State: HIMACHAL PRADESH

Agriculture Contingency Plan for District: BILASPUR

1.0 District Agriculture profile				
1.1	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- mountain and low hills, Sub-Tropical (HP-1)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Solan, Una, Hamirpur and Mandi		
	Geographic coordinates of district	Latitude	Longitude	Altitude (m)
		31° 12' 30" to 31° 35' 45" N	76° 23' 45" To76° 55' 40" E	290 to 1980
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Sub Station , Berthin, Distt. Bilaspur (HP) 174 029		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Bilaspur (Berthin), Himachal Pradesh- 174 029 Phone 01978-267194 (O), Email: kvkbilaspur@gmail.com		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Department of Agronomy, Forages and Grassland Management, Palampur,176 062, CSKHPKV Palampur		

*Source: District Agriculture Plan, Bilaspur Himachal Pradesh, Volume-I Department of Agriculture (H.P.) Consulting agency, CSK HPAU, Palampur-176 062

1.2	**Rainfall**	Average (mm)	Normal on set	Normal cessation
	SW monsoon (June – September)	803	3rd week of June	1st week of September
	NE Monsoon (October – December)	46	3rd week of December	4th week of December
	Winter (Jan – Feb)	80		
	Summer(March– May)	118		
	Annual	1047		

1.3 Land use pattern of the district

1.3	Land use pattern of the district (latest statistics)	Geographical area	Net sown area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	116.7	31	14	14.9	38.5	6.2	0.1	4.4	1.7	1.1

* Source: Statistical outline of Himachal Pradesh, 2008-09

1.4 Major soils

Soils	Description	Area ('000 ha)	Percent area
1	Shallow to medium deep, loamy soils	1.7	1.5
2	Medium deep to deep loamy soils	3.1	2.7
3	Medium deep to deep, loamy-skeletal soils	95.7	85.3
4	Medium deep, loamy, calcareous soils	4.6	4.2
5	Shallow, sandy soils	4.2	3.7
6&7	Deep, loamy soils	1.35	2.1
8	Medium deep, loamy soils	1.5	1.3

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity (%)
	Net sown area	31.0	185%
	Area sown more than once	26.3	
	Gross cropped area	57.3	

* Source: Strategic Research and Extension Plan of Bilaspur District, National Institute of Agricultural Extension Management Rajendranagar, Hyderabad-500 030. A.P., INDIA

1.6	Irrigation	Area ('000 ha)
	Net irrigated area	3.2

	Gross irrigated area			
	Rainfed area			
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals			
	Tanks			
	Tube wells			
	Bore wells			
	Other wells			
	Lift irrigation schemes	61		
	Micro-irrigation			
	Other sources :			
	Kuhls			
	Khatris			
	Total Irrigated Area		3.2	10.2 %
	Pump sets			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/	(%) area	Quality of water
	Over exploited			
	Critical			
	Semi- critical			
	Safe			good
	Wastewater availability and use			
	Ground water quality	Good, EC<750m mhos/cm at 25^0 C		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

*Source: District Agriculture Plan Bilaspur Himachal Pradesh Volume-I Department of Agriculture (H.P.) Consulting agency CSK Himachal Pradesh Agricultural University Palampur-176 062

1.7 Area under major field crops & horticulture

Sr. No.	**Major field crops**	**Area (‘000 ha)**		
		Total	**Irrigated**	**Rainfed**

	Maize	27.0		27.0
	Wheat	25.2		
	Rice	1.4	0.14	1.2
	Barley	0.2		0.2
	Pulses	0.24		0.24
	Blackgram	0.53		0.53
	Chickpea	0.3		0.3
	Toria	0.35		0.35
	Sesame	0.25		0.25
	Gobhi sarson	0.01		0.01
	Horticultural Crops			
	Mango	3.8		
	Citrus	1.11		
	Litchi	0.17		
	Amla	0.06		
	Plum	0.14		
	Pear	0.56		
	Peach	0.15		
	Pomegranate	0.07		
	Others fruits	5.3		
	Other Vegetables	**Total Area**		
	Tomato	0.8		
	Bhendi	0.2		
	Onion	0.16		
	Cauliflower	0.13		
	Garlic	0.12		
	Peas (Green)	0.09		
	Beans	0.07		
	Cabbage	0.03		
	Raddish, Turnip & Carrot	0.09		
	Cucurbits	0.16		
	Capsicum	0.05		

	Chillies	0.04	
	Brinjal	0.04	
	Ginger	0.07	
	Colocasia	0.08	
	Zimikand	0.03	
	Other vegetables	0.23	

*Source: District Agriculture Plan Bilaspur Himachal Pradesh Volume-I Department of Agriculture (H.P.) consulting agency CSK Himachal Pradesh Agricultural University Palampur-176 062

1.8	**Type of animals**	**Status**	**Number ('000)**
	Crossbred Cattle	Male	6.5
		Female	14.5
	Indigenous Cattle	Male	28.8
		Female	3.9
	Total Cattle		53.9
	Buffalos	Male	5.3
		Female	92.4
	Sheep	Crossbred	0.8
		Indigenous	2.2
	Goats		52.8
	Pack animals (Horses, ponies, mules, donkeys)		0.4
	Total Livestock		261.7

1.9	Poultry		106.6

1.10	**Inland Fisheries**			
		Water Spread Area (ha)	**Yield (t/ha)**	**Production (tons)**
	i) Brackish water/Ponds	16.3	4565	46.6
	ii) Fresh water			
	Total area estimated	16132		

1.11 Production and Productivity of major crops

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
	Maize	49.8						49.8		
	Rice	1.9						1.9		
	Pulses	0.3						0.3		
	Chickpea	2.5						2.5		
	Blackgram	3.1	5					3.1	5	
	Toria	2.8	5					2.8	5	
	Sesame	0.4	3					0.4	3	
	Wheat			62.8	16			62.8	16	
	Barley			294	12			294	12	
	Sarson			723	5			723	5	
	Horticulture									
	Mango	2.7	7					2.7	7	
	Amla	0.03	5					0.03	5	
	Litchi	0.03	5					0.03	5	
	Plum	0.014	1					0.014	1	
	Citrus	0.4	4					0.4	4	
	Potato			2792	129			2792	129	
	Bhendi	10.5						10.5		

	Cauliflower			11363					11363	
	Cucumber	12.5						12.5		
	Tomato	19.9						19.9		
	Onoin			6410				6410		
	Peas			59.6	78			59.6	78	

*Source: District Agriculture Plan Bilaspur Himachal Pradesh Volume-I Department of Agriculture (H.P.) consulting agency CSK Himachal Pradesh Agricultural University Palampur-176 062

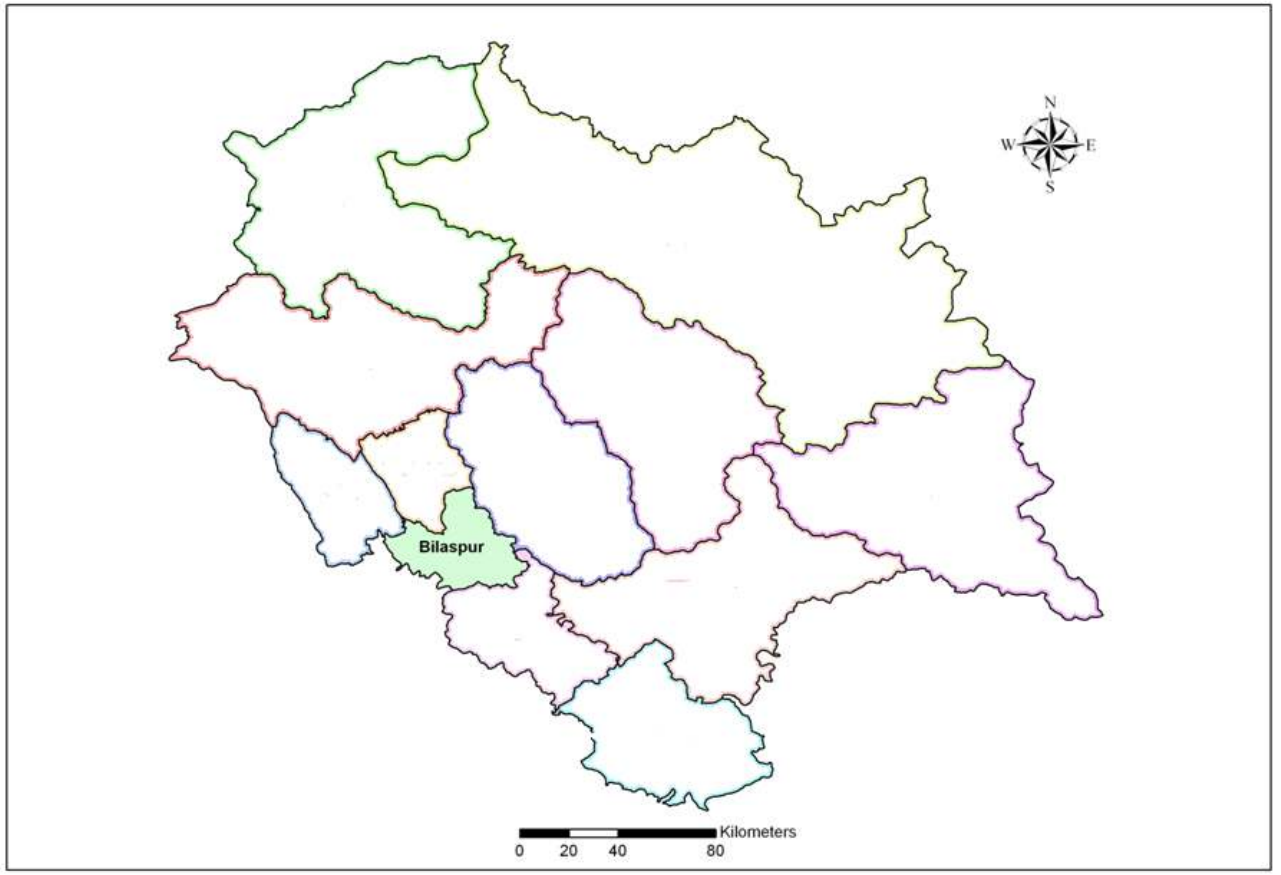
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Maize**	**Wheat**	**Rice**
	Kharif - Rainfed	2nd week of June (*Kharif*) to 1st week of July (late *Kharif*)		
	Kharif -Irrigated			2nd week of June to 1st week of July
	Rabi- Rain fed		2nd week of October to 2nd week of January	
	Rabi-Irrigated		1st week of November to 2nd week of December	

What is the major contingency the district is prone to? (Tick mark)	**Regular**	**Occasional**	**None**
Drought	√		
Flood			√
Cyclone			√
Hail storm		√	
Heat wave	√		
Cold wave	√		

Frost	√		
Sea water intrusion			√
Pests and disease outbreak (Borers, Fungal, Bacterial and Viral diseases)	√		

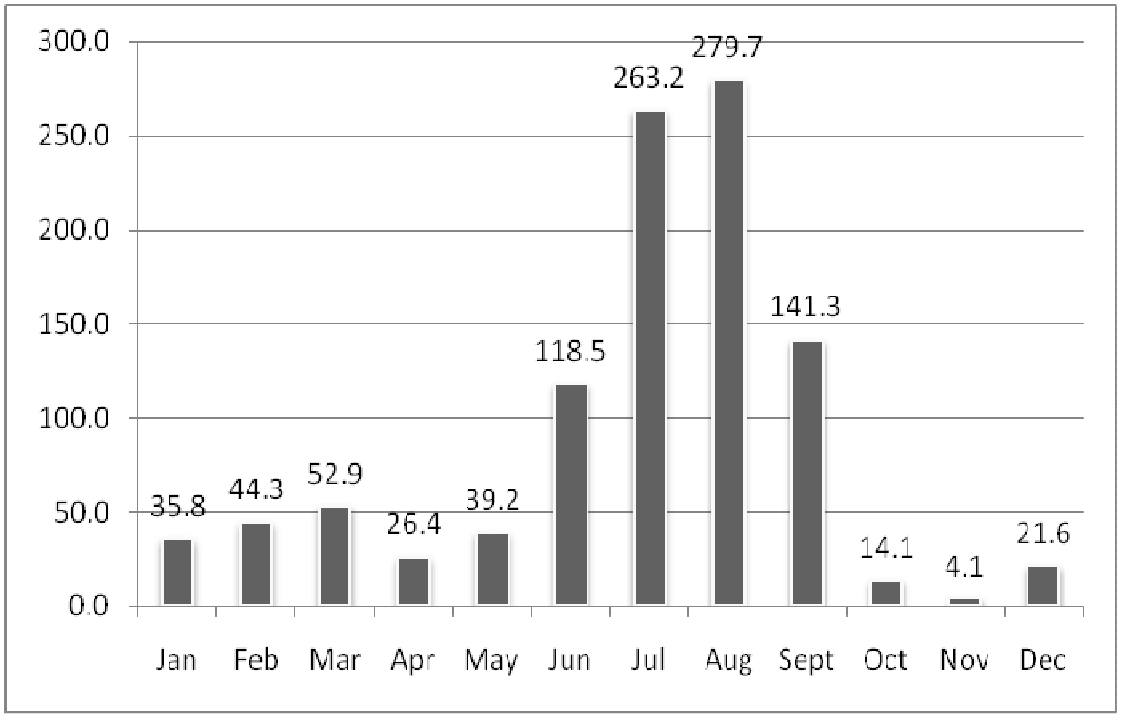
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure II	Enclosed: Yes
		Soil map as Annexure III	Enclosed: Yes

Annexure I. Location map of district

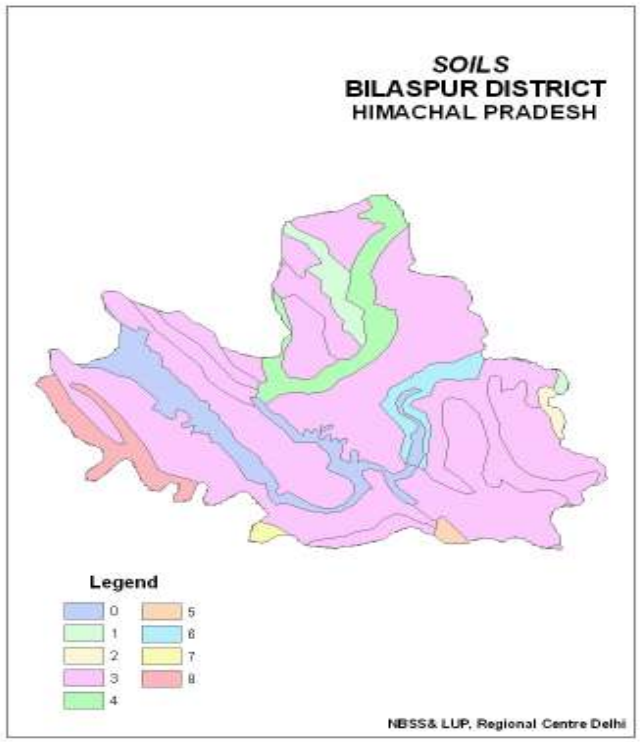


Annexure II

Mean annual rainfall (mm)



Annexure III. Soil map



New Soil Unit	Description	Area (ha)	Percent area
1	Shallow to medium deep, loamy soils	1.7	1.5
2	Medium deep to deep loamy soils	3.1	2.7
3	Medium deep to deep, loamy-skeletal soils	95.7	85.3
4	Medium deep, loamy, calcareous soils	4.6	4.2
5	Shallow, sandy soils	4.1	3.7
6&7	Deep, loamy soils	1.3	2.1
8	Medium deep, loamy soils	1.5	1.3

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rain fed situation

Condition	**Suggested Contingency measures**				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/ cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks 1st week of July	Shallow to deep loamy soils	Maize	Maize		
			Maize + Soybean (Harit Soya/ Shiwalik)/ Blackgram (UG 218, Him Mash-1) /Sesame (LTK-4)		
		Rice	Rice (direct seeded)		
			Maize		
1st week of January		Wheat	Wheat		
			Wheat + Mustard/Gobhi sarson		

Condition	**Suggested contingency measures**				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks 3rd week of July	Shallow to deep loamy soils	Maize	Maize + Cowpea / mash / soybean / sesame	Good drainage	Seed supply through State Department of Agriculture, NSC, SAU
			Blackgram (Him mash-1, UG-218)		
		Rice (Transplanted/ Direct seeded)	Blackgram	Sow blackgram on raised seed beds with good drainage	
		Wheat	Barley (HBL276/Dolma),	Increase the seed rate and	

3rd week of January			Oats (PLP1/Kent) , Wheat (late sown-HS295/Raj3777/HPW42)	fertilizer by 25%	

Condition	**Suggested contingency measures**				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 1st week of August	Shallow to deep loamy soils	Maize	Kharif Onion (N-53, Agri Found Dark Red) / Early Cauliflower/ Bajra(Chari)	Increase seed rate by 20% and reduce spacing of 30 cm	Seed supply through State Department of Agriculture, NSC, SAU, RKVY, ISOPOM
		Rice (Direct seeded)	Maize +Bajra (fodder purpose) / Cow pea		
1st week of February		Wheat	Oats (PLP1) / Barley (Dolma)		

Condition	**Suggested contingency measures**				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks 3rd week of August	Shallow to deep loamy soils	Maize	Green fodder (Chari/Bajra)	Increase seed rate by 20% and reduce the spacing upto 30 cm	Seed supply through State Department of Agriculture, NSC, SAU
			Radish (Early) Japanese White/ French bean (Contender) / Cauliflower (Megha/Shweta)/ Peas (Mater Ageta/Azad Pea 1)		
		Rice (Direct seeded)	Green fodder (Chari)/ Radish (Early) Japanese White / French bean (Contender)/Cauliflower (Megha/ Sweta)/Peas (Azad Pea 1) , Toria		
3rd week of February		Wheat	Potato/ Onion		

Condition	Suggested contingency measures				
Early season drought (Normal onset)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	1. Upland	Maize	Gap filling with improved variety if population is >50% otherwise re- sowing with10% higher seed rate or Intercropping/mixed cropping of black gram/cowpea/sesame in rows	• Sowing of the crop across the slope • Formation of ridges and furrows • Mulching in crop if no intercrop is taken • Top dressing of 20-30 kg N/ha after relief of moisture stress • Keep the crop weeds free	Seed supply through State Department of Agriculture, NSC, SAU
		Rice (Transplanted)	Gap filling if plant population is more than 75% , otherwise do replanting	• Topdressing of N in rain-fed crop coinciding with rain splashes • Rain water harvesting of surrounding fields, keep the crop weeds free	
		Rice (Direct seeded)	Gap filling if population is >50% of optimum, otherwise re-sowing with 25% more seed rate		
		Wheat	If germination < 50% go for re sowing with 25% more seed rate or mixed cropping with *Brassica (*RCC4) (25% recommended seed rate of mustard)		
		Barley	If germination below 50% go for re sowing with 25% more seed rate or shift of crop as fodder		
	2. Lowland	Rice (Transplanted)	Gap filling or split the tillers from surviving hills		

Condition	Suggested contingency measures				
Mid season drought (long dry spell, consecutive	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measure**	**Remarks on Implementation**

2 weeks rainless (>2.5 mm) period)					
At vegetative stage	1. Upland	Maize	Remove 10-20% stand, weeding and intercultural operations frequently to use soil as mulch	• Mulching within the crop rows	Seed supply through State Department of Agriculture, NSC, SAU
		Rice(transplanted)	Weeding	• Foliar spray of urea 2% during the dry spell • Mulching within the crop rows • Life saving irrigation with rain water stored in water harvesting structures from adjoining places	
		Rice (direct seeded)	Reduce population by 10-20%, weeding and inter culture to make a soil mulch condition	• Foliar spray of urea 2% during the dry spell	
		Wheat	Reduce population, weeding	• Life saving irrigation with rain water stored in water harvesting structures from adjoining places	
	2. Low land	Rice	Reduce population, weeding	• Foliar spray of urea 2% during the dry spell	

Condition	**Suggested contingency measures**				
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measure**	**Remarks on Implementation**
Reproductive phase	1. Upland	Maize	Keep the fields free from weeds	• Foliar spray of 2% urea during the dry spell, • Life saving irrigation from water harvesting structures • Top dressing of 20-30 kg N/ha after relief of dry spell	

				• Mulching in crop rows if possible • Dust mulch through frequent inter culture	
		Rice (Transplanted &direct seeded)		• Foliar spray of 2% urea during the dry spell • Life saving irrigation from water harvesting structures • Top dressing of 20-30 kg N/ha after relief of dry spell • Mulching in crop rows if possible • Dust mulch through frequent inter culture	
		Wheat		• Foliar spray 2% of urea during the dry spell • Life saving irrigation from water harvesting structures if possible	
		Blackgram	Weeding, pest control	• Life saving irrigation • Create soil mulch through interculture	
		Chickpea	Weeding, pest control	• Life saving irrigation • Create soil mulch through interculture	

Condition	**Suggested contingency measures**				
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
		Maize	Life saving irrigation	Sowing of Toria/Gobhi sarson/radish/Peas in good moisture from last rains or in areas where drought is expected quite often then go for early wheat varieties VL616/VL829/HPW251	
		Rice		Sowing of Radish/Peas/Toria as catch crop followed by wheat or in areas where drought is expected quite often then go for early wheat varieties VL829/HPW251	
		Wheat		Prepare land for sowing of Kharif crop	
		Blackgram		Sowing of early wheat varieties (VL829/HPW251) OR Toria/Toria+Gobhi sarson	

2.1.2 Drought- Irrigated situation

Condition	Suggested contingency measures				
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed/ limited release of water in canals due to low rainfall		Maize	Maize + soybean or Maize + Blackgram	• Maize early varieties (early composite), Mulching in crop rows • Ridge and furrow planting • Irrigation at crtical crop growth stages • Alternate furrow or micro- irrigation systems like sprinkler	
		Rice	Direct seeded rice, (HPR 1156/HPR1028 Sukhara dhan/ VL421	SRI planting, Foliar N in the form of urea 2%	
		Wheat	Wheat (HS490, VL982 Raj.3777), Wheat + Mustard, Wheat + Gobhi sarson (Neelam)	• Irrigation only at critical stage (CRI, flowering and dough stage) • Popularization of split application of nitrogen	

Condition	Suggested contingency measures				
	Major Farming situatio	**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				
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Not applicable				

Insufficient groundwater recharge due to low rainfall	Not applicable

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Rice	Strengthening of field bunds, Drain out the excess water, Topdressing of 20-30 kg N/ha afte removal of excess water, Micro nutrient deficiency correction for Zinc and Fe if need arises	Drain out the excess water, Top dressing of N after water draining, Spray $ZnSO_4$ 0.2% if it is less than 45 days	Drain out the excess water, Harvest the crop at physiological maturity	Storage at warehouse, Covering of produce with polythene sheet Spray common salt at 5% on panicles to prevent germination and spoilage of straw from moulds
Maize	Drain out the excess water as early as possible, Apply 20 kg N + 10 kg K /ha after draining excess water, Inter cultivation Loosen and aerate the soil at optimum soil conditions Weeding, Earthing up ,	Stalk rot control with Calcium Hypochlorite(bleaching powder), top dressing of N but do not mix bleaching powder	Drainage and Cob harvesting from standing crop if physiologically mature	Storage at warehouse, Covering of produce with polythene sheet
Wheat	Drain out the excess water, Add additional dose of nitrogen (25kg/ha)	Complete drainage of water, Control of yellow rust with 0.1% Propiconazole	Complete drainage of water	If rains are continuing take to safe storage place and before winnowing ensure that the moisture is 12-14%
Blackgram	Drain out the excess water, Control of anthracnose with Mancozeb @0.25%	Drain out the excess water,	Provide drainage and selective pod harvest	Storage at warehouse, Covering of produce with polythene sheet
Chickpea	Drain out the excess water		Drain out the excess water	Storage at warehouse, Covering of produce with polythene

				sheet
Horticulture				
Colocasia	Drain out the excess water	Drain out the excess water , Control of leaf spots and rhizome rot	Drain out the excess water and control of leaf spots and rhizome rot	Take out the rhizomes before storage and sort out the rotten ones and dry in sun
Cauliflower	Drain out the excess water, Split dose of nitrogen when the sky is clear	Drain out the excess water, Use of NPK mixture spray	Drain out the excess water, Control Head rot disease, Harvest the heads which are ready Take off the infested leaves in fields	Immediately market the heads which are ready
Okra	Drain out the excess water, Application of nitrogen	Drain out the excess water,	Drain out the excess water and harvest at physiological maturity	
Cucumber	Drain out the excess water from the base of the plants	Drain out excess water from the base of the plants	Drain out the excess water from the base of the plants,	Storage and immediate transport to market
Onion	Drain out the excess water , Top dressing of 20-30 kg N/ha after relief of excess water	Drain out the excess water, Top dressing of 20-30 kg N/ha after relief of excess water	Drain out the excess water,	Storage and immediate transport to market
Peas	Complete drainage of fields, Seed treatment with Carbendazim @ 2.5g/kg seed for Ashcochyta blight control	Spray of Carbendazim @ 1g/L or Mancozeb 75 WP @ 2.5g/litre of water for Ashcochyta blight, Provide staking	Drainage of fields Spray of Dinocap @5ml or Carbendazim @5g in 10 litres of water for powdery mildew , Harvesting to be delayed till a clear weather	Do not harvest if pods are wet
Heavy rainfall with high speed winds in a short span				
Rice	Strengthening of field bunds	Top dressing of N after draining		Storage at warehouse,

		water		Covering of produce with polythene sheet
Maize	Drain out the excess water , Earthing up operation, Interculture to improve aeration of soil and to control weeds Application of 20-30 kg nitrogen per ha if yellowing takes place	Earthing up and stalking by tying two to three plants together, Stalk rot control with Calcium Hypochlorite (bleaching powder) @ 16.5 kg /ha Top dressing of N, but do not mix bleaching powder	Drain out the excess water Cob harvesting from standing crop if physiologically mature	Storage at warehouse, Covering of produce with polythene sheet
Wheat	Drain out excess water with proper drainage, Interculture to improve aeration of soil and to control weeds, Additional dose of nitrogen (25kg/ha) to remove deficiency of nitrogen (yellowing) caused due to leaching	Complete drainage of water and control of yellow rust with Propiconazole @ 0.1%	Complete drainage of water	After the harvest complete drying process has to be taken to ensure that the fungus development has not taken on the seeds and if rains are continuing take to safe storage place and before winnowing ensure that the moisture is 12-14%
Blackgram	Drain out excess water with proper drainage, Interculture to improve aeration of soil and to control weeds, Control of anthracnose with Mancozeb @ 0.25%	Disease control with Copper oxy chloride/ Mancozeb@ 0.25%, Interculture to improve aeration of soil and to control weeds	Drain out the excess water, Selective pod harvest	Storage at warehouse, Covering of produce with polythene sheet
Chickpea	Drain out excess water, Spray 2% urea to reduce yellowing, Interculture to improve aeration of soil and to control weeds			
Vegetables				
Colocasia	Drain out the excess water, Top dressing of nutrients after removal of excess water		Field drainage and control of leaf spots with Metalaxyl @ 2.5 g/litre of water	Take out the rhizomes, before storage sort out the rotten ones and dry in sun
Cauliflower	Drain out the excess water, Spray of Mancozeb @ 2.5g/L of water and Carbendazim @ 5g/10L for wilting		For Head rot control drainage of fields and preventive spray of Mancozeb @2.5g/L and streptocyclin@1g/L of	Immediately market the heads which are ready

			water and harvest the heads which are ready	
Okra	Drainage and sanitation	Drain the fields, Drench with Carbendazim @ 2.5g/L and Streptocyclin @ 1g/L for virus control	Field drainage and harvesting	Transport the produce with care that the moisture is not too high while packing
Cucumber	Drainage of excess water	For Fruit fly attack use Pheromone traps or Malathion 50EC spray with 50g gur @ 1ml/litre of water Sanitaion	Field drainage	Storage and immediate transportation to market
Onion	Drain out the excess water, For wilting, use Mancozeb @ 2.5g/L of water	For wilting, use Mancozeb @ 2.5g/L of water	Field drainage	Storage and immediate transportation to market
Peas	Complete drainage of fields, To prevent Ashcochyta blight seed treatment with Carbendazim @ 2.5g/kg seed,spray of Carbendazim @ 1g/L or Mancozeb 75 wp @ 2.5g/litre of water.	Complete drainage of fields, For Ashcochyta blight, seed treatment with Carbendazim @ 2.5g/kg seed or spray of Carbendazim @ 1g/L or Mancozeb 75 wp @ 2.5g/L of water.	Drainage of fields, Spray of Dinocap @5ml or Carbendazim @5g in 10 litres of water for powdery mildew and harvesting be delayed till a clear weather	Do not harvest the pods if they are wet
Outbreak of pests and diseases due to unseasonal rains				
Rice	Seed treatment with Carbendazim 50wp or Tricyclazole 75 wp @ 2.5 g /kg seed for leaf blast control,			Storage at warehouse, Covering of produce with polythene sheet , dry the produce up to 10-12% moisture
Maize		Stalk rot control through Calcium Hypochlorite (bleaching powder) @ 16.5 kg /ha, leaf blight control through Mancozeb @0.25%	Stalk rot control through Calcium Hypochlorite (bleaching powder) @ 16.5 kg /ha	Storage at warehouse, Covering of produce with polythene sheet , dry the produce up to 10-12% moisture
Wheat	Spray Chlorpyriphos 20 EC @ 0.05% at the time of sowing for control of termites in fields	Complete drainage of water and control of yellow rust with Propiconazole @ 0.1%	Loose smut control with Propiconazole 25 EC @ 0.01%	Storage at warehouse, Covering of produce with polythene sheet , dry the produce up to 10-12%

Chickpea	Provide drainage	Control pod borer with Carbaryl @ 2ml/l water	Control pod borer with Carbaryl @ 2ml/l water	moisture
Blackgram	Provide drainage, apply preventive spray of Mancozeb @ 0.25% for blight control	Provide drainage, preventive spray of Mancozeb @ 0.25% for blight control, Control blister beetle with Carbaryl @ 2ml/L water	To protect the crop from leaf spot, apply preventive spray of Mancozeb @ 0.25% for blight	
Vegetables				
Peas	For seed rot control : Drench with Carbendazim and spray of Mancozeb @ 0.25%	Drenching with Carbendazim /Spray of Mancozeb/Metalaxyl as preventive spray @ 0.25%	Spay of Contaf 2g/l water for powdery mildew control	Market after grading only
Cauliflower/Cabbage	Copper oxy chloride/Mancozeb@ 0.25% as preventive spray		Head rot control with Copper oxy chloride /Mancozeb @ 0.25% as preventive spray and remove diseased leaves, remove the rotten heads,	Immediately harvest the heads
Okra (Kharif)	Provide drainage	Control blister beetle with Carbaryl @ 2g/l water		Storage and immediate transport to market
Cucurbits (Kharif)	Control pumpkin beetle with Carbaryl @ 2g/L water	Carbendazim @ 1g/L for control of foliar diseases, For control of fruit fly installation of pheromone traps along with spray of Malathion @ 1ml/L water plus 5 g gur	-	Storage and immediate transport to market

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days[2]	Not applicable			
Sea water intrusion[3]	Not applicable			

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]		Not available		
Maize	Irrigation if available may be applied to combat the effect of high temperature			
Wheat	Irrigation if available may be applied to combat the effect of high temperature			
Mustard	Irrigation if available may be applied to combat the effect of high temperature			
Horticulture				
Mango	Irrigation if available may be applied to combat the effect of high temperature			
Cold wave and Frost				
Wheat	Light frequent irrigation may be practiced wherever irrigation facilities are available			
Mustard	Light frequent irrigation may be practiced wherever irrigation facilities are available			
Horticulture				
Mango	Light frequent irrigation may be practiced wherever irrigation facilities are available, mulching, thatching and creating smoke screens and lighting of fire is also practiced where irrigation facilities are not available			
Litchi	Light frequent irrigation may be practiced wherever irrigation facilities are available, mulching, thatching and creating smoke screens and lighting of fire is also practiced where irrigation facilities are not available			
Cyclone	Not applicable			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

Livestock	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	Increasing area under fodder crops; collect crop residues, collect tree fodder, use mangers, use chaff cutters , hay, silage and complete feed block storage	Utilization of fodder from Perennial & reserve sources, open grazing in forests and alpine slopes/ community lands and feeding of crop residues ; use of mangers and chaff cutters , to feed household waste, use fodder from scarcity fodder trees	Availing Insurance, culling undesirable livestock ; raising of fodder trees, replacement of unproductive animals with improved ones
Health and disease management	Advance preparation with medicines and vaccination, local	Treatment of affected livestock by mass campaign, modern veterinary care, veterinary	Proper veterinary care, awareness, capacity building of locals, health care

	ethno pharmaceutical and modern medicines, vaccination of ground water sources. Procure and stock emergency medicines 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 Joint Director (Animal Husbandry) office in the district. Adequate refreshment training to be given to VOs, Vet Pharmacists with regard to health and management measures. Procure and stock multivitamins and area specific mineral mixture	camps, isolation. Carry out de-worming to all animals entering into relief camps. Identification and quarantine 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 under taken to prevent tick animals and their treatment. Organize with community, daily lifting of dung from relief camps.	management. 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 bredd their animals during July to September so that the peak milk production does not coincides with mid summer
Drinking water	Storage of water in tanks , traditional water ponds , rivers, provision of ground water sources	Utilization of stored water, stall drinking , rivers , traditional water ponds and ground water	Rejuvenation of water sources
Floods			
Feed and fodder availability	Increasing area under fodder crops. Harvesting prior to the event.	Evacuation to safer places	Plantation of fodder trees
Health and disease management	Advance preparation with medicines and vaccination	Ensuring timely vaccination and availability of veterinary staff, regular check of spread of diseases.	Availing Insurance, Culling undesirable Livestock, feeding good quality fodder.
Drinking water	Provision of ground water resources.	Judicious use of water for cleaning of sheds.	Rejuvenation of water resources.
Cyclone			
Cold wave			
Shelter/environment management	Stall feeding is the practice in the district. Restricted open grazing	Stationary conditions in cowsheds , group living, dry grass flooring, gunny bags on windows, gunny bags wrapped on the belly of	Open grazing, grazing in open sun , massage of milking animals and other species, hot water bath of animals

		milking animals , restricted open grazing during sunny days only	
Health and disease management	Traditional herbs fed to animals, Use of immune - modulators	Warm living conditions, syrup of lassi (curd juice) after roasting fed to animals, avoid exposure to cold and rains/ snow. Provision of fans/shade during warm waves and cold drinking water. Provision of warm housing during cold waves. Use of immune - modulators	Open grazing in sunny days and feeding of medicinal herbs. In case of acute problem, veterinary care In case of problem, consult veterinarians. Use of multivitamins and multi minerals. Use of immune - modulators

2.5.2 Poultry

Poultry	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Compounded feed procured from market.	Supply of feed from the adjoining areas through Departmental interventions	Promotion of feed resources
Health and disease management	Surveillance and management by Department of Animal Husbandry. Culling of sick birds, De-worming and vaccination against infectious and contagious diseases .	Surveillance and management by Department of Animal Husbandry. Mixing of Vit. A.D,E,K, and B-complex including vit.C in drinking water	Surveillance and management by Department of Animal Husbandry. Hygienic and sanitation of poultry house. Disposal of dead birds by burning/burying with lime powder in pit.
Drinking water	Not a major problem, though construction of small rain harvesting storage structures for contingent plans.	Supply of water through Departmental interventions	Construction of small rain harvesting storage structures for contingent plans.
Floods	Not applicable		
Cyclone	Not applicable		
Heat wave and cold wave			
Shelter/environment management	Adequate ventilation during night in summer and adequate protection from cold is exercised during winter		

2.5.3 Fisheries

Fisheries	Suggested contingency measures		
	Before the event[a]	During the event	After the event
Drought			
Shallow water in ponds due to insufficient rains/inflows	Water harvesting structures with rain water impounding from catchment areas	Impounding of water through departmental interventions to save fish germplasm	Water harvesting structures with rain water impounding from catchment areas; watershed development planning and implementations.
Floods	Not applicable		
Heat wave and cold wave	Not applicable		