	7000				0.175	7000
<b>Production and Productivity of major Flowers</b>	<b>Total Area ('000 ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>				<b>Production ('000 t)</b>	<b>Productivity (kg/ha)</b>
Gainda	0.0115	0.0116	10300				0.0116	10300
Gladiolus	0.0057	0.0058	10300				0.0058	10300
Dahlelia	0.0056	0.0057	10300				0.0057	10300
Rose	0.0549	0.0566	10300				0.0566	10300
Others	0.0077	0.0069	9000				0.0069	9000
<b>1.12 Sowing window (start and end of sowing period)</b>	<b>Rice</b>		<b>Potato</b>	<b>Finger millet</b>		<b>Ramdana</b>	<b>Horse gram</b>	
Kharif- Rainfed	Fourth week of May to fourth week of June		Second week of February to April	4 <sup>th</sup> week of May to 2 <sup>nd</sup> week of June		June	May-June	
Kharif-Irrigated	Fourth week of May to fourth week of June							
	<b>Wheat</b>		<b>Lentil</b>	<b>Toria</b>				
Rabi- Rainfed	October-November		October	October				
Rabi-Irrigated								

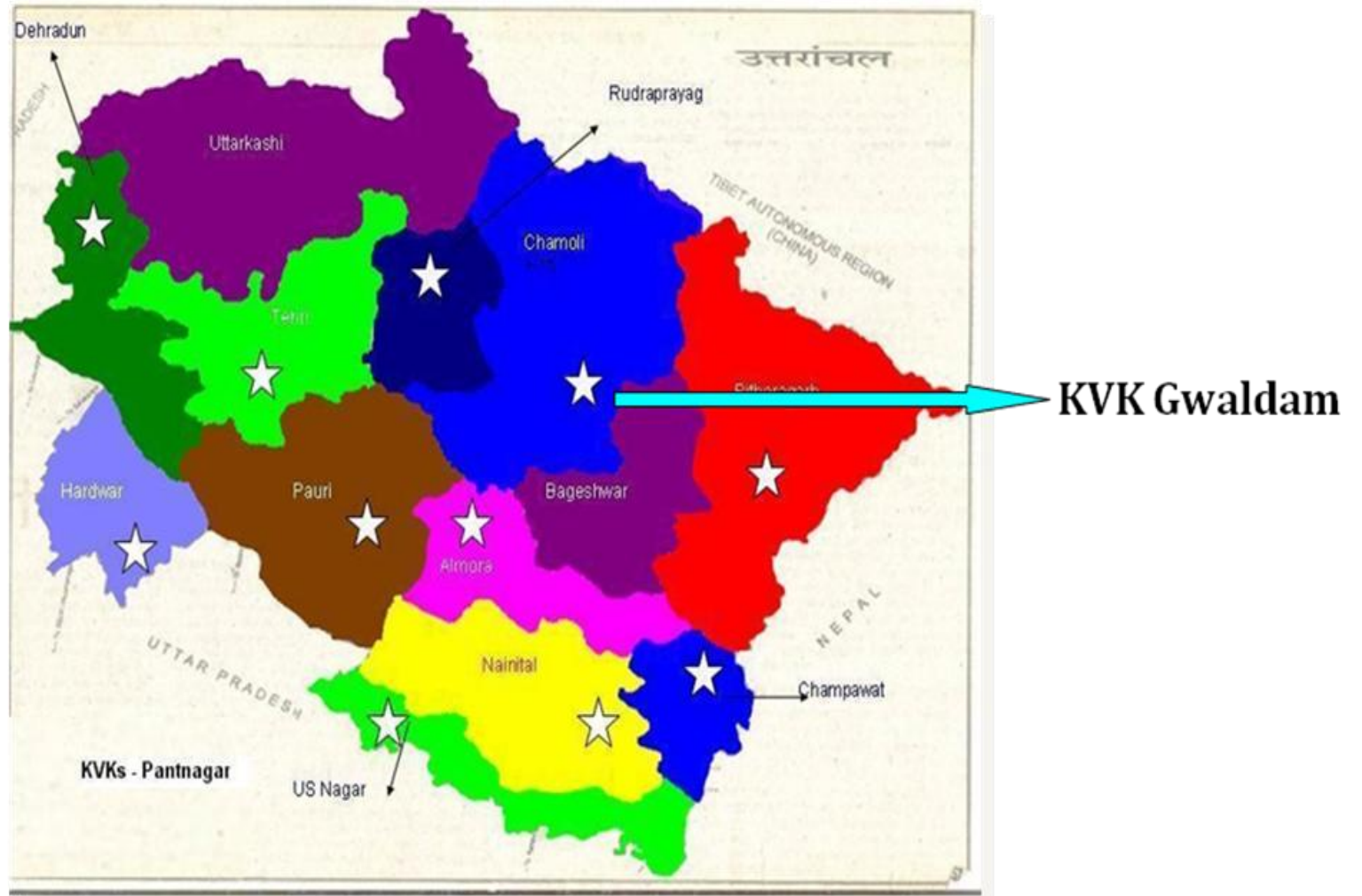
[http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook\\_.pdf](http://chamoli.nic.in/files/StatisticalHandbook%20/StatisticalHandbook_.pdf)

1.13	What is the major contingency the district is prone to? (Tick mark)			
		Regular	Occasional	None
Drought	-	√ (March-May) & (Oct-Nov)		
Flood	-	√ (June-Sept)		
Cyclone	-			√
Hail storm	√			

		(March-May)	
	Heat wave		√
	Cold wave	√ (Oct.-Feb.)	
	Frost	√ (Dec.-Feb.)	
	Sea water inundation		
	Pests and diseases	√ (June-Sept)	

<b>1.14</b>	<b>Include Digital maps of the district for</b>	Location map of district with in State as Annexure I	Enclosed : Yes
		Mean annual rainfall as Annexure 2	Enclosed : Yes
		Soil map as Annexure 3	Enclosed :

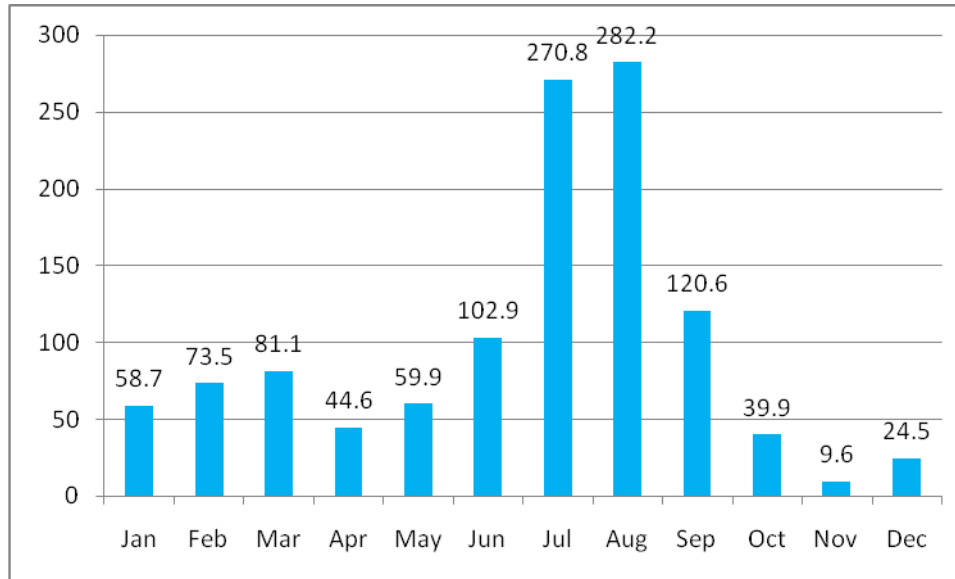
Annexure 01 : Location map of the Uttarakhand state and district Chamoli





**Annexure 02 : Mean annual rainfall (mm) of district Chamoli**

District : CHAMOLI



Note : (1) The District Rainfall(mm.)(R/F) shown below are the arithmetic averages of Rainfall of Stations under the District.

(2) % Dep. are the Departures of rainfall from the long period averages of rainfall for the District.

(3) Blank Spaces show non-availability of Data.

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.
2008		4.8 -89	163.8 59	354.0 31	273.2 -3	87.2 -28	31.3 -22	15.3 59	13.0 -47			
2009			32.2 -69	232.2 -14	124.5 -56	131.6 9	35.6 -11	6.6 -31	0.0 -100			
2010	0.0 -100	33.5 -54	17.8 -78	27.7 -38	63.9 7	121.8 18	438.9 62	472.1 67	437.7 263	5.2 -87	1.5 -84	8.7 -64
2011	19.9 -65	77.7 0	19.0 -77	14.4 -66	64.7 -7	170.5 57	399.2 38	508.8 55	210.0 59	4.6 -89	0.3 -97	0.0 -100
2012	53.6 -7	18.8 -76	36.6 -55	47.0 10	9.7 -86	41.1 -62	412.3 42	427.6 30	229.2 74	2.7 -94	4.8 -53	31.4 28

**Annexure 03 : Soils of Chamoli district of Uttarakhand**

**NOT AVAILABLE**

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation (non-demarcated, only less than 2 per cent area is rainfed)

Condition	Suggested Contingency measures				
	Major Farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Early season drought (delayed onset)	High hills (high rainfall, temperate climate, humid condition during rainy season, high snow fall, clayloam to sandy/silty soils)	Finger millets mixed with Amaranth/ Pulses	Finger millet (VLM 146, VLM 149, VLM 315 VLM 324) Horsegram (VLG-1, VLG-8, VLG-10)/Ricebean  Amaranth (VL chua-44) + Horsegram/Ricebean (PRR-1, PRR-2)	Use of short duration varieties. Addition of organic matter Conserve residual moisture for sowing of <i>rabi</i> crop	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Tomato, Capsicum, Brinjal, Chilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling, Use of organic manure at sowing, Timely weeding Conserve residual moisture for sowing <i>rabi</i> crops	
	Mid hill South aspect (Low rainfall, dry receiving maximum sun light due to high sun intensity, clay loam to sandy/silty soils)	Cheti/Spring Rice (End March-Mid April)-Veg. Pea	Cheti/Spring Rice (VL 206, VL207, VL 208, VL 209)	Use of short duration variety, organic manure at sowing Conserve residual moisture for sowing of <i>Rabi</i> crop Life saving water application through low cost drip/sprayer/sprinkler, mulching	
		Finger millet –Pea, Finger millet –Lentil, Fingermillet-Fallow Barnyard Millet-Wheat	Finger millets (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)+Black Soybean/Horse gram (VLG1)	Increase seed rate, Intercropping, Timely weeding, addition of organic manures (FYM/Compost) @ 5-10 t/ha treated with Trichoderma, Dust mulching	
		Marize-Wheat	Maize (Him 129, Vivek Hy 5, Vivek Maize Hybrid 9, VL Makka 88) Baby Corn-VL Makka 42	Sowing method, intervention, higher seed rate, addition of organic manures (FYM/Compost) @ 5-10 t/ha	

		Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
Mid hill North aspect (Low rainfall, dry receiving maximum sun light due to high sun intensity, clay loam to sandy/silty soils)	Cheti/Spring Rice (End March-Mid April)-Veg. Pea	Cheti/Spring Rice (VL 206, VL207, VL 208, VL 209)	Cheti/Spring Rice (VL 206, VL207, VL 208, VL 209)	Life saving water application through low cost drip/sprayer/sprinkler, mulching	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
	Finger millet +Black soybean/Horsegram-Wheat	Finger millets +Black Soybean/Horsegram-Wheat	Finger millets +Black Soybean/Horsegram-Wheat	Increase seed rate, Intercropping, Timely weeding,	
	Black Soybean + Barnyard millet-Veg pea	Black Soybean (VL Soya-2, VL Soya-21, 47)+Barnyard millet (VL Madira-172, 29)	Black Soybean (VL Soya-2, VL Soya-21, 47)+Barnyard millet (VL Madira-172, 29)	Increased seed rate Intercropping Timely weeding, Addition of organic manures (FYM/Compost) @ 5-10 t/ha treated with Trichoderma	
	Black Soybean Horsegram Finger millet Barnyard millet	Black Soybean-Local Horsegram-Local, VLG-1 Finger millet-Local, VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2, Barnyard millet-Local, VL 29, VL 21, VL Madira 172, PRJ 1	Black Soybean-Local Horsegram-Local, VLG-1 Finger millet-Local, VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2, Barnyard millet-Local, VL 29, VL 21, VL Madira 172, PRJ 1	-	
	Marize-Wheat	Maize (Him 129, Vivek Hy 5, Vivek Maize Hybrid 9, VL Makka 88) Baby Corn-VL Makka 42	Maize (Him 129, Vivek Hy 5, Vivek Maize Hybrid 9, VL Makka 88) Baby Corn-VL Makka 42	Sowing method, intervention, higher seed rate, addition of organic manures (FYM/Compost) @ 5-10 t/ha	
	Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Wallnut, Citrus	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
Lower hills & Valleys	Cheti/Spring Rice (End March-Mid April)-Veg. Pea Cheti Rice-Wheat	Cheti/Spring Rice (VL 206, VL 207, VL 208, VL 209)	Cheti/Spring Rice (VL 206, VL 207, VL 208, VL 209)	Life saving water application through low cost drip/sprayer/sprinkler, Mulching	Supply of seeds through TDC, NSC Dept. of Agriculture

		Finger millet-Pea, Finger millet-Lentil, Finger millet-Fallow Barnyard Millet-Wheat	Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2) + Black Soybean/Horse gram (VLG 1), Barnyard Millet (PRJ-1)	Increased seed rate, Intercropping Timely weeding, Addition of organic manures (FYM/Compost) @ 5-10 t/ha treated with Trichoderma	and KVK
		Rice-Wheat	Rice (VL D 221)		
		Rice-Cabbage-Maize (Green cob), Rice- Cabbage-Potato	Rice (VLD 81, VD 82, VLD 61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	
		French bean/Rainfed paddy/Finger millet/Wheat/Toria/ Chilli	No change	Spray of anti- transparent, in situ water conservation, use of organic manure at sowing Mulching with black plastic, use of drip irrigation system.	
		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing <i>rabi</i> crops	

Condition	Suggested Contingency measures				
	Major Farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Early season drought (delayed onset)					
Delay by 4 weeks (15 <sup>th</sup> of July)	High hills (high rainfall, temperate climate, humid condition during rainy season, high snow fall, clayloam to sandy/silty soils)	Finger millets mixed with Amaranth/ Pulses	Finger millet (VLM 146, VLM 149, VLM 315 VLM 324) Amaranth-PRA 123, VL Chua 44 Rice bean-PRR 1, PRR 2  Horsegram (VLG-1, VLG-8, VLG-10)	Use of short duration varieties. Addition of organic matter Conserve residual moisture for sowing of <i>rabi</i> crop	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK  Anti-transpirants can be provided under input cost of various projects demonstration. Sprayers are supplied by Horticulture Deptt. on 50% subsidy to the farmers. 50% subsidy is

		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Wallnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing <i>rabi</i> crops	provided by horticulture department on mulch material and drip irrigation system.
Mid hill South aspect (Low rainfall, dry receiving maximum sun light due to high sun intensity, clay loam to sandy/ silty soils)	Cheti/Spring Rice (Sowing in the end March to Mid April)-Veg. Pea	Black Soybean +Barnyard millet (VL 29, VL 21, Madira 172, PRJ 1)	Change of crop Increased seed rate Intercropping, Timely weeding		
	Finger millet –Pea, Finger millet –Lentil, Finger Millet-Wheat	Horsegram, VL-8	Intercropping, Timely weeding		
	Maize-Wheat	Finger millet – VLM 146 Rajma (VL-Rajma 63, 125)	Use of short duration varieties.		
	Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing <i>rabi</i> crops		
Mid hill North aspect (Low rainfall, dry receiving maximum sun light due to high sun intensity, clay loam to sandy/ silty soils)	Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing <i>rabi</i> crops		
	Cheti/Spring Rice (End March-Mid April)-Veg. Pea	Cow pea (Pusa komal) Rajma (VL-Rajma 63)  Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)-Wheat	Change of crops Increased seed rate Intercropping Timely wedding		
	Finger millet +Black soybean/Horsegram-Wheat	Black Soybean/Barnyard millet-Wheat	Increase seed rate, Intercropping, Timely weeding,		

		Black Soybean + Barnyard millet-Veg pea	Spring rice-Local, VL 206, VL 207, VL 208, VL 209  Black Soybean-Local Horsegram-Local, VLG-1 Finger millet-Local, VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2, Barnyard millet-Local, VL 29, VL 21, VL Madira 172, PRJ 1	Increased seed rate, Intercropping Timely weeding, Addition of organic manures (FYM/Compost) @ 5-10 t/ha treated with Trichoderma	
		Spring Rice-Local, VL Black Soybean-Local Horsegram-Local, Finger millet-Local, Barnyard millet-Local	Finger millets + Horsegram/Rice bean Amaranth+Horsegram/Rice bean	Increased seed rate Intercropping Timely weeding,	
Lower- hills & Valleys		Cheti/Spring Rice (End March-Mid April)-Veg. Pea Cheti Rice-Wheat	Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM1, PRM2)	Change of crop, Use failed crop as fodder, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma	
		Finger millet-Pea, Finger millet-Lentil, Finger millet-Fallow Barnyard Millet- Wheat	Finger millet (VLM 146,	Use short duration varieties, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma, Sowing may be delayed till appropriate soil moisture condition reaches	
		Rice –Cabbage-Maize (Green cob), Rice-Cabbage-Potato	Change of crop Finger millet –VLM 146 Barnyard millet (VL Madira-172)	Bunding of terraces, Increased seed rate, Mulching, Sowing across the slope, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma	
		Cheti/Spring Rice (End March-Mid April)-Veg pea Cheti Rice –Wheat	Change of crop Finger millet –VLM 146	Spraying of antitranspirants, use of green shade nets (50%)	



		Pomegranate, Mango, Citrus, Malta	Pomegranate, Mango, Citrus, Malta	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	
		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Spraying of micro-nutrients, mulching of tree basin with organic/inorganic Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops mulches, spraying of anti-transpirants	

Condition	Suggested Contingency measures				
	Major Farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Early season drought (delayed onset)					
Delay by 6 weeks (4 <sup>th</sup> week of August) (4 <sup>th</sup> week of July)	High hills (high rainfall, temperate climate, humid condition during rainy season, high snow fall, clayloam to sandy/silty soils)	Potato/Mandua/Ramdana	Soybean/Rajma/ Ramdana	Use of organic manure at sowing	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	-

Mid hill South aspect (Low rainfall, dry receiving maximum sun light due to high sun intensity, clay loam to sandy/silty soils)	Chaiti/Spring Rice (sowing in end March to mid April)-Veg. Pea	Green Fodder, Radish (Pusa Chetki, Pusa Himani), Veg. French bean (Laxmi, Arka Komal), Cauliflower (Pusa Dipali, Improved Japanese), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride), Coriander, Spinach	Use of short duration variety, organic manure at sowing
	Finger millet-Pea, Finger millet-Lentil, Finger millet-Wheat  Maize-Wheat	Tomato, Capsicum, Brinjal, Chiilli, Potato	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops
Mid hill North aspect (Low rainfall, dry receiving maximum sun light due to high sun intensity, clay loam to sandy/silty soils)	Chaiti/Spring Rice (sowing in end March to mid April)-Veg. Pea	Green Fodder, Radish (Pusa Chetki, Pusa Himani), Veg. French bean (Laxmi, Arka Komal), Cauliflower (Pusa Dipali, Improved Japanese), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride), Coriander, Spinach	Change of crops Increased seed rate Intercropping Timely wedding Addition of organic manures (FYM/Compost) @ 5-10 t/ha treated with Trichoderma
	Finger millet-Black Soybean/Horsegram-Wheat Black Soybean+Barnyard millet-Pea	Tomato, Capsicum, Brinjal, Chiilli, Potato	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops
Rainfed lower hills and valley	Cheti/Spring Rice (End March-Mid April)-Veg. Pea Cheti Rice-Wheat	Radish (Pusa Chetki, Pusa Himani), Veg. French bean (Laxmi, Arka Komal), Cauliflower (Pusa Dipali, Improved Japanese), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach, French bean (VL bauni bean 1)	Change of crop, Use failed crop as fodder, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma

	<p>Frenchbean, Chilli, Tomato, Cabbage, Brinjal, Apple, Peach, Walnut, Citrus</p> <p>Chaiti/Spring Rice (sowing in end March to mid April)- Veg. Pea Cheti Rice-Wheat Finger millet-Pea, Finger millet-Lentil, Finger millet-Fallow Rice-Wheat</p>	<p>Potato, Veg Pea, Radish, Cabbage, Cauliflower, Broccoli, Carrot, Round radish</p> <p>Radish (Pusa Chetki, Pusa Himani), Veg French bean (Laxmi, Arka Komal), Cauliflower (Pusa Dipali, Improved Japoni), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach, French bean</p>	<p>Spraying of water for life saving and spraying of anti-transpirants.</p> <p>Mulching with drip irrigation system.</p> <p>Water sprayings for crop saving, mulching with organic material if crops is in active growth phase. If crop is only 10-15 days old then mulched with plastic mulching. Spraying of antitranspirants, use of shade nets (50%)</p> <p>Spraying of antitranspirants, use of green shade nets (50%)</p> <p>Spraying of micro-nutrients, mulching of tree basin with organic/inorganic mulches, spraying of anti transpirants</p> <p>Change of crop, Use failed crop as fodder, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma</p>	<p>Anti transpirants can be provided for demonstration on vegetables. Sprayers are supplied by Horticulture Deptt. on 50% subsidy to the farmers.</p> <p>Mulch sheet and drip irrigation system, shadenets by the Distt. Horticulture Deptt.</p>
	<p>Rice-cabbage-Maize (green cob), Rice-Cabbage-Potato</p>	<p>Green fodder (Jowar), Radish (Pusa Chetki, Pusa Himani); Veg. French bean (Laxmi, Arka Komal), Cauliflower (Pusa Depali, Improved Japoni), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride), Coriander, Spinach</p>	<p>Bunding of terraces, Increased seed rate, Mulching, Sowing across the slope, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma</p>	

		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
--	--	--	--	--	--

Condition		Suggested Contingency measures			
Early season drought (delayed onset)	Major Farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Delay by 8 weeks (15 <sup>th</sup> of August)	High hills	Finger millets mixed with Amaranth/Pulses	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Use of organic manure at sowing	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK -
			Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green) Green fodder (Barley), Green fodder (Berseem, Oats) Wheat (VL-829, HPW-251), Barley (Vimal), Barley (HBL-276) Garlic : GHC 1 Fodder oats : Palampur-1 & Kent		
		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	

Mid hills south aspect	Chaiti/Spring Rice (Sowing in end march to mid april)-Veg. Pea	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach Torla (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green)	Use of short duration variety, organic manure at sowing
	Finger millet-Pea Finger millet-Lentil	Green fodder (Barley), Green fodder (Berseem, Oats)	
	Finger millet-Wheat	Wheat (VL-829, HPW-251), Barley (Vimal), Barley (HBL-276)	
	Maize-Wheat	Garlic : GHC 1 Fodder oats : Palampur-1 & Kent	
	Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops
	Mid hills north aspect	Chaiti/Spring Rice (Sowing in end march to mid april)-Veg. Pea	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach Torla (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green)
Finger millets + Black Soybean/Horsegram		Green fodder (Barley), Green fodder (Berseem, Oats)	
Black Soybean+Barnyard millet-Pea		Wheat (VL 829, HPW 251), Barley (Vimal), Barley (HBL-276)	

		Spring paddy, Black soybean, Horsegram, Finger millet, Barnyard millet	Garlic : GHC 1 Fodder oats : Palampur-1 & kent	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding	
		Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Conserve residual moisture for sowing rabi crops	
Lower-Mid hills & Valleys		Frenchbean, Chilli, Tomato, Cabbage, Brinjal, Apple, Peach, Walnut, Citrus	Potato, Veg Pea, Radish, Cabbage, Cauliflower, Broccoli, Carrot, Round radish	Spraying of water for life saving and spraying of anti-transpirants.  Water sprayings for crop saving, mulching with organic material if crops is in active growth phase. If crop is only 10-15 days old then mulched with plastic mulching. Spraying of antitranspirants, use of shade nets (50%)	Anti transpirants can be provided for demonstration on vegetables. Sprayers are supplied by Horticulture Deptt. on 50% subsidy to the farmers.  Mulch sheet and drip irrigation system by the Distt. Horticulture Deptt.
		Chaiti/Spring Rice (Sowing in end march to mid april)-Veg. Pea	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach		
		Cheti rice-wheat Finger millet-Pea Finger millet-Lentil Finger millet-Fallow		Spraying of antitranspirants, use of green shade nets	
		Rice -Wheat Cheti/Spring Rice (End March-Mid April)-Veg pea	Toria, Spinach, Chinese cabbage, Veg pea, French bean	Spraying of micro-nutrients, mulching of tree basin with organic/inorganic mulches, spraying of anti transpirants	Anti transpirants can be provided under input cost of HTM MM-II for demonstration. Sprayers are supplied by Horticulture Deptt. on subsidy to the farmers. Subsidy is provided by horticulture department on mulch material and drip irrigation system.
		Cheti Rice-Wheat Finger millet-Pea Finger millet-Lentil Finger millet-Fallow Barnyard millet-Wheat	Green fodder  Wheat, Barley		
		Barnyard millet-Wheat	Garlic Fodder oats		
		Pomegranate, Mango, Citrus, Malta	Pomegranate, Mango, Citrus, Malta	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	-

		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
--	--	--	--	--	--

Condition	Suggested Contingency measures				
	Major Farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Soil management <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	High hills	Potato/Mandua/Ramdana	Spraying of anti-transpirants	Use of organic manure at sowing /mulching. <i>In situ</i> water conservation with low cost poly tanks for harvesting normal onset	Construction of rain water harvesting ponds through IWMP and MNREGS
		Finger millets mixed with Amaranth/Pulses	Gap filling/re-sowing	Top N dress recommendation of rainfed crop coinciding with rain splashes; rain water harvesting of surrounding fields, Use local available plant material for mulch	
		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing <i>rabi</i> crops	

Medium hill South aspect	Mandua/ Jhingora Wheat/mustard	Gap filling	Use of short duration variety, organic manure at sowing	Constructing rain water harvesting ponds through MNREGS
	Cheti/spring Rice (End march-mid april)-Veg Pea	No change	Top N dress recommendation of rainfed crop coinciding with rain splashes; rain water harvesting of surrounding fields, Use local available plant material for mulch	
	Finger millet-Pea Finger millet-Lentil Finger millet-Wheat Maize-Wheat	Gap filling/re-sowing		
	Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
Medium hill North aspect	Cheti/spring Rice (End march-mid april)-Veg Pea	No change	Spray of NPK solution or N Top dress recommendation coinciding with rain splashes; rain water harvesting of surrounding fields, Mulching, Bunding, Life saving irrigation	
	Finger millet+Black Soybean/Horsegram Black Soybean+Barnyard millet-Pea	No change		
	Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	



Lower hills and Valley	Frenchbean, Chilli, Cabbage, Tomato, Brinjal	Resowing of seed in the patches where poor germination is observed  Re-transplanting;	Use of recommended doses of organic manure. In situ water conservation with low cost poly tanks for harvesting normal onset  Use of mulching, Sprinkler/drip irrigation system. In situ water conservation.	Low cost water harvesting structures may be provided under state or central funded schemes
	Cheti/spring Rice (End march-mid april)-Veg Pea Cheti Rice-Wheat  Finger millet-Pea Finger millet-Lentil Finger millet-Wheat Maize-Wheat Rice-Wheat	No change  Gap filling/re-sowing	Spray of NPK solution or N Top dress recommendation coinciding with rain splashes; rain water harvesting of surrounding fields, Mulching, Bunding, Life saving irrigation	
	Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
	Pomegranate, Mango, Citrus, Malta	Pomegranate, Mango, Citrus, Malta	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	

Condition	Suggested Contingency measures Condition			
Mid season drought [long dry spell, consecutive 2 weeks rainless (>2.5 mm) period]	Major Farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Mid season drought [long dry spell, consecutive 2 weeks rainless (>2.5 mm) period]
At vegetative stage				
High hill	Potato/Mandua/Ramdana	Mid season correction (thinning within the row and between the row) Remove every third row, praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions, rationing of drought affected crops if subsequent rain is possible and use of antitranspirant.	Organic mulches/grass mulching, Earthing in Potato. In situ water conservation with low cost poly tanks for harvesting normal onset  Foliar N management (1% urea spray) instead of Top N dress only if the crop stand is still better, Spray of potassium nitrate and potassium chloride, and use local available plant material for mulch	Construction of rain water harvesting ponds through IWMP and MNREGA
	Finger millets mixed with Amaranth/Pulses	Use of antitranspirants, life saving irrigation if available, Thinning for reducing plant population		
	Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
Mid hill South aspect	Rice/Mandua/Potato/Jhingora-wheat/mustard  Cheti/Spring Rice (End March-Mid April)-Veg. Pea  Finger millet-Pea Finger millet-Lentil Finger millet-Wheat Maize-Wheat	Use of antitranspirants, life saving irrigation if available, Thinning for reducing plant population	Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their in-situ mulching, Use local available plant material for mulch	Mid season correction and use moisture conservation practices

	Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
Mid hill North aspect	Cheti/Spring Rice (End March-Mid April)-Veg. Pea  Finger millet+Black Soybean/Horsegram Black Soybean+Barnyard millet-Pea  Spring Rice, Black Soybean, Horsegram, Finger millet, Barnyard millet	Use of antitranspirants, life saving irrigation if available, Thining for reducing plant population	Spray of NPK solution or N Top dress recommendation coinciding with rain splashes; rain water harvesting of surrounding fields, Mulching, Bunding, Life saving irrigation	
	Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	
Low hills and valleys	French bean, Rainfed paddy/Finger millet/Barnyard millet/Wheat/toria, Cabbage, Chilli, Tomato, Brinjal	Use of anti-transpirants, use of shade-nets (50%) Life saving irrigation if available	Hoing and weeding, organic mulching, windbreak and shelterbelts  Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their in-situ mulching, Use local available plant material for mulch	Construction of rain water harvesting ponds as a long term drought proofing measure.
	Cheti/Spring Rice (End March-Mid April)-Veg. Pea Cheti Rice-Wheat  Finger millet-Pea Finger millet-Lentil Finger millet-Fallow Barnyard Millet-Wheat			
	Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	

	Pomegranate, Mango, Citrus, Malta	Pomegranate, Mango, Citrus, Malta	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	
--	-----------------------------------	-----------------------------------	--	--

Condition	Major Farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
			Crop management <sup>c</sup>	Soil management <sup>d</sup>	Remarks on Implementation <sup>e</sup>
<b>Mid season drought</b>  <b>(long dry spell)</b>  <b>At reproductive stage</b>	High hill	Potato/Mandua/Ramdana-wheat           Finger millets mixed with amaranth/Pulses	Water sprayings with conserved water in potato, Remove 3-4 basal leaves of the crop in case of early stoppage of rain, spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions   Life saving irrigation Anti-transpirant spray Salicylic acid spray to induce earliness Harvesting at physiological maturity	Organic mulches, Hoeing and weeding, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop     Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their in-situ mulching, Use local available plant material for mulch	Use moisture conservation practices

	Mid hill south aspect	Rice/Mandua/Potato/Jhingora-wheat/mustard  Cheti/Spring Rice (End March-Mid April)-Veg. Pea  Finger millet-Pea Finger millet-Lentil Finger millet-Wheat Maize-Wheat	Remove 3-4 basal leaves of the crop in case of early stoppage of rain, spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions  Life saving irrigation Anti-transpirant spray Salicylic acid spray to induce earliness If grain setting has occurred in maize, de tasseling can be done to reduce transpiration Harvesting at physiological maturity	Organic mulches, Hoeing and weeding, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop	-
	Mid hill North aspect	Cheti/Spring Rice (End March-Mid April)-Veg. Pea  Finger millet+Black Soybean/Horsegram Black Soybean+Barnyard millet-Pea  Spring Rice, Black Soybean, Horsegram, Finger millet, Barnyard millet	Use of antitranspirants, life saving irrigation if available, Thining for reducing plant population  Life saving irrigation Anti-transpirant spray Salicylic acid spray to induce earliness Harvesting at physiological maturity	Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their in-situ mulching, Use local available plant material for mulch	

	Low hill/Valley	Frenchbean, Tomato, Chilli, Brinjal, Cabbage  Cheti/Spring Rice (End March-Mid April)-Veg. Pea Cheti Rice-Wheat  Finger millet-Pea Finger millet-Lentil Finger millet-Fallow Barnyard Millet-Wheat	The techniques earlier used as shade-nets irrigation through drip system etc. Site-specific crop management technologies : <ul style="list-style-type: none"> <li>• Thining</li> <li>• Life saving irrigation from rain water harvest ponds.</li> <li>• Weeding and weed mulching</li> <li>• Anti-transpirant spray</li> <li>• Salicylic and spray to induce early maturity</li> <li>• Harvesting at physiological maturity</li> <li>• Harvest whatever crop is available and immediately conserve the soil moisture for Rabi crop</li> </ul>	Foliar N management (1% urea spray) instead of Top N dress only if the crop stand is still better, Spray of potassium nitrate and potassium chloride, and use local available plant material for mulch	Construction of rain water harvesting ponds as a long term drought proofing measure
--	-----------------	--	---	--	---

### 2.1.2 Rainfed situation (Rabi season)

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 2 weeks 1 <sup>st</sup> week of <b>January</b> (2 <sup>nd</sup> week of <b>December</b> ) (Normal onset)	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials Use of short duration varieties. Gap filling Use of organic manure at sowing Timely application of fungicides for control of diseases Timely application of insecticides for the control of insect vectors. Timely weeding Conserve residual moisture for sowing <i>Kharif</i> crops	
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Intercropping Late sown Wheat (VL 892, HS-420, HPW42, Raj 3777)		
		Onion, Garlic, Pea, Rai, Late Cauliflower	No change		
		Mango, Citrus, Pomgranate	No change		

				orchards to prevent the plant from frost damage	
High & Mid hills North aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	No change	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely application of fungicides for control of diseases Timely application of insecticides for the control of insect vectors. Timely weeding Conserve residual moisture for sowing <i>Kharif</i> crops		
	Lentil Finger millet-Lentil	No change			
	Wheat Rice-Wheat/Barley, Finger millet-Wheat	Intercropping Late sown Wheat (VL 892, HS-420, HPW42, Raj 3777)			
	Onion, Garlic, Pea, Rai, Late Cauliflower	No change			
High & Mid hills South aspect	Apple (Spur type), Pear, Peach, Walnut, Apricot	Planting of Temperate fruit orchard of Apple (Spur type), Pear, Peach, Walnut, Apricot	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching		
	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	No change			
	Lentil Finger millet-Lentil	No change			
	Wheat Rice-Wheat/Barley, Finger millet-Wheat	Intercropping Late sown Wheat (VL 892, HS-420, HPW42, Raj 3777)			
	Onion, Garlic, Pea, Rai, Late Cauliflower	No change			
Mango, Pear, Peach, Walnut, Apricot	Planting of Temperate fruit orchard of Apple (Spur type), Pear, Peach, Walnut, Apricot	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before			

				planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	
--	--	--	--	--	--

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 4 weeks (3 <sup>rd</sup> week of January) (4 <sup>th</sup> week of December)	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Late sown wheat (VL 892) Potato (Kufri Jyoti), Green Coriander, Spinach		
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses		
	High & Mid hills South aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea, Finger Millet-Veg. Pea	No change	-	
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Late sown wheat (VL 892) Potato (Kufri Jyoti), Green Coriander, Spinach		
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed	



			polyhouses	sowing of cucurbitaceous crops.	
		Walnut, Peach, Plum	Digging of pit and planting of saplings of desired fruit crops	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants	
	High-Mid hills North aspect	Vegetable Pea Cheti/ Spring Rice (End March-Mid April)-Veg Pea,Finger Millet-Veg. Pea	No change	-	
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Late sown wheat (VL 892) Potato (Kufri Jyoti), Green Coriander, Spinach		
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery	
		Apple (Spur varieties), Walnut, Peach, Plum	Digging of pit and planting of saplings of desired fruit crops	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 6 weeks 1 <sup>st</sup> week of February 2 <sup>nd</sup> week of January	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), Green Coriander, Spinach		
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses Planting of cucurbits in the field	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
	High-Mid hills South aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach		
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), Green Coriander, Spinach		

		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
		Walnut, Peach, Plum	Digging of pit and planting of saplings of desired fruit crops	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	
	High-Mid hills North aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the	

			low cost polytunnels and polyhouses	mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
		Apple (Spur varieties), Walnut, Peach, Plum	Digging of pit and planting of saplings of desired fruit crops	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 8 weeks 3 <sup>rd</sup> week of February					
4 <sup>th</sup> week of January	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash,	Soil solarization/Soil fumigation with formaldehyde three week before nursery	

			Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses	sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
	High-Mid hills South aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach		
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), Green Coriander, Spinach		
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
		Walnut, Peach, Plum	Digging of pit and planting of saplings of desired fruit crops	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits.	

				Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	
	High-Mid hills North aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), Green Coriander, Spinach	-	
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
		Apple (Spur varieties), Wallnut, Peach, Plum	Digging of pit and planting of saplings of desired fruit crops	Digging of pits and plantation of elite saplings of desired fruit crops. Incorporation of organic + inorganic manures at the time of planting in the pits. Incorporation of pesticides before planting in the pits. Timely irrigation to the young plants as and when required. Use of antitranspirants, use of mulching	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Early season drought followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger millet-Lentil	No change	-	
		Wheat Rice-Wheat/Barley, Finger Millet-Wheat	Intercropping Late sown Wheat (VL892), HS-420, HPW-42, Raj 3777)	-	
	High-Mid hills South aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger millet-Lentil	No change	-	
		Wheat Rice-Wheat/Barley, Finger Millet-Wheat	Intercropping Late sown Wheat (VL892), HS-420, HPW-42, Raj 3777)	-	
	High-Mid hills North aspect	Vegetable Pea Cheti/Spring Rice (End March-Mid April)-Veg Pea Finger Millet-Veg. Pea	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger millet-Lentil	No change	-	
		Wheat Rice-Wheat/Barley, Finger Millet-Wheat	Intercropping Late sown Wheat (VL892), HS-420, HPW-42, Raj 3777)	-	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Mid season drought [long dry spell, consecutive 2 weeks rainless (>2.5 mm) period] At vegetative stage	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End March-Mid April)- Veg Pea Finger Millet-Veg. Pea	Site-specific crop	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger millet-Lentil Wheat Rice-Wheat/Barley, Finger Millet-Wheat	Mid season correction (thinning with in the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions, rationing of drought affected crops if subsequent rain is possible and use of anti-transpirant	Hoeing and weeding, organic mulching, windbreak and shelterbelts	
	High-Mid hills South aspect	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish	Mid season correction (thinning with in the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of antitranspirant	Hoeing and weeding, organic mulching, windbreak and shelterbelts	



	High-Mid hills North aspect	Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+( Horse gram/ Urd/ Arhar) /Barnyard millet, (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/Barley/Mustard/Radish	Mid season correction (thinning within the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of antitranspirant	Hoeing and weeding, organic mulching, windbreak and shelterbelts	
--	--------------------------------	--	--	--	--

### 2.1.3 Irrigated situation (Kharif Season)

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 2 weeks	Lower hills & Valley	Rice-Wheat	Rice (VLD 81), VD82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM)/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials.	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Rice-Cabbage-Maize (Green cob), Rice-Cabbage-Potato	Rice (VLD 81), VD82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	
		Tomato, Capsicum, Brinjal, Chilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 4 week <b>3<sup>rd</sup> week of July</b>	Lower hills & Valley	Rice-Wheat	Rice (VLD 81), VD82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials.	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Rice-Cabbage-Maize (Green cob), Rice-Cabbage-Potato	Rice (VLD 81), VD82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	
		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling, Timely weeding Use of organic manure at sowing Conserve residual moisture for sowing rabi crops	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 6 week <b>1st week of August</b>	Lower hills & Valley	Rice-Wheat	Rice (VLD 81), VD82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials.	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Rice-Cabbage-Maize (Green cob), Rice-Cabbage-Potato	Rice (VLD 81), VD82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	
		Tomato, Capsicum, Brinjal, Chiilli, Potato	Tomato, Cabbage, Cauliflower, Radish, Frenchbean, Pea, Plantation of Malta trees	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely weeding Conserve residual moisture for sowing rabi crops	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 8 week <b>3<sup>rd</sup> week of August</b>	Lower hills & Valley	Rice-Wheat	Rice (VLD 81), VD82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials.	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Rice-Cabbage-Maize (Green cob), Rice-Cabbage-Potato	Rice (VLD 81), VD82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	
		Tomato, Capsicum, Brinjal, Chiilli, Potato, Apple, Peach, Walnut, Citrus	Cabbage, Cauliflower, Radish, Round radish, Rai, Coriander, Frenchbean, Pea, Plantation of Malta	Use of short duration varieties. Gap filling, Timely weeding Use of organic manure at sowing Conserve residual moisture for sowing rabi crops	

#### 2.1.4 Irrigated situation (Rabi Season)

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 2 week <b>1st<sup>d</sup> week of January</b>	Lower hills & Valley	Wheat Rice-Wheat	Late sown Wheat (VL 892, HS-420, HPW-42, Raj 3777)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials.	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Onion, Garlic, Pea, Rai, Late Cauliflower	No change	Use of short duration varieties. Gap filling Use of organic manure at sowing Timely application of fungicides for control of diseases Timely application of insecticides for	

				the control of insect vectors. Timely weeding Conserve residual moisture for sowing Kharif crops	
		Mango, Citrus, Pomgranate	No change	Fumigation and maintaining appropriate moisture in the orchards to prevent the plant from frost damage	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 4 week					
3 <sup>rd</sup> week of January	Lower hills & Valley	Wheat Rice-Wheat	Late sown Wheat (VL 892, HS-420, HPW-42, Raj 3777)	Foliar N management (1% NPK spray), addition of organic manures (FYM)/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials.	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	
		Mango, Citrus, Pomgranate	No change	Fumigation and maintaining appropriate moisture in the orchards to prevent the plant from frost damage	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 6 week					
1 <sup>st</sup> week of February	Lower hills & Valley	Wheat Rice-Wheat	Change of Crop Potato (Kufri Jyoti),	Foliar N management (1% NPK spray), addition of organic manures	Supply of seeds through TDC,

			Green Coriander, Spinach	(FYM)/compost) @ 5-10 t/ha, soil moisture conservation measures	NSC Dept. of Agriculture and KVK
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses Planting of cucurbits in the field	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measure		
			Change in crop/cropping system	Agronomic measure	Remarks on implementation
Delay by 8 week  3rd week of February	Lower hills & Valley	Wheat Rice-Wheat	Change of Crop Potato (Kufri Jyoti), Green Coriander, Spinach	Foliar N management (1% NPK spray), addition of organic manures (FYM)/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials.	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Pea, Onion, Garlic, Rai, Late Cauliflower	Sowing of Tomato, Capsicum, Brinjal, Chilli, Summer squash, Bottle gourd, Cucumber, Bittergourd in Nursery under low cost polytunnels and polyhouses	Soil solarization/Soil fumigation with formaldehyde three week before nursery sowing Filling of poly bags (with the mixture of soils, sand and FYM in the ratio of 1:1:1) and seed sowing of cucurbitaceous crops. Frequent irrigation in nursery Control of pest and diseases	

**Notes:**

1. Describe the major farming situation such as shallow red soils, deep black soils, uplands, medium lands, eroded hill slopes etc. tank fed black soils, shallow acid soils, sodic vertisols etc.
2. Describe the normal crop or cropping system grown in that farming situation including variety if known

3. Describe the alternative crop or variety or cropping pattern in view of the delay in monsoon and shortening of the growing period including delay in sowing of nurseries in case of paddy. In case of normal onset followed by early season droughts re-sowing may be recommended including variety seed rate etc. In case of early or mid season dry spells indicate crop management techniques to save standing crop. In case of terminal drought indicate giving life saving supplemental irrigation, if available or taking up harvest at physiological maturity with some realizable grain/fodder yield etc.
4. Describe all agronomic practices which help in coping with late planting like increased or decreased spacing, changes in planting geometry, intercropping in case of sole crops, thinning, mulching, spray of anti-transpirants or other chemicals, supplemental irrigation, soil and moisture conservation practices like ridging, conservation furrows, dust mulch etc. In case of early and mid season dry spells indicate moisture conservation techniques to save standing crop. In case of terminal drought indicate early rabi cropping with suitable crops/varieties with a possibility of giving pre-sowing/come up irrigation etc.
5. Give details on the source of the breeder seed, in case an alternate crop or variety is suggested as part of the contingency. For agronomic measures, indicate any convergence possible with ongoing central or state schemes like National Rural Employment Guarantee Scheme (NREGS), Integrated Watershed Management Programme (IWMP), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM), Community Land Development Programme (CLDP) etc., to meet the cost of materials, labour or implements etc. to carry out any field based activity quickly.

### 2.1.5 Irrigated situation - NOT APPLICABLE

#### 2.2 Un-timely (un-seasonal) rains (For both Rainfed and irrigated situations) Kharif Season

Condition	Suggested contingency measure			
	Vegetative stage <sup>k</sup>	Flowering stage <sup>l</sup>	Crop maturity stage <sup>m</sup>	Post harvest <sup>n</sup>
<b>Continuous high rainfall in a short span leading to water logging</b>				
Rice	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition and use of short stature varieties Strengthening of field bundings, In water logged condition, form open drains about 60cm in depth and 45 cm width across in field	Drain out excess water through drainage channels, NPK foliar application after water draining	Drainage, avoid water stagnation in the plots  Harvesting at physiological maturity	Store the produce under shed and dry using artificial sources like large fans and use mechanical drier.
Finger –millet, Maize	From open drainage channels across the field	Drain out excess water through drainage channels,	Cob harvesting from standing crop, drain out excess water, Harvesting at physiological maturity	Proper drying and storage of grains
Green Fodder	From open drainage channels across the field	Drain out excess water through drainage channels,	Not applicable	

<b>Horticulture</b>				
Tomato	Make drainage channel, Ridges and top dressing of N	Improve drainage, spraying of micro nutrients. Avoid water stagnation in the field.	Improve drainage, spraying of micro nutrients. Avoid water stagnation in the field.	Store the produce under shed.
Potato	Drainage, N top dressing, earthing up	Drainage, removing weeds and older leaves for proper aeration	Removing (halms (upper portion)	Keep produce at dry place but not in heap
Cabbage	Avoid water stagnation in the field. Make drainage channel, Top dressing of N, Spraying of Borax	-	Improve drainage, Avoid water stagnation	Keep produce at dry place but not in heap
French bean	Improve drainage	Avoid water stagnation in the field	Remove excess water	Keep produce at dry place but not in heap
Veg pea	Make drainage channel, Avoid water stagnation.	Make drainage channel, Avoid water stagnation, spraying of micro-nutrients.	Remove excess water	Keep produce at dry place but not in heap
Apple	Remove excess water	Spraying of micro nutrient/PBRs to improve fruit set	Spraying of micro nutrient/PBRs to improve yield and quality	Store at cool, dry, ventilated place, avoid heaping, package in wooden boxes
Peach	Remove excess water	Spraying of micro nutrient/PBRs to improve fruit set	Spraying of micro nutrient/PBRs to improve yield and quality	Store at cool, dry, ventilated place, avoid heaping, package in wooden boxes
Citrus	Remove excess water	Spraying of micro nutrient/PBRs to improve fruit set	Spraying of micro nutrient/PBRs to improve yield and quality	Store at cool, dry, ventilated place, avoid heaping
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
Rice, Maize, Finger-millet, Black Soybean	In water logged condition, form open drains across the field	Improve drainage, N top dressing	Drainage, avoid water stagnation in the plots, Tying	Store the produce under shed and dry using artificial sources like large fans
<b>Horticulture</b>				
Tomato	Improve drainage, Proper staking	Improve drainage, Top dressing of N, Spraying of Micro nutrients	Improve drainage, Spraying of Micro nutrients	Store the produce under shed.
Potato	Drainage, earthing up, N top dressing	Drainage,	Cutting the halms portion	Keep produce at dry place but not in heap
Cabbage	Improve drainage, Avoid water stagnation, Spraying of Borax	-	Improve drainage, Avoid water stagnation	Keep produce at dry place but not in heap

French bean	Improve drainage	Avoid water stagnation in the field	Avoid water stagnation in the field	Store the produce under shed
Veg pea	Proper staking/Drainage	Staking	Safe removal of excess water	Store the produce under shed.
Apple & Pear	Staking of saplings during pre-bearing stage Selection of dwarf cultivars/root stocks Apply 40-50 kg FYM/tree or recommended nutrients Earthing up around the trunk Soil working to improve soil aeration and control weeds	Complete drainage, Channelization of excess water Earthing up around the trunk Soil working to improve soil aeration and control weeds Hormonal or multinutrient spray for promoting flowering/fruit set	Till the soil within the basin to improve soil aeration and control weeds	Harvest the fruit on sunny day Proper storage and immediate transportation to market/godown
Other Temperate Fruits (Stone Fruit)	Complete drainage, Channelization of excess water Earthing up around the trunk Soil working to improve soil aeration and control weeds	Complete drainage, Channelization of excess water, Earthing up around the trunk, Soil working to improve soil aeration and control weeds Hormonal or multinutrient spray for promoting flowering/fruit set Use supplement pollination techniques to improve pollination and fruit set-	Complete drainage, Channelization of excess water Till the soil within the basin to improve soil aeration and control weeds	Harvest the fruit on sunny day Proper storage and immediate transportation to market/godown -
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Rice & Finger millet	<b>Brown plant hopper</b> : Drain the water before use of insecticides and direct the spray towards the base of the plants. Monocrotophos @ 1250ml/ha (or) Acephate 500 g/ha <b>Stem Borer</b> : Prolonged moist and humid condition leads to outbreak, Spray Cartap hydrochloride 25kg/ha	<b>Brown plant hopper</b> : Drain the water before use of insecticides and direct the spray towards the base of the plants. Monocrotophos @ 500 ml/ac (or) Acephate 200 g/ha <b>Blast</b> : Spray after	<b>Stem Borer</b> : Prolonged moist and humid condition leads to outbreak. Spray Cartap hydrochloride 25 kg/ha <b>False smut in fingermillet and rice</b> : Spray cuprous hydroxide	Dry the produce up to 14% moisture,



		observing initial infection of the disease, Carbendazim @ 1g/l.	0.25%	
Maize	Proper Drainage	Top N dress after rain spells	Filed drainage	
<b>Horticulture</b>				
Early Veg pea & Capsicum	Wilt in low lying water logged patches : Drench Carbendazim 1.0 g/l at the base of plants	Powdery mildew-spray any sulphur containing fungicide Aphid-Spray Dimethoate	Field drainage	
Apple	<b>Apple scab</b> : Follow the recommended schedule for the control of Apple scab White root rot : Drain out excess water from the basin and drench the basin with Carbendazim 200g, or copper sulphate 100g/200l water (3-4 time at an interval of 15-20 days)	Blossom thrips – Spray Monocrotophos/Dimethoate Powdery Mildew – Spray any sulphur containing fungicide Scab : Spray Dithane M 45	Brown rot – Spray Dithane M 45	Proper storage and immediate transportation to market /godown
Peach	Aphid – Spray Metasystox/Dimethoate Peach leaf curl-spray COC/Dithane M 45	Powdery Mildew – Spray any sulphur containing fungicide		
Citrus	Aphid - Spray Metasystox/Dimethoate	Powdery Mildew – Spray any sulphur containing fungicide		

### 2.3 Un-timely (un-seasonal) rains (For both Rainfed and irrigated situations) Rabi Season

Condition	Suggested contingency measure			
	Vegetative stage <sup>k</sup>	Flowering stage <sup>l</sup>	Crop maturity stage <sup>m</sup>	Post harvest <sup>n</sup>
<b>Continuous high rainfall in a short span leading to water logging</b>				
Wheat	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Top N dress after rain spells, field drainage	Field drainage	Proper storage
Lentil	Drainage	Top N dress after rain spells, field drainage	Field drainage	Proper storage

<b>Horticulture</b>				
Potato	Drainage, N top dressing, earthing up	Drainage, removing weeds and older leaves for proper aeration	Removing (halms (upper portion)	Keep produce at dry place but not in heap
Veg pea	Make drainage channel, Avoid water stagnation.	Make drainage channel, Avoid water stagnation, spraying of micro-nutrients.	Remove excess water	Keep produce at dry place but not in heap
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
Wheat	Drainage	Top N dress after rain spells, field drainage	Field drainage	Store the produce under shed
Lentil	Drainage	Top N dress after rain spells, field drainage	Field drainage	Proper storage
<b>Horticulture</b>				
Potato	Drainage, earthing up, N top dressing	Drainage,	Cutting the halms portion	Keep produce at dry place but not in heap
Lentil	Drainage	Top N dress after rain spells, field drainage	Field drainage	Proper storage
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Wheat	Remove excess water	Remove excess water, fungicide spray	Remove excess water	Dry the produce up to 12-14% moisture,
<b>Horticulture</b>				
Potato	Late blight-Spray of Dithane M-45, Under heavy attack Ridomil Z-78	Late blight-Spray of Dithane M-45, Under heavy attack Ridomil Z-78	Late blight-Spray of Dithane M-45, Under heavy attack Ridomil Z-78	-
Veg pea	Root and Foot rot- Spray of Bavistin	Powdery mildew-spray any sulpher containing fungicide Aphid-Spray Dimethoate	Powdery mildew-spray any sulpher containing fungicide Pod borer-Spray Endosulfan	-

## 2.4 Floods, (not applicable)

### 2.5 Extreme events: Cold wave/Frost/ Hailstorm

Extreme event type	Suggested contingency measure <sup>r</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Cold wave<sup>a</sup></b>				
Wheat		Light irrigation		
Rice				
Mandua				
Jhingora				
Tomato	Use of poly low tunnels			
<b>Frost</b>				
Wheat	Light irrigation, smoke	Light irrigation, smoke		
Rice				
Mandua				
Jhingora				
Potato	Light irrigation, smoke	Light irrigation, smoke		
Cabbage	Light irrigation, smoke	Light irrigation, smoke		
Veg pea	-	Light irrigation, smoke		
Malta	Light irrigation, smoke	Light irrigation, smoke		
<b>Hailstorm</b>				
Wheat		Direct sowing of Chaiti Dhan if wheat crop completely destroyed		
Rice	Retransplanting and gap filling as per severity			
Mandua				
Jhingora				
Tomato		Anti hail net	Anti hail net	
Apple			Anti hail net	
Peach			Anti hail net	
Malta			Anti hail net	

### 3.1.1 Contingent strategies for Livestock, Poultry & Fisheries

#### Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			

Feed and fodder availability	Increasing area under fodder production, Crops residues and tree fodder storage. Use managers, use chaff cutters, hay storage. Establishment of fodder banks and Stock sufficient Urea Molasses Mineral Block (UMMB), mineral and vitamin mix, 4% urea treatment of dry fodder. Prepare the silage of non-leguminous fodder crops for the scarcity period. Animal insurance	Utilization of fodder from Perennial & reserve sources. Open grazing in forests and alpine slopes/community lands Feeding of crop residues; use of managers and chaff cutters, feeding of household waste, Provide Urea Molasses Mineral Block (UMMB), mineral and vitamin mix, 4% urea treatment of dry fodder	Availing Insurance, culling undesirable Livestock; Raising of short duration fodder crop, replacement of unproductive animals with improved ones
Drinking water	Storage of water in tanks, Traditional water ponds, rivers	Utilization of stored water, Stall drinking	Rejuvenation of water sources
Health and disease management	Advance preparation with medicines. Vaccinate animals against common diseases like FMD, HS, BQ, Rabbits, awareness camps, distribution of first Aids kits.	Treatment of affected livestock by mass campaign, Modern veterinary care, Animal camps.	Proper veterinary care, awareness camps, capacity building of locals, trainings on health care management
<b>Cold wave</b>			
Shelter/environment management	Provision of conventional house, covering of roof with polythene or leaf straw of pines. Brought back from high hill pasture lands to lower hills; restricted open grazing	Keep the animal enclosed with proper heating of house with fire places. Group living, dry grass flooring, gunny bags curtains on windows & door, Jute bags wrapped on the back & belly of animals, restricted open grazing during cold days. Prevent water-logging conditions in animal houses. In Kachha houses, the floor should be elevated. Feeding of straw & hay to animals with concentrates and protect the young ones from cold.	Allow animal for pasture grazing. Massage of milking animals and other species, hot water bath of animals
Health and disease management	Vaccinate & de-worm animals, balanced feeding	Extra vitamins and minerals, extra allowance of balanced feed. Warm living conditions, avoid exposure to cold and rains/snow. The prophylactic and preventive measures for the control of diseases. Deworm animals against endo and ecto-parasites.	Health check-up of animals for any disease.
<b>Poultry</b>			
	<b>Suggested contingency measures</b>		
	<b>Before the event<sup>a</sup></b>	<b>During the event</b>	<b>After the event</b>
<b>Drought</b>			
Shortage of feed ingredients	Surplus storage of poultry feed; No special preparations if they are kept as backyard.	Utilization of stored feed; No impact as they are kept in captivity. Moreover If they are kept as backyard then household	Availing Insurance for poultry Culling affected & unproductive birds.

		waste is sufficient for their keeping.	
Drinking water	Storage of water in tanks	Utilize stored water	Keep birds in open range system
Health and disease management	Advance preparation with medicines and vaccinate birds. Promote hardy and disease resistant poultry birds like broiler, guinea fowl and desi birds procured from reliable sources.	Deworm the birds. Local management	Keep as backyard activity and local health care
<b>Cold wave</b>			
Shelter/environment management	Closed housing with proper ventilation	Proper ventilation for fresh air. and provision of heater/blower during cold waves	Maintain or provide ambient temperature, proper ventilation, hygienic conditions in house
Health and disease management	Vaccination, de-worming	Extra vitamins, minerals and extra allowance of feed.	De-worming, clean environment, treatment if required.

<sup>a</sup> based on forewarning wherever available

**Fisheries :**

	<b>Suggested contingency measures</b>		
	<b>Before the event<sup>a</sup></b>	<b>During the event</b>	<b>After the event</b>
<b>Drought</b>			
Shallow water in ponds due to insufficient rains /inflows	Water harvesting structures with rain water impounding from catchment areas Keep a deeper portion as a refuge pond/depression/trench preferably at lower side of pond	Up to 50% of pond surface area may be covered with floating algae like azolla to reduce evaporation. Water to supplement at least 20% of the impoundment of pond to safeguard the stocked fish biomass may be arranged if available. Partial or complete fish harvesting may be done in extreme conditions to reduce the density & stress.	Water harvesting structures with rain water impounding from catchment areas; watershed development planning and implementations with focus on renovation and de-silting of pond
<b>Heat wave and Cold wave</b>			
Management of pond environment	Keep a deeper portion as a refugee pond/depression preferably at lower side of pond		
Health and disease management	Rapid mobile veterinary team (RMVT) may be formed		
Cyclone	Not applicable		
Floods	Not applicable		