

**State: HIMACHAL PRADESH**  
**Agriculture Contingency Plan for District: Una**

<b>1.0 District Agriculture profile</b>				
<b>1.1</b>	Agro-Climatic/Ecological Zone	Western Himalayas, Warm Subhumid (To Humid With Inclusion Of Perhumid) Eco-Region.(14.2)		
	Agro-Climatic Region (Planning Commission)	Western Himalayan Region (I)		
	Agro Climatic Zone (NARP)	Sub- montain and low hills, Sub-Tropical (HP-1)		
	List all the districts falling under the NARP Zone (*>50% area falling in the zone)	Chamba (S. Part), Una (Hamirpur), Solan, Bilaspur, Nahan , Kullu (S. Part), Dharmashala (S. Part)		
	Geographic coordinates of district	Latitude	Longitude	Altitude (a.m.s.l.)
		31 <sup>0</sup> 17'52'' – 31 <sup>0</sup> 52'0''	75 <sup>0</sup> 58'02'' – 76 <sup>0</sup> 28'25''	300 to 900
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRS- Akrot (Dist- Una)		
	Mention the KVK located in the district with address (This information available in ICAR phone directory which is available on ICAR website and please see under KVKs left hand side)	Krishi Vigyan Kendra, Rampur, Una, Himachal Pradesh-174303 Phone 01975-225003 (O), Dr. T.R. Nandal, Programme Coordinator ,0 9418453658(m) Email: pckvkuna@gmail.com lavbhushan@yahoo.com		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Dr. R.S. Rana, Agronomist, Department of Agronomy Forages and Grassland Management Palampur 176 062, CSKHPKV, Palampur			

<b>1.2</b>	<b>Rainfall – (since 2006-2012)</b>	<b>Average (mm)</b>	<b>Normal onset</b>	<b>Normal cessation</b>
	SW monsoon (June – Sep)	914.5	3 <sup>rd</sup> Week of June	2 <sup>nd</sup> week of September
	NE Monsoon (Oct – Dec)	39.6	1 <sup>st</sup> week of October	3 <sup>rd</sup> week of November
	Winter (Jan – Feb)	77.5	2 <sup>nd</sup> week of January	End of March
	Summer (March – May)	95.6	1 <sup>st</sup> week of April	End of May
	Annual	1127.2	July	November

1.3	Land use pattern of the district (latest statistics)-Area ('000ha)*								
Geographical Area	Cultivable area (Give net cultivable area)	Forest area	Land under non-agricultural use	Permanent Pastures and other grazing land	Cultivable wasteland	Land under misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
154.923	36.879	18.153	29.106	13.311	23.571	6.728	23.138	1.683	2.349

\*Source: Strategic research and extension plan of Una District, Agricultural Technology Management Agency (ATMA), Una District, Himachal Pradesh

1.4	Major Soils *	Area ('000 ha)	Percent (%) of total area
	Medium deep to deep, loamy-skeletal soils moderate to severe erosion; <i>associated with</i> : Loamy soils with moderate erosion	106	75.2
	Shallow, sandy soils with moderate erosion; <i>associated with</i> : Loamy soils	14	9.9
	Deep, loamy soils with moderate to severe erosion; <i>associated with</i> : Medium deep soils	12	8.5
	Medium deep, loamy soils with slight to moderate erosion; <i>associated with</i> : Deep soils	9	6.4
	<b>Total area</b>	140	100

\*Source: Soil Resource Maps of NBSS & LUP, estimated values

1.5	Agricultural land use *		
		Area ('000 ha)	Cropping Intensity (%)
	Net sown area	36.974	193
	Area sown more than once	34.495	
	Gross cropped area	71.469	
	Net irrigated area	8.556	

\*Source: Strategic research and extension plan of Una District, Agricultural Technology Management Agency (ATMA), Una District, Himachal Pradesh

1.6	Irrigation	Area ('000 ha) *	Percent (%)
	Net cultivated area	36.974	24 % of total geographical area
	Net irrigated area	8.556	23.2 % of the net area sown
	Gross cultivated area	71.469	-
	Gross irrigated area	13.588	37 % of net cropped area, 19% of total cultivated area
	Gross Rainfed area	57.881	-
	<b>Source of irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>
			<b>Percentage of net irrigated area</b>

Tank	1643	4.861	56.8
Open well	593	0.728	8.5
Bore well/Tube well	104	1.314	15.4
Lift irrigation	29	1.620	18.9
Pond/Khuls	148	0.003	0.0
Other sources	-	0.030	0.4
Total		8.556	100.0
Pump sets	Not available		
Micro-irrigation	Not available		
Groundwater availability and use (Data source: State/Central Ground water Department /Board)	No. of blocks:2	<70% area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
Over exploited	Not available		
Critical	Not available		
Semi critical	Not available		
Sage	Not available		
Wastewater availability and use	Not available		
Ground water quality	Good, EC<750m mhos/cm at 25 <sup>0</sup> C		

\* Source: Comprehensive District Agriculture Plan-Una, Himachal Pradesh, Centre for Research in Rural and Industrial Development (CRRID), Chandigarh – 160019

### 1.7 Area under major field crops & horticulture

Area under major field crops (2007-08)			
S. No	Major crop	Area ('000 ha)	% Area
	Wheat	32.981	46.1
	Maize	30.939	43.3
	Rice	2.023	2.8
	Millets	0.417	0.6
	Pulses	0.495	0.7
	Oilseeds	1.881	2.6
	Sugarcanes	0.198	0.3
	Fodder	1.645	2.3

<b>Area under major horticulture crops (2006-07)</b>			
	<b>Horticultural Crops</b>	<b>Total Area (*000 ha)</b>	<b>% Area</b>
	Mango	1.668	46.3
	Pear	0.745	20.7
	K.Lime	0.585	16.2
	Galgal	0.193	5.4
	Guava	0.164	4.5
	Litchi	0.126	3.5
	Aonla	0.123	3.4
<b>Area under major Vegetable crops (2006-07)</b>			
	Potato	0.790	37.5
	Other Vegetables	1.316	62.5

\* Source: District Agriculture Plan Una Himachal Pradesh, Centre for Research in Rural and Industrial Development (CRRID), Chandigarh – 160019

\*Source: Strategic research and extension plan of Una District, Agricultural Technology Management Agency (ATMA), Una District, Himachal Pradesh

<b>1.8</b>	<b>Livestock*</b>			
	<b>Category</b>	<b>Population</b>	<b>Production</b>	<b>Productivity</b>
	<b>Cattle</b>			
	Crossbred	23828	62002 tones	6.02 kg
	Indigenous	28198	-	1.577 kg
	Buffalo	121716	-	3.298 kg
	<b>Sheep</b>			
	Crossbred	115	1478 kg	Ram=1.900kg, Wether=1.612 kg, Ewe=1.750kg, Lamb=1.236 kg
	Indigenous	1773	-	Ram=2.516kg, Wether=2.258 kg, Ewe=1.290kg, Lamb=1.399 kg
	Goats	19271	-	0.408 kg
	<b>Pigs</b>			
	Crossbred	22		
	Indigenous	121		
	Rabbits	32		

\*Source: Dept. of Animal Health and Breeding, Una (18<sup>th</sup> livestock census, 2007)

<b>1.9</b>	<b>Poultry</b>				
	<b>Category</b>	<b>Population</b>	<b>Production</b>	<b>Productivity</b>	
		Hens	39441	149331 lacs eggs	-
		<i>Desi</i>	1671+520	-	228 eggs/yr
	<i>Improved</i>	31000	-	233 eggs/yr	

Ducks	19	-	-
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\*Source: Dept. of Animal Health and Breeding, Una (18<sup>th</sup> livestock census, 2007)

<b>1.10</b>	<b>Inland Fisheries*</b>			
	Fish	<b>Area</b>	<b>Productivity</b>	<b>Production (m tones)</b>
	Private Farms	93.5 ha.	1.7 m ton/ha	280.5
	Village ponds	128.5 ha.	1.7 m ton/ha	220.9
	River and river lets	65 km		64.918
	Reservoirs (four Fishermen Coop Societies)	--		183.676

\*Source: Deptt. of Fisheries, Una

<b>1.11</b>	<b>Production and productivity of major crops.</b>	<b>Kharif</b>		<b>Rabi</b>		<b>Summer</b>		<b>Total</b>	
		<b>Production ('000MT)</b>	<b>Productivity (kg/ha)</b>	<b>Production ('000MT)</b>	<b>Productivity (kg/ha)</b>	<b>Production ('000MT)</b>	<b>Productivity (kg/ha)</b>	<b>Production ('000MT)</b>	<b>Productivity (kg/ha)</b>
	Maize	72.3	2339	Not applicable		Not applicable		72.3	2339
	Paddy	4.7	2299	Not applicable		Not applicable		4.7	2299
	Wheat	Not applicable		55.6	1687	Not applicable		55.6	1687

\* Source: District Agriculture Plan Una Himachal Pradesh, Centre for Research in Rural and Industrial Development (CRRID), Chandigarh-160019

<b>1.12</b>	<b>Sowing window for 5 major field crops</b>	<b>Maize</b>	<b>Paddy</b>	<b>Wheat</b>
	<i>Kharif</i> - Rainfed	3 <sup>rd</sup> week of June to 1 <sup>st</sup> week of July	-	-
	<i>Kharif</i> -Irrigated	2 <sup>nd</sup> week of May to 3 <sup>rd</sup> week of June	2 <sup>nd</sup> week of May to 1 <sup>st</sup> week of July	-
	<i>Rabi</i> - Rainfed	-	-	2 <sup>nd</sup> week of October to 3 <sup>rd</sup> week of December
	<i>Rabi</i> -Irrigated	-	-	1 <sup>st</sup> week of November to 4 <sup>th</sup> week of December

<b>1.13</b>	<b>What is the major contingency the district is prone to? (Tick mark)</b>	<b>Regular</b>	<b>Occasional</b>	<b>None</b>
	Drought	√		
	Flood		√	
	Cyclone		√	

	Hail storm		√	
	Heat wave		√	
	Cold wave	√		
	Frost	√		
	Sea water intrusion			√
	Pests and disease outbreak (specify)	Fruit fly in cucurbits, Karnal bunt and Leaf blight in wheat, Brinjal fruit borer, Termite in maize , wheat, nematode in Kharif vegetables.	Yellow rust in wheat, rice leaf folder.	

1.14	Include Digital maps of the district for	Location map of district within State as Annexure 1	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation (*Kharif Crops*)

Condition	Suggested Contingency measures				Remarks on Implementation
Early season drought (delayed onset)	Major Farming situation	Normal Crop/ Cropping system	Change in crop / cropping system <sup>c</sup> including variety	Agronomic measures <sup>d</sup>	
Delay by 2 weeks Normal onset 20 <sup>th</sup> June ± 10 days 1 <sup>st</sup> week of July	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Maize+pulse system: Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG218, Him Mash-1)/ Sesame (LTK-4)	No change	Ensuring the availability of seeds in Deptt of Agriculture and State Agriculture University or ISOPOM
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Maize+pulse system: Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG218, Him Mash-1)/ Sesame (LTK-4)	No change	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Maize+pulse system: Maize + Soybean (Harit Soya/ Shivalik) / Blackgram (UG218, Him Mash-1)/	No change	

			Sesame (LTK-4)		
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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
Delay by 4 weeks 3 <sup>rd</sup> week of July	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Intercropping/mixed cropping Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG-218, Him Mash-1)/ Sesame (LTK-4) or Change of crop : Black Gram (Him mash-1, UG-218) up to 15 <sup>th</sup> July or Short duration varieties of maize viz. Bajaura Makka, Vivek, HQPM1 and Early Composite	Increase row spacing, Thinning of crop, Immediate ploughing and planking the field in order to conserve soil moisture, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for sowing of wheat, Increase the seed rate of soyabean and blackgram by 10-15%	ISOPOM, RKVY
	Medium rainfall, Shallow, sandy soils	Maize-Wheat	Intercropping/mixed cropping: Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG-218, Him Mash-1)/ Sesame (LTK-4) or Change of crop : Black Gram (Him mash-1, UG-218) up to 15 <sup>th</sup> July or Short duration varieties of maize viz. Bajaura Makka, Vivek, HQPM1 and Early Composite	Maize + Cowpea/ mash/ soybean/ sesame with good drainage for fodder purpose  Immediate ploughing and planking the field in order to conserve soil moisture, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for sowing.	

	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Intercropping/mixed cropping Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG-218, Him Mash-1)/ Sesame (LTK-4) or Change of crop : Black Gram (Him mash-1, UG- 218) up to 15 <sup>th</sup> July or Short duration varieties of maize viz. Bajaura Makka, Vivek, HQPM1 and Early Composite	Maize + Cowpea /mash /soybean /sesame with good drainage for fodder purpose  Immediate ploughing and planking the field in order to conserve soil moisture, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for sowing.	
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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
Delay by 6 weeks  1 <sup>st</sup> week of August	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Fellow -wheat	Maize fodder (African Tall), Short duration varieties of maize viz. Bajaura Makka, Vivek, HQPM1 and Early Composite	Maize fodder: increase seed rate  Immediate ploughing and planking the field in order to conserve soil moisture, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for sowing.	RKVY, ISOPOM,
	Medium rainfall, Shallow, sandy soils	Fellow -wheat	Maize fodder (African Tall), Short duration varieties of maize viz. Bajaura Makka, Vivek, HQPM1 and Early Composite	Maize fodder: increase seed rate Harvest maize crop at physiological maturity, Immediate ploughing and planking the field in order to conserve soil moisture, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for sowing, Seed priming of maize(0.1% thiourea) for 6	



				hours, dry sowing	
	Medium rainfall, Medium deep to deep, loamy soils	Fellow -Wheat	Short duration varieties of maize viz. Bajaura Makka, Vivek, HQPM1 and Early Composite	Maize fodder: increase seed rate Immediate ploughing and planking the field in order to conserve soil moisture, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for sowing.	

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
Delay by 8 weeks  3 <sup>rd</sup> week of August	Medium rainfall, Medium deep to deep, loamy- skeletal soils	Fellow-Wheat	Change in cropping system to Green fodder(Sorghum/bajra)/earl y pea (Arkel)-Toria (Bhawani)-late sown wheat (HS490/ Raj3777/ HPW42).	Ridge planting of Pea (Arkel). Harvest green fodder in 1 <sup>st</sup> week of Sept. Use rain water harvesting for irrigation using MIS. Immediate plough and plank the field after harvest of <i>Kharif</i> crops in order to conserve soil moisture and go for sowing of toria. Late sowing of wheat in mid December	ISOPOM & RKVY
	Medium rainfall, Shallow, sandy soils	Fellow-Wheat	Change in cropping system to Green fodder(Sorghum/bajra)/earl y pea (Arkel)-Toria (Bhawani)-late sown wheat (HS490/ Raj3777/ HPW42).	Ridge planting of Pea (Arkel). Harvest green fodder in 1 <sup>st</sup> week of Sept. Use rain water harvesting for irrigation using MIS. Immediate plough and plank the field after harvest of <i>Kharif</i> crops in order to conserve soil moisture and go for sowing of toria. Late sowing of wheat in mid December	
	Medium rainfall, Medium deep to Deep, loamy soils	Fellow-Wheat	Change in cropping system to Green fodder(Sorghum/bajra)/earl y pea (Arkel)-Toria	Ridge planting of Pea (Arkel). Harvest green fodder in 1 <sup>st</sup> week of Sept. Use rain water harvesting for irrigation	

			(Bhawani)-late sown wheat (HS490/ Raj3777/ HPW42).	using MIS. Immediate plough and plank the field after harvest of <i>Kharif</i> crops in order to conserve soil moisture and go for sowing of toria. Late sowing of wheat in mid December	
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Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Intercropping/mixed cropping: Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG-218, Him Mash-1)/ Sesame (LTK-4)	Re sowing (if germination below50%) with early maturity varieties, High seed rate (25% extra), Inter cropping, Furrow planting, If germination is more than 70% then apply vegetative mulch of locally available material, if plant population is more than 75% then go for gap filling, Hoeing by hand hoe to develop soil mulch for conservation of soil moisture.	Availability of seed of pulses from state Deptt. of Agriculture (ISOPOM) and Agriculture university
		Paddy (irrigated)-wheat	Paddy mostly grown in irrigated conditions	Gap filling	
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Intercropping/mixed cropping Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG-218, Him Mash-1)/ Sesame (LTK-4)	Re sowing (if germination below50%) with early maturity varieties, High seed rate (25% extra), Inter cropping, Furrow planting, If germination is more than 70% then apply vegetative mulch of locally available material	
	Medium rainfall, Medium deep to Deep, loamy soils	Maize-wheat	Intercropping/mixed cropping Maize + Soybean (Harit Soya/ Shivalik) /blackgram (UG-218, Him Mash-1) / Sesame (LTK-4)	Re sowing (if germination below50%) with early maturity varieties, High seed rate (25% extra), Inter cropping, Furrow planting, If germination is more than 70% then apply vegetative mulch of locally available material	

Condition	Suggested Contingency measures				
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Thinning (20%), Life saving irrigation if available, <i>In-situ</i> weed mulching	Inter-cultivation (soil mulching), Conservation Furrow, Foliar N management, Ridging in maize, don't use chemicals for weed management under stress	RKVY
		Paddy-wheat	Life saving irrigation	-	
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Thinning (20%), Life saving irrigation if available, <i>In-situ</i> weed mulching	Inter-cultivation (soil mulching), Conservation Furrow, Foliar N management, Earthing at 30-35 DAS, spray of Kaolin @5%, spray of 1000ppm thiourea, foliar spray of 2% urea in maize.	
		Maize-wheat	Thinning (20%), Life saving irrigation if available, <i>In-situ</i> weed mulching	Inter-cultivation (soil mulching), Conservation Furrow, Foliar N management	

Condition	Suggested Contingency measures				
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Harvest the crop for fodder If grain setting has occurred in maize, the tassels can be cut down to reduce transpiration, Life saving irrigation, if available	Urea spray (1%) or KCl spray, Use local available plant material for mulch	Farm ponds through IWSM programme
		Paddy (irrigated)-wheat	No Change	Irrigation at hair line stage to increase water use efficiency	

	Medium rainfall, Shallow, sandy soils	Maize-wheat	Harvest the crop for fodder If grain setting has occurred in maize, the tassels can be cut down to reduce transpiration, life saving irrigation, if available	Urea spray (1%) or KCl spray, Use local available plant material for mulch	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Harvest the crop for fodder If grain setting has occurred in maize, the tassels can be cut down to reduce transpiration, Life saving irrigation, if available, removal of lower leaves for fodder /mulch in maize, harvest maize for babycorn if market is available.	Urea spray (1%) or KCl spray, Use local available plant material for mulch	

<b>Condition</b>	<b>Suggested Contingency measures</b>				
<b>Terminal drought (Early withdrawal of monsoon)</b>	<b>Major Farming situation</b>	<b>Normal Crop/ cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
At flowering/ fruiting stage	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Harvest whatever crop is available and immediately conserve the soil moisture for <i>Rabi</i> crops.	Relay cropping of Gobhi Sarson (Neelam, Sheetal, ONK-1) in mid November in the Toria (Bhawani) sown during mid September, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for Sowing, Drill half N and full P before sowing with pora method.	Crop insurance and conservation of farm ponds under MGNREGA and RKVY
		Paddy-wheat			

	Medium rainfall, Shallow, sandy soils	Maize-wheat	Harvest whatever crop is available and immediately conserve the soil moisture for <i>Rabi</i> crops.	Relay cropping of Gobhi Sarson (Neelam, Sheetal, ONK-1) in mid November in the Toria (Bhawani) sown during mid September, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for Sowing, Drill half N and full P before sowing with pora method.	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Harvest whatever crop is available and immediately conserve the soil moisture for <i>Rabi</i>	Relay cropping of Gobhi Sarson (Neelam, Sheetal, ONK-1) in mid November in the Toria (Bhawani) sown during mid September, Deep sowing with minimum soil load on seed, Prefer pre-soaked seed for Sowing, Drill half N and full P before sowing with pora method. If late season rains are there <i>rabi</i> crops like taramera and toria can be sown.	

### 2.1.2 Rainfed situation (*Rabi* Crops)

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/ Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks (Normal onset 20 <sup>th</sup> August $\pm$ 31 days) Onset by 1 <sup>st</sup> week of January	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-Wheat	No change	No change. However, the farmers are advised to go for sowing of early varieties of wheat like VL 829 in the residual moisture conditions under rain fed conditions	Ensuring the availability of seeds in State Deptt of Agriculture, ISOPOM

	Medium rainfall, Shallow, sandy soils	Maize-Wheat	No change	No change. However, the farmers are advised to go for sowing of early varieties of wheat like VL 829 in the residual moisture conditions under rain fed conditions	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-Wheat	No change	No change. However, the farmers are advised to go for sowing of early varieties of wheat like VL 829 in the residual moisture conditions under rain fed conditions	

\*sowing of wheat crop is done through dry seeding and usually farmers do not wait for onset of rain.

<b>Condition</b>	<b>Suggested Contingency measures</b>				
<b>Early season drought (delayed onset)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Agronomic measures</b>	<b>Remarks on Implementation</b>
Delay by 4 weeks  Onset by 3 <sup>rd</sup> week of January	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-Wheat	Go for timely sown wheat varieties (HPW 211, HPW 251, VL-616, HS-277)	However, the farmers are being advised to go for sowing of early wheat like VL 829 in the residual moisture conditions under rainfed conditions	ISOPOM RKVY
	Medium rainfall, Shallow, sandy soils	Maize-Wheat	Go for timely sown wheat varieties (HPW 211, HPW 251, VL-616, HS-277)	However, the farmers are being advised to go for sowing of early wheat like VL 829 in the residual moisture conditions under rainfed conditions	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-Wheat	Go for timely sown wheat varieties (HPW 211, HPW 251, VL-616, HS-277)	However, the farmers are being advised to go for sowing of early wheat like VL 829 in the residual moisture conditions under rainfed conditions	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought(delayed onset) Delay by 6 weeks Onset by 1 <sup>st</sup> week of February	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Late sown wheat like VL 892, Raj 3777, HS 420; Change of crop to Mustard (KBS-3) / Gobhi Sarson (Sheetal, Neelam, ONK-1)	Increase seed rate by 25%	RKVY, ISOPOM
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Late sown wheat like VL 892, Raj 3777, HS 420; Change of crop to Mustard (KBS-3) / Gobhi Sarson (Sheetal, Neelam, ONK-1)	Increase seed rate by 25%	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Late sown wheat like VL 892, Raj 3777, HS 420; Change of crop to Mustard (KBS-3) / Gobhi Sarson (Sheetal, Neelam, ONK-1)	Increase seed rate by 25%	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 8 weeks Onset by 3 <sup>rd</sup> week of February	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Late sown wheat like VL 892, Raj 3777, HS420	Increase seed rate by 25%	RKVY
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Late sown wheat like VL 892, Raj 3777, HS420	Increase seed rate by 25%	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Late sown wheat like VL 892, Raj 3777, HS420	Increase seed rate by 25%	

<b>Condition</b>	<b>Suggested Contingency measures</b>				
<b>Early season drought (Normal onset)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Resowing if germination is <50%	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	Help for labour under MGNREGY
		Paddy-wheat	Resowing if germination is <50%	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Resowing if germination is <50%	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Resowing if germination is <50%	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	

<b>Condition</b>	<b>Suggested Contingency measures</b>				
<b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
At vegetative stage	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Resowing if germination is <50% with late sown varieties of wheat like VL 892, Raj 3777, HS 420	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	
		Paddy-wheat	Resowing if germination is <50%	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Resowing if germination is <50%	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	



	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Resowing if germination is <50%	Band placement of half N and full P and K at sowing, Weed Mulching, Hand racking for dust mulching	
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<b>Condition</b>	<b>Suggested Contingency measures</b>				
<b>Mid season drought (long dry spell)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
At flowering/ fruiting stage	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Grazing of the wheat crop by domestic cattle	-	
		Paddy-wheat	Grazing of the wheat crop by domestic cattle	-	
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Grazing of the wheat crop by domestic cattle	-	
	Medium rainfall, Medium deep to deep, loamy soils	Maize-wheat	Grazing of the wheat crop by domestic cattle	-	

<b>Condition</b>	<b>Suggested Contingency measures</b>				
<b>Terminal drought (Early withdrawal of monsoon)</b>	<b>Major Farming situation</b>	<b>Normal Crop/ cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
At flowering/ fruiting stage	Medium rainfall, Medium deep to deep, loamy-skeletal soils	Maize-wheat	Grazing of the wheat crop by domestic cattle		
		Paddy-wheat	Grazing of the wheat crop by domestic cattle		
	Medium rainfall, Shallow, sandy soils	Maize-wheat	Grazing of the wheat crop by domestic cattle		
	Medium rainfall, Medium deep to Deep, loamy soils	Maize-wheat	Grazing of the wheat crop by domestic cattle		

### 2.1.3 Drought - Irrigated situation (*Kharif* as well as *Rabi* crops)

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall					Not applicable

Condition	Suggested Contingency measures				
	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					Not applicable

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment					Not applicable

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop /cropping system	Change in crop/ cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient	Low land tank fed	Rice	Direct seeded rice, Rice varietal intervention (Sukara dhan-1, VL Dhan 221)	SRI planting, Foliar N management instead of Top N dress	ISOPOM/ State agriculture departments AEOS and

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop /cropping system	Change in crop/ cropping system	Agronomic measures	Remarks on Implementation
/delayed onset of monsoon		Maize	Maize early varieties (Bajaura makka, Vivek, HQPM1, Early Composite; Maize + soybean (Harit Soya/ Shivalik) or Maize + Black gram (UG218,Him Mash-1)	Intercropping	ADOs trainings by KVK, demonstrations, lectures and availability of seeds from university
		Wheat	Varietal improvement needed late sown varieties HS490,VL 892, Raj 3777 Wheat + Mustard (RCC 4) Wheat + Gobhi sarson (Neelam, Sheetal)	Irrigation only at critical stage (CRI, flowering and dough stage), Popularization of split application of N	
	Upland tank fed	Maize	Maize early varieties (Bajaura makka, Vivek, HQPM1, Early Composite; Maize + soybean (Harit Soya/ Shivalik) or Maize + Black gram (UG218, Him Mash-1)	Intercropping	ISOPOM, State agriculture departments AEOs and ADOs trainings by KVK, demonstrations, lectures and availability of seeds from university
		Wheat	Varietal improvement needed late sown varieties HS490,VL 892, Raj 3777 Wheat + Mustard (RCC4) Wheat + Gobhi sarson (Neelam), bed/ bidirectional sowing of wheat	Irrigation only at critical stage (CRI, flowering and dough stage), Popularization of split application of N	

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

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/ cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Tube well irrigation system	Paddy	Direct seeded rice, Rice varietal intervention (Sukara dhan-1, VL Dhan 221)	SRI planting, Foliar N management instead of top dressing of N	
		Wheat	No Change, Sowing of early maturing and drought resistant varieties.	Zero till sowing of wheat crop, Irrigation only sat critical stage (CRI, flowering and dough stage), keep weed free environment, <i>In-situ</i> mulching of weeds	

## 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				
Maize	Drainage and application of nitrogen if yellowing takes place. Earthing up of maize sown in rows. Intercultivation with wheel hoe/ hoe to improve the aeration and to control the weeds. Apply N at optimum moisture content.	Stalk rot control with bleaching powder, top dressing of N without mixing bleaching powder	Drainage and Cob harvesting from standing crop if physiologically mature	Storage at safer farmer warehouse/ tent covering the produce  After the harvest complete drying process has to be taken
Paddy	Strengthening of field bunds	Top dressing of N after draining of water	Water drainage	
Wheat	Additional dose of nitrogen (25kg/ha) to remove deficiency of nitrogen (yellowing) caused due to leaching, wherever possible run off may be harvested to make provision for protective irrigation at early stage of growth.	Complete drainage of water and control of Rust/Blight	Complete drainage of water	

<b>Horticulture</b>				
Mango	Drain excess water	Drain excess water	Drain excess water	Drain excess water
Pear	Drain excess water	Drain excess water	Drain excess water	Drain excess water
K.Lime	Drain excess water	Drain excess water	Drain excess water	Drain excess water
Galgal	Drain excess water	Drain excess water	Drain excess water	Drain excess water
Guava	Drain excess water	Drain excess water	Drain excess water	Drain excess water
<b>Heavy rainfall with high speed winds in a short span</b>				
Maize	Drain excess water	Drain excess water, Tie the fallen plants into bundles with the help of leaves	Drain excess water	Drain excess water
Paddy	Drain excess water	Drain excess water	Drain excess water	Drain excess water
Wheat	Drain excess water	Drain excess water	Drain excess water	Drain excess water
<b>Horticulture</b>				
Mango	Drain excess water	Drain excess water	Drain excess water	Drain excess water
Pear	Drain excess water	Drain excess water	Drain excess water	Drain excess water
K.Lime	Drain excess water	Drain excess water	Drain excess water	Drain excess water
Galgal	Drain excess water	Drain excess water	Drain excess water	Drain excess water
Guava	Drain excess water	Drain excess water	Drain excess water	Drain excess water
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Maize	Need based plant protection	Need based plant protection	Need based plant protection	Safe storage against storage pest and diseases
Paddy	IPDM	IPDM	IPDM	
Wheat	Leaf blight: ( Thiram 3 gm / kg of seed)	Karnal bunt: (Tilt 25 EC @200ml), Yellow rust (Feb) : (Tilt 25 EC @200ml)	Karnal bunt: Karnal bunt (Tilt 25 EC @200ml) Yellow rust (Feb): (Tilt 25 EC @200ml)	Safe storage against storage pest and diseases
<b>Horticulture</b>				
Mango	Need based plant protection	Need based plant protection	Need based plant protection	Need based plant protection
Pear	Need based plant protection	Need based plant protection	Need based plant protection	Need based plant protection
K.Lime	Need based plant protection	Need based plant protection	Need based plant protection	Need based plant protection
Galgal	Need based plant protection	Need based plant protection	Need based plant protection	Need based plant protection
Guava	Need based plant protection	Need based plant protection	Need based plant protection	Need based plant protection

### 2.3 Floods: Not experienced / encountered

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Horticulture	Not applicable			
Continuous submergence for more than 2 days				
Horticulture				
Sea water intrusion				

### 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
<b>Heat Wave</b>				
Maize	Mulching to buffer effect of high temp.	Continue weed mulching	<i>In-situ</i> weed mulching	Not applicable
Paddy	Light and repeated irrigation at the appearance of hair line cracks in soil surface, Correct iron deficiency with 0.5% iron sulphate spray.	Repeated irrigation at the appearance of hair line cracks in soil surface, pounding of water for 15 days after transplanting to check Fe deficiency and for crop establishment.	Repeated irrigation at the appearance of hairline cracks in soil surface	Harvest crop at physiological maturity
Wheat	Frequent and light irrigation	Not applicable	Frequent and light irrigation	Frequent and light irrigation
<b>Horticulture</b>				
Mango	Shade with wild bushes	Irrigation if available may be applied to combat the effect of high temperature	Irrigation if available may be applied to combat the effect of high temperature	Not applicable
Pear	Shade with wild bushes	Irrigation if available may be applied to combat the effect of high temperature	Irrigation if available may be applied to combat the effect of high temperature	Not applicable
K.Lime	Shade with wild bushes	Irrigation if available may be applied to combat the effect of high temperature	Irrigation if available may be applied to combat the effect of high temperature	Not applicable
Galgal	Shade with wild bushes	Irrigation if available may be applied to combat the effect of high temperature	Irrigation if available may be applied to combat the effect of high temperature	Not applicable
Guava	Shade with wild bushes	Irrigation if available may be applied to combat the effect of	Irrigation if available may be applied to combat the effect of high	Not applicable

		high temperature	temperature	
<b>Cold wave</b>				
Maize	Not applicable			
Paddy	Not applicable			
Wheat	Apply irrigation using sprinklers if available, smoking during night	Apply irrigation using sprinklers if available, smoking during night	Apply irrigation using sprinklers if available, Burning of crop residue around the crop, Spray of H <sub>2</sub> SO <sub>4</sub> @0.1%	Not applicable
<b>Horticulture</b>				Not applicable
Mango	Shade with wild bushes	Frequent irrigation, Apply irrigation using sprinklers if available	Frequent irrigation	Not applicable
Pear	Not applicable			
K.Lime	Not applicable			
Galgal	Not applicable			
Guava	Not applicable			
<b>Frost</b>				
Wheat	Apply irrigation using sprinklers if available, smoking during night	Apply irrigation using sprinklers if available, smoking during night	Apply irrigation using sprinklers if available, Burning of crop residue around the crop, Spray of H <sub>2</sub> SO <sub>4</sub> @0.1%	Not applicable
<b>Horticulture</b>				
Mango	Shade with wild bushes/ jute bags	Frequent irrigation, Apply irrigation using sprinklers if available	Not applicable	Not applicable
Pear	Not applicable			Not applicable
K.Lime	Not applicable			

Galgal	Not applicable		
Guava	Not applicable		
<b>Hailstorm</b>			
Paddy	Not applicable		
Wheat	Not applicable		
<b>Horticulture</b>			
Mango	Not applicable	Anti hail netting at fruit bearing stage/Anti hail guns installation at Departmental level	
Pear	Not applicable	Anti hail netting at fruit bearing stage/Anti hail guns installation at Departmental level	
K.Lime	Not applicable	Anti hail netting at fruit bearing stage/Anti hail guns installation at Departmental level	
Galgal	Not applicable	Anti hail netting at fruit bearing stage/Anti hail guns installation at Departmental level	
Guava	Not applicable	Anti hail netting at fruit bearing stage/Anti hail guns installation at Departmental level	
<b>Cyclone</b>			
Maize	Not applicable	Sell the green cobs in local market	Harvest the produce manually
Paddy	Not applicable	Not available	Harvest the produce manually
Wheat	Not applicable	Not available	Harvest the produce manually
<b>Horticulture</b>			
Mango	Not applicable	Sell the dropped fruits for post harvest use like pickle making	Ripen the dropped fruits artificially
Pear	Not applicable		Ripen the dropped fruits artificially
K.Lime	Not applicable		Ripen the dropped fruits artificially
Galgal	Not applicable		Ripen the dropped fruits artificially
Guava	Not applicable		Ripen the dropped fruits artificially



## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	Insurance of livestock, Migrate to the areas where there is sufficient fodder available, Encourage perennial fodder on bunds and waste land on community basis , Establishing fodder banks, Encouraging fodder crops in irrigated area , Preparation of hay, Silage – using excess fodder for silage	Utilizing fodder from perennial trees and Fodder bank reserves, Complete feed block, Utilizing fodder stored in silos, Transporting excess fodder from adjoining districts, Use of feed mixtures, Using fodder from scarcity fodder trees.	Availing Insurance, Culling unproductive/ diseased livestock and replace with healthy livestock, Provide green fodder as per recommended rates.
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply, Identification of water resources, De-silting of ponds, Rain water harvesting and create water bodies/ watering points (when water is scarce use only as drinking water for animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations	Adequate supply of drinking water, Restrict wallowing of animals in water bodies/resources, Add alum in stagnated water bodies	Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources Provide clean drinking water, Efforts to rejuvenate the water resources
Health and disease management	Procure and stock emergency, medicines and vaccines for important endemic diseases of the area, All the stock must be immunized for endemic diseases of the area, Surveillance and disease monitoring network to be established at Deputy Director (Animal Husbandry) office in the district, Adequate refreshment training on draught	Carryout de-worming to all animals entering into relief camps, Identification and isolation of sick animals, Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak, Restricting movement of livestock in case of any epidemic, Tick control measures be undertaken to prevent tick borne diseases in animals,	Keep close surveillance on disease outbreak, Undertake the vaccination depending on need, Keep the animal houses clean and spray disinfectants, Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide

	management to be given to VOs, Vet Pharmacists with regard to health & management measures, Procure and stock multivitamins & area specific mineral mixture, Strict vigil on movement of animals from the neighbouring states, Possibility of establishing quarantine quarters/sheds at boarders	Rescue of sick and injured animals and their treatment, Organize with community, daily lifting of dung from relief camps.	with mid summer.
<b>Floods</b>	Not applicable		
Feed and fodder availability			
Drinking water			
Health and disease management			
<b>Cyclone</b>	The short duration event of cyclones did not affect animal health as such		
Feed and fodder availability	Not applicable		
Drinking water	Not applicable		
Health and disease management	Not applicable		
<b>Heat wave and cold wave</b>			
Shelter/environment management	Animal to be shifted from high hill pasture lands to nearby pastures ; restricted open grazing	Group housing, feeding during cooler hours, Stationary conditions in cowsheds , group living, dry grass flooring, gunny bags on windows, gunny bags wrapped on the belly of milking animals, restricted open grazing during sunny days only	Open grazing, grazing in open sun , massage of milking animals and other species.
Health and disease management	Traditional herbs fed to animals, Use of Immuno-modulators.	Provision of fans/shade during warm waves and cold drinking water, provision of warm housing during cold waves, Use of Immuno-modulators.	Open grazing in sunny days and feeding of medicinal herbs. In case of acute problem prompt veterinary care, Use of multi vitamins& multimineral, Use of Immuno-modulators

### 2.5.2 Poultry

Poultry	Suggested contingency measures	Convergence/ linkages
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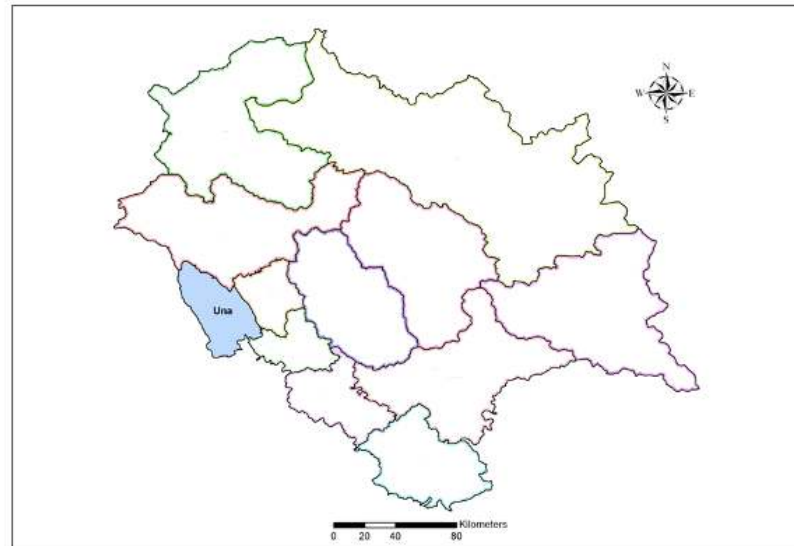
	<b>Before the event</b>	<b>During the event</b>	<b>After the event</b>	<b>with ongoing programs, if any</b>
<b>Drought</b>				
Shortage of feed ingredients	Insurance, Establishing feed reserve Bank	Utilizing from feed reserve banks	Availing insurance Strengthening feed Reserve Banks	
Drinking water	Roof top rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement	
Health and disease management	Culling of sick birds. De-worming and vaccination against infectious and contagious diseases, & other emerging bacterial and viral pathogens	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water	Hygienic and sanitation of poultry house, Disposal of dead birds by burning / burying with lime powder in pit	
<b>Floods</b>				
Shortage of feed ingredients	Not applicable			
Drinking water				
Health and disease management				
<b>Cyclone</b>				
Shortage of feed ingredients	Not applicable			
Drinking water				
Health and disease management				
<b>Heat wave and cold wave</b>				
Shelter/environment management	Adequate ventilation during night in summer and adequate protection from cold during winter.			
Health and disease management	Appropriate supplements be available and additional care to keep the diseases at bay.			

### 2.5.3 Fisheries/ Aquaculture

	<b>Suggested contingency measures</b>		
	<b>Before the event</b>	<b>During the event</b>	<b>After the event</b>
1) Drought	Insurance, puddling of earthen tanks to reduce percolation losses. Lining of earthen Tanks with plastic sheet	Try to maintain water the rain fed tanks artificially	Avail insurance Clean the tanks off dead fish

2) Floods	Not applicable
3) Cyclone / Tsunami	
4) Heat wave and cold wave	

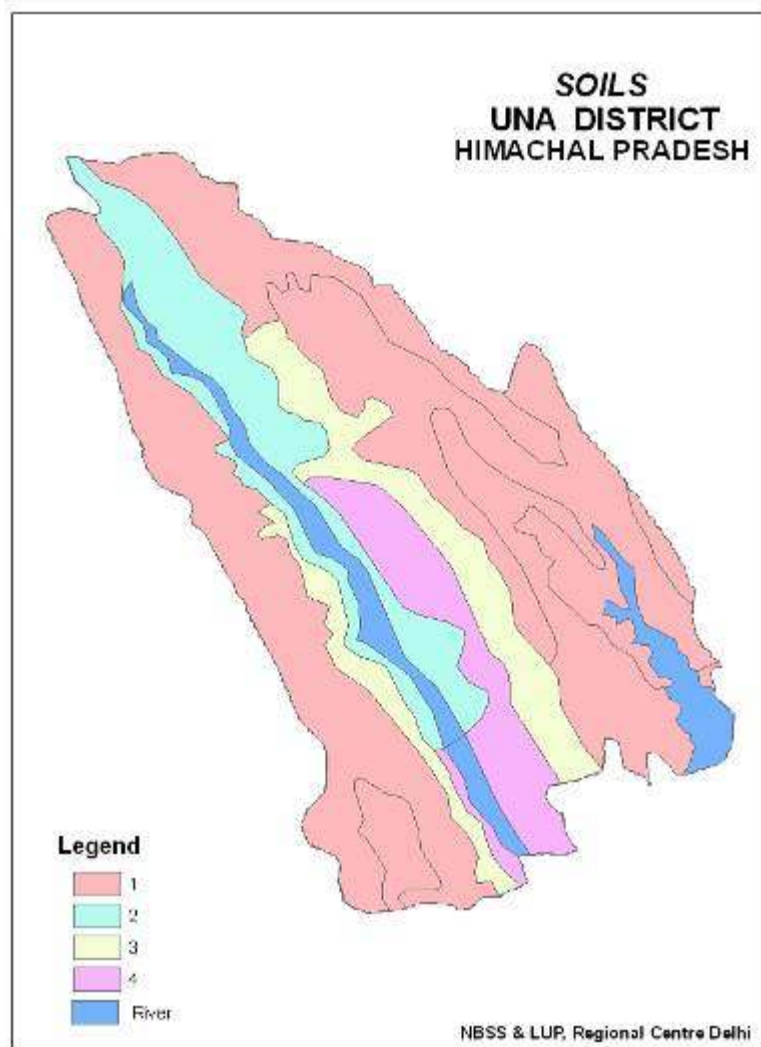
**Annexure 1. Location map**



**Annexure 2. Mean annual rainfall (mm)**

<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Annual</b>
<b>2006</b>	15.4	1.3	32.8	14.3	83.8	146.9	310.5	507.4	138.7	23.8	4.5	26.5	1305.9
<b>2007</b>	0.0	98.1	127.0	25.3	15.3	133.4	244.1	506.9	91.5	1.6	0.0	12.3	1255.5
<b>2008</b>	16.3	14.2	0.0	18.0	12.2	299.5	396.7	525.2	90.4	36.7	0.0	0.5	1409.7
<b>2009</b>	14.6	45.0	44.4	31.2	23.7	47.0	290.7	390.9	83.0	20.6	23.9	0.0	1015.0
<b>2010</b>	10.8	38.4	2.4	1.3	52.4	79.5	270.4	409.6	217.9	35.1	5.8	58.7	1182.3
<b>2011</b>	32.4	124.2	42.7	26.9	52.4	166.9	176.4	441.7	203.5	17.8	0.0	9.2	1294.1
<b>2012</b>	111.1	20.7	11.6	50.9	0.6	31.1	201.9						427.9
<b>Mean</b>													1127.2

Annexure 3. Soil map



New Soil Unit	Description	Area ('000 ha)
0	Water Bodies / River	14
<b>SOILS OF SIDE / REPOSED SLOPES</b>		
1	Medium deep to deep, loamy-skeletal soils moderate to severe erosion; <i>associated with:</i> Loamy soils with moderate erosion	106
<b>SOILS OF FLUVIAL VALLEY</b>		
2	Shallow, sandy soils with moderate erosion; <i>associated with:</i> Loamy soils	14
<b>SOILS OF PIEDMONT PLAINS</b>		
3	Deep, loamy soils with moderate to severe erosion; <i>associated with:</i> Medium deep soils	12
4	Medium deep, loamy soils with slight to moderate erosion; <i>associated with:</i> Deep soils	9
<b>Total area</b>		<b>140</b>