

State: HIMACHAL PRADESH
Agriculture Contingency Plan for District: KULLU

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone	Western Himalayas, Warm Subhumid (To Humid With Inclusion Of Perhumid) Eco-Region (14.1)		
	Agro-Climatic Region (Planning Commission)	Western Himalayan Region (I)		
	Agro Climatic Zone (NARP)	Sub-Montane and Low Hills, Sub-Tropical Zone I. Valley Areas/ Low Hills: (35.50%) II. Mid Hill Mild Temperate areas: (44.23%) III. High Hills Temperate Areas: (16.50%) IV. High Hills Wet Temperate areas: (4.14%) High Hills Temperate Wet Zone (100%)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Southern part pf Chamba, Una (Hamirpur), Solan, Bilaspur, Nahan, Kullu (S.part), Dharmasala (S.part)		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		31°.52 To 31°.58 N	76° 13 To 76° 44 E	1230 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	CSKHPKV, Hill Agricultural Research & Extension Centre, Bajaura Dist. Kullu (HP) Phone 01905-287235 (O)		
	Mention the KVK located in the district with address	CSKHPKV, Krishi Vigyan Kendra, Bajaura (Kullu), Himachal Pradesh- 175 125 Phone 01905-287318 (O)		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Dr. YSPUH&F, Seobagh, Scientist Incharge, Horticultural Research Station, Dist. Kullu (HP)			

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

1.2	Rainfall (2006 to 2012)	Average (mm)	Normal onset	Normal cessation
	SW monsoon (June –Sept)	529	1 st week of July	2 nd week of September
	NE Monsoon (Oct–Dec)	63	3 rd week of November	
	Winter (Jan– Feb)	154		
	Summer (Mar–May)	172		
	Annual	918		

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)	550.3	36.3	-	6.1	-	2.9	0.4	1.1	3.4	-

Source: Statistical outline of Himachal Pradesh, 2008-09

1.4 Major soils

1.4	Major Soils	Area ('000 ha)	Percent (%) of total	Physiography	Elevation
	1. Rock out crops with shallow, sandy skeletal soils	27.9	5.06	Summits and Ridge tops	Greater Himalayas
	2. Rock out crops with shallow, loamy skeletal soils	0.8	0.14	Summits and Ridge tops	Greater Himalayas
	3. Rock out crops with medium deep, sandy skeletal soils	28.6	5.19	Mountains and valley glaciers	Greater Himalayas
	4. Rock out crops with medium deep, loamy skeletal soils	9.6	1.74	Side/ Reposed slopes	Greater Himalayas
	5. Rock out crops with shallow, loamy skeletal soils	9.2	1.67	Side/ Reposed slopes	Greater Himalayas
	6. Rock out crops with medium deep, loamy skeletal, calcareous soils	61.6	11.1	Side/ Reposed slopes	Greater Himalayas
	7. Rock out crops with deep, loamy skeletal soils	23.3	4.23	Side/ Reposed slopes	Greater Himalayas
	8. Rock out crops with medium deep, sandy skeletal over fragmental soils	9.8	1.7	Side/ Reposed slopes	Greater Himalayas
	9. Deep, loamy soils	3.1	0.56	Side/ Reposed slopes	Greater Himalayas
	10. Medium deep, sandy skeletal soils	7.3	1.32	Glacio-fluvial valley	Greater Himalayas
	11. Shallow to medium shallow, loamy soils	10.8	1.96	Summits and Ridge tops	Lesser Himalayas
	12. Rock out crops with deep, loamy skeletal soils	15.9	2.88	Side/ Reposed slopes	Lesser Himalayas
	13. Medium deep, sandy soils	0.2	0.036	Side/ Reposed slopes	Lesser Himalayas

14. Deep loamy skeletal soils	25.6	4.65	Side/ Reposed slopes	Lesser Himalayas
15. Shallow , loamy skeletal soils	150.8	27.4	Side/ Reposed slopes	Lesser Himalayas
16. Deep, loamy soils	9.4	1.7	Side/ Reposed slopes	Lesser Himalayas
17. medium deep, loamy calcareous soils	17.8	3.23	Side/ Reposed slopes	Lesser Himalayas
18. Shallow to medium deep loamy soils	60.6	11.0	Side/ Reposed slopes	Lesser Himalayas
19. Medium deep to deep, loamy soils	77.8	14.1	Side/ Reposed slopes	Lesser Himalayas
Total	550.1	100		

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	36.3	179 %
	Area sown more than once	28.7	
	Gross cropped area	65.0	

Source: Field survey 2007-08

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	2.8		
	Gross irrigated area	2.9		
	Rainfed area	33.6		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			
	Tanks	77	0.1	14.0
	Tube wells			
	Bore wells			
	Other wells			
	Lift irrigation schemes	13	0.4	36.5
	Micro-irrigation			
	Other sources :			
	Kuhls	32	0.5	49.4
	Khattris (Man-made water storage in rocky caves)			
Total Irrigated Area		1.07	100	
Pump sets				
No. of Tractors	1165	455		
Groundwater availability and use* (Data	No. of blocks	(%) area	Quality of water (specify the problem such as high	

	source: State/Central Ground water Department /Board)			levels of arsenic, fluoride, saline etc)
	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%				

1.7 Area under major field crops & horticulture

1.7	Major field crops cultivated	Area(000' ha)
		Total
	Wheat	21.8
	Maize	16.0
	Rice	1.6
	Barley	1.5
	Pulses	
	i) Rajmash	3.2
	ii) Blackgram	1.2
	iii) Other pulses	0.6
	Oil seeds	
	i) Mustard	0.4
	ii) Other oilseeds	0.8
Horticultural Crops		
	Apple	19.5
	Stone fruits	2.4
	Other fruits	1.8
Vegetables & Spices		
	Garlic & Onion	1.8
	Pea (Green)	1.3
	Cabbage	0.9
	Cauliflower	0.9
	Tomato	0.7
	Brinjal	0.4
	Radish	0.4
	Capsicum & Chillies	0.3
	Beans	0.3

	Okra	0.1
	Cucurbits	0.1
	Total	7.4

1.8 Livestock

1.8	Type of animals	Total Number ('000)
	Crossbred cows	69.2
	Local cows	85.4
	Total Cattle	154.6
	Bullocks	52.2
	Buffaloes	2.4
	Goats	150.4
	Sheep	200.9
	Young Stock	44.9
	Others (Unproductive)	14.9
Total Livestock		568.3
1.9		
	Poultry	45.2
	Broilers	102.0

1.10	Inland Fisheries			
		Water Spread Area (ha)	Yield (t/ha)	Production ('000 M tons)
	i) Brackish water			
	ii) Fresh water (only)	0.5	44	23.5
Total area estimated		0.5	44	23.5

1.11 Production and Productivity of major crops (Average of last 5 years: 2004-2009)

1.11	Name of crop	Kharif		Rabi		Summer		Total		
		Production ('000MT)	Productivity (kg/ha)	Production ('000MT)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000MT)	Productivity (kg/ha)	
	Cereals									
	Wheat			47.3	2170			47.3	2170	
	Maize	33.1	2062					33.1	2062	
	Barley			2.8	1821			2.8	1821	
	Pulses	4.4	870					4.4	870	

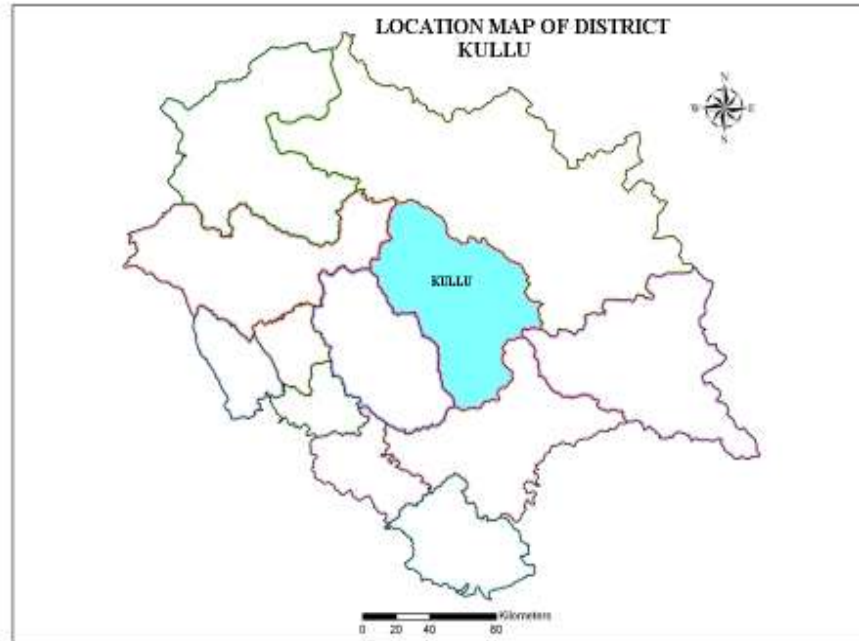
Vegetables & Spices	84.1	11313			84.1	9175
Fruits						
Apple	258.6	13236			258.6	13236
Stone Fruits	37.9	15746			37.9	15746
Other Fruits	17.3	9652			17.3	9652

Sowing window for 5 major field crops	Maize	Pulses	Wheat	Barley	Garlic/Peas
<i>Kharif</i> - Rainfed	2 nd week of April (High Hills only) 1 st week of July to 2 nd week of July	3 rd week of June to 3 rd week of July			
<i>Kharif</i> -Irrigated					
<i>Rabi</i> - Rainfed			1 st week of October - 4 th week of January	1 st week of October - 4 th week of January	
<i>Rabi</i> -Irrigated			1 st week of November to 4 th week of November	1 st week of November to 4 th week of November	

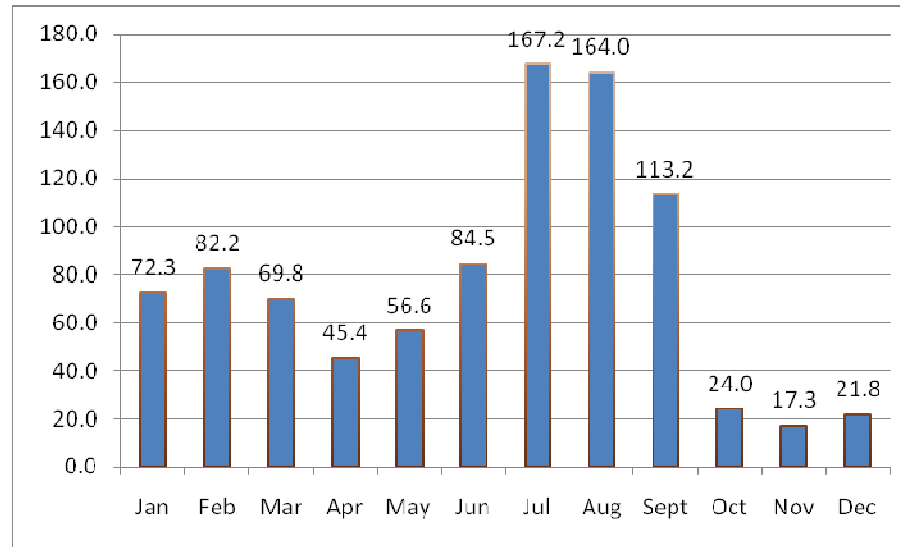
1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	√		
	Floods		√	
	Cyclone			√
	Hail storm	√		
	Heat wave			√
	Cold wave	√		
	Frost	√		
	Sea water intrusion			√
	Pests and disease outbreak	√		

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

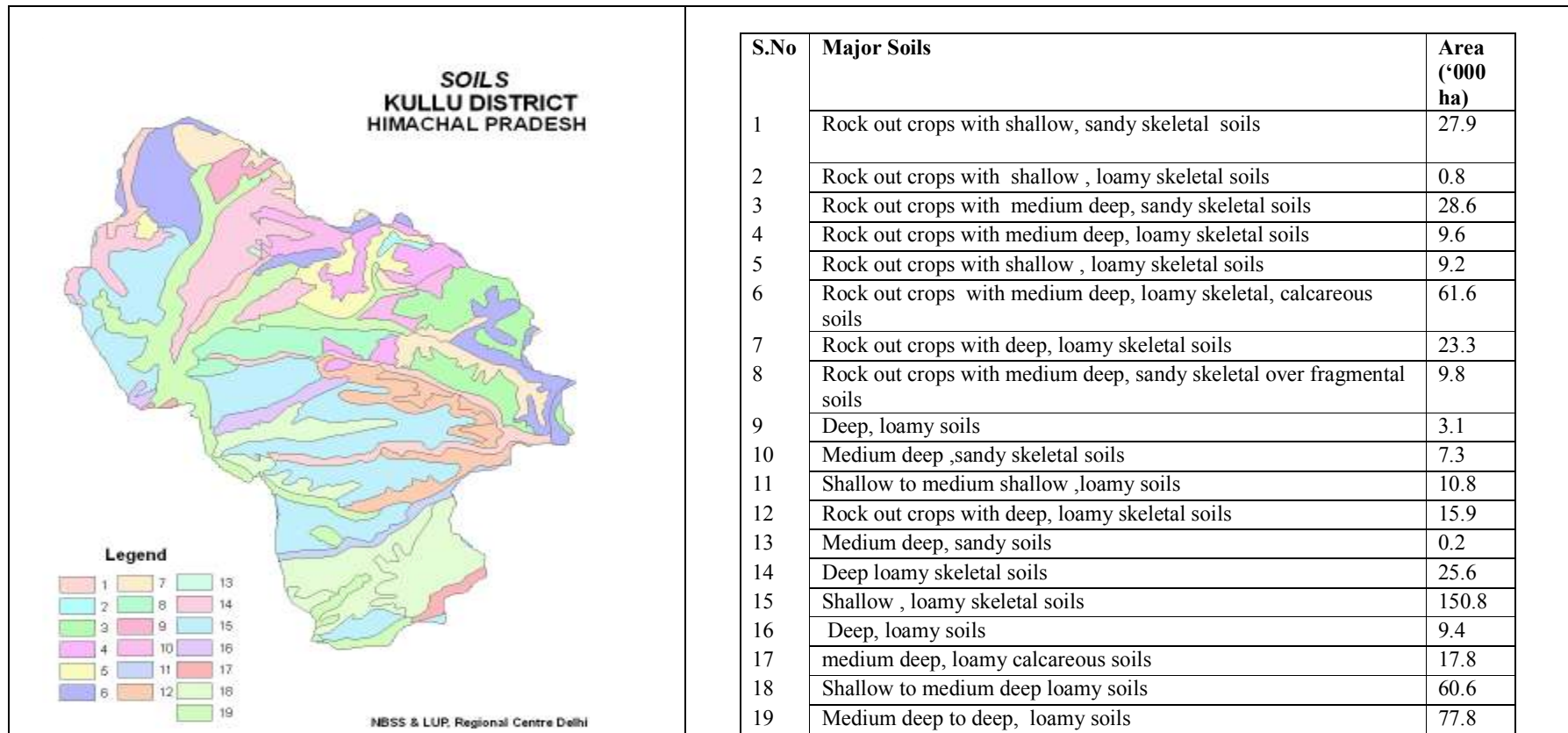
Annexure I



Annexure II



Annexure III Soil Map



2.0 Strategies for Weather related contingencies

2.1 Drought

2.1.1 Rain fed situation

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 3 rd week of July <i>Kharif</i> season	Shallow to deep loamy soils -Low and mid hills and valley areas with mild temperate climate	Maize, Maize +Pulses	Fodder: Maize/ Sorghum/ Bajra (up to 30 th Aug)/ African Tall/ composites. Babycorn (up to 15 th Aug): VL 78/ Early Composite Blackgram (up to 25 th July) : Kullu 4/ Palampur 93/ UG 218/ Pant U 19 Horse gram: HPK 4/ VLG 1 Soybean: Shivalik/ Palam Soya 1	<ul style="list-style-type: none"> ➤ Addition of organic manures (FYM/ ➤ compost) to the soil at least 5-10 t/ha. ➤ Soil moisture conservation measures with locally available mulches ➤ Plug/ Smear the field bunds to avoid water and nutrient leakage loss. ➤ Cultivation across the slope: All agricultural operations including ploughing and sowing should be done across the slope 	
	Shallow to deep loamy soils - High Hills, temperate climate	Maize, Maize +Pulses	Babycorn: VL 78/ Early composite Blackgram: Kullu 4/Palampur 93/ UG 218/ Pant-U- 19, Cowpea : Himachal Lobia 1 (C475) / C 519 Horsegram : HPK 4 / VLG 1 Rajmash: Kanchan/ Him 1/ Triloki/ Baspa		
Delay by 4 weeks 1 st week of August	Shallow to deep loamy soils -Low and mid hills and valley areas with mild temperate climate	Maize Maize +Pulses	Fodder: Maize/ Sorghum(up to 30 th Aug); African Tall/ composites / local varieties Babycorn (up to 15 th Aug):VL 78 Blackgram :- Kullu 4/ Palampur 93/ UG 218/ Pant U 19 Cowpea: : Himachal lobia 1(C475) / C 519 French bean: French Bean bush Type in rain Shadow belts (up to 1000-1500m) Pole Type in Valley areas (up to 1000m)		Seed supply through ISOPOM, RKVY
	Shallow to deep loamy soils - High Hills, temperate climate	Maize Maize +Pulses	Babycorn (up to 15 th Aug):VL 78 Blackgram :- Kullu 4/ Palampur 93/ UG 218/ Pant U 19 Cowpea: Himachal lobia 1 (C475) / C 519		

			French bean: French Bean bush Type in rain Shadow belts (up to 1000-1500m)		
Delay by 6 weeks 3 rd week of August	Shallow to deep loamy soils -Low and mid hills and valley areas with mild temperate climate	Maize +Pulses Maize	Fodder: maize/ Sorghum(up to 30 th Aug)/African Tall/ composites / local varieties Babycorn (up to 15 th Aug):VL 78, Blackgram :- Kullu 4/ Palampur 93/UG 218/ Pant U 19 French bean: French Bean bush Type in rain Shadow belts (up to 1000-1500m) Pole Type in Valley areas (up to 1000m) Green Manuring crops: Sunhemp , Dhaincha, cowpea, Soybean etc.	<ul style="list-style-type: none"> ➤ Addition of organic manures (FYM/ compost) to the soil at least 5-10 t/ha. ➤ -Soil moisture conservation measures with locally available mulch ➤ Vegetative barriers/bund risers: Grasses like Setaria, Sohal, Kanja, Baja, and Napier Bajra hybrid are suitable for making vegetative barriers. ➤ Plug/ Smear the field bunds to avoid water and nutrient leakage loss. ➤ Cultivation across the slope: All agricultural operations including ploughing and sowing should be done across the slope ➤ Add phosphate fertilizes to pulse crops @ 60kg /ha 	Seed supply through ISOPOM, RKVY
	Shallow to deep loamy soils - High Hills, temperate climate	Maize Maize +Pulses	Fodder maize (up to 30 th Aug); African Tall/ composites /local maize varieties Pea : Azad P-1/ Punjab 89/ Palam Priya etc.		
Delay by 8 weeks 1 st week of September	Shallow to deep loamy soils -Low and mid hills and valley areas with mild temperate climate	Maize	Peas : Arkel/Mattar Ageta/ Palam Triloki (ES upto 15 th Oct.) oats for fodder: Palampur-1/ Kent		Seed supply through ISOPOM, RKVY
Delay by 8 weeks 1 st week of September	Shallow to deep loamy soils - High Hills, temperate climate	Maize Maize +Pulses	Pea : Azad P-1/ Punjab 89/ Palam Priya Garlic : Agrifound Parvati / GHC 1 Fodder oats : Palampur-1/ Kent		

Rabi Season Delay by 2 weeks	Shallow to deep loamy soils -Low and mid hills and	Wheat	Wheat: V L 892/ HS 490/ HS 295/ Raj 3777,	1.Increase seed rate by 25% 2.Reduce the nitrogen fertilizer dose by 25%	
		Barley/oats	Fodder barley : HBL 276/ BHS 380/		

1 st week of December	valley areas with mild temperate climate		Dolma/ BHS 169/ BHS 352 Fodder oats: Palampur 1 / Kent	3.Close spacing 4.Addition of organic manures (FYM/compost) to the soil at least 5-10t/ ha. 5.Adopt soil moisture conservation measures with locally available mulch .
		Wheat+ Sarson	Wheat: Viz. V L 892/HS 490/ HS 295/ Raj 3777, Wheat+ brassica/ mustard (RCC4)/ Gobhi sarson (Neelam) Peas: Azad P 1/ Palam Priya/ Pb 89 etc.	
		Garlic	Peas: Azad P 1/ DPP 68/Pb 89 etc Gobhi sarson : Neelam Fodder barley : HBL 276/ BHS 380/ Dolma/ BHS 169/ BHS 352 Fodder oats: Palampur 1 / Kent	
		Peas	Peas: Azad P 1/ Pb 89 etc	
Delay by 2 weeks 1 st week of December	Shallow to deep loamy soils - High Hills, temperate climate	Wheat, Barley/oats, Garlic, Pea, Wheat+ Sarson	Peas: Azad P 1/ Palam Priya/PB 89 etc Fodder barley : HBL 276/ BHS 380/ Dolma/ BHS 169/ BHS 352/ local varieties. Fodder oats: Palampur 1 / Kent	1.Increase seed rate by 25% 2.Reduce the nitrogen fertilizer dose by 25% 3.Close spacing 4.Addition of organic manures (FYM/compost) to the soil at least 5-10t/ ha. 5.Soil moisture conservation measures viz. Mulching etc. 6.Inter cropping with pea may be done
Delay by 4 weeks 4 th week of December	Shallow to deep loamy soils -Low and mid hills and valley areas with mild temperate climate	Barley/oats	Wheat: V L 892/ HS 490/ HS 295/ Raj 3777, Peas: Azad P 1/ Palam Priya/ Pb 89 etc Fodder barley : HBL 276/ BHS 380/ Dolma/ BHS 169/ BHS 352 Fodder oats: Palampur 1 / Kent	
Delay by 4 weeks 4 th week of December	Shallow to deep loamy soils - High Hills, temperate climate	Wheat+ Sarson	Peas: Azad P 1/ Palam Priya/ Pb 89 etc. Fodder barley : HBL 276/ BHS 380/ Dolma/ BHS 169/ BHS 352 Fodder oats: Palampur 1 / Kent	
Delay by 6 weeks 2 nd week of January	Shallow to deep loamy soils -Low and mid hills and valley areas with mild temperate climate	Wheat, Barley/oats, Garlic, Pea, Wheat+ Sarson	Wheat: V L 892/ HS 490/ HS 295/ Raj 3777 Fodder barley : HBL 276/ BHS 380/ Dolma/ BHS 169/ BHS 352 Fodder oats: Palampur 1 / Kent Sarson : Gobhi sarson	
Delay by 6 weeks 2 nd week of January	High Hills Temperate Areas, Snow fall is there, so nothing can be sown			

Delay by 8 weeks 4 th week of January	Shallow to deep loamy soils -Low and mid hills and valley areas with mild temperate climate	Wheat, Barley/oats, Garlic, Pea, Wheat+ Sarson	Fodder barley : HBL 276/ BHS 380/Dolma/ BHS 169/ BHS 352 Fodder oats : Palampur 1 / Kent Sarson : Gobhi sarson	.Increase seed rate by 50% 2.Reduce the nitrogen fertilizer dose by 25% 3.Close spacing 4.Addition of organic manures (FYM/compost) to the soil at least 5-10t/ha. 5.Soil moisture conservation measures viz. Mulching etc. 6.Inter cropping with pea may be done	Seed supply through ISOPOM, RKVY
Delay by 8 weeks 4 th week of January	High Hills Temperate Areas , Snow fall is there, so no activity can be done				

Condition	Suggested Contingency measures				
	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Not Applicable				
At vegetative stage	Not Applicable				
At flowering/ fruiting stage	Not Applicable				
Terminal drought (Early withdrawal of monsoon)	Not Applicable				

2.1.2 Drought - Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall		Cauliflower-Cauliflower-Pea	Short duration crops : French bean, cabbage may be sown	<ul style="list-style-type: none"> • Add 20-25 t/ha of FYM/Compost to the soil • Split application of Nitrogen doses • Avoid top dressing during water scarcity period 	
		Tomato-cauliflower-Pea	Short duration crops French bean (bush Type) French bean : Palam Mridula, Contender etc.		

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
		French bean-Tomato-Cauliflower	French bean-Tomato- Cauliflower	<ul style="list-style-type: none"> • Intercropping with legumes • Add locally available organic material as mulch • Dust mulching may be done by just scrubbing the top soil. 	

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Limited release of water in canals due to low rainfall	Not Applicable				
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 Rain fed and irrigated situations)

Condition	Suggested contingency measures			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Maize	<ul style="list-style-type: none"> • Drain out the excess water as early as possible • Take up inter culture operations and at optimum soil moisture condition to loosen and aerate the soil and to control weeds. • Apply a supplement dose of nitrogen and potash if required after draining excess water . 	<ul style="list-style-type: none"> • Drain out the excess water with proper drainage 	<ul style="list-style-type: none"> • Drain out the excess water with proper drainage • Cobs harvesting from standing crop if physiologically mature 	<ul style="list-style-type: none"> • Dry the produce well and maintain 10-12% of moisture before storage

Pulses (Blackgram and Rajmash)	<ul style="list-style-type: none"> • Drain out the excess water as early as possible 	<ul style="list-style-type: none"> • Drain out the excess water as early as possible 	<ul style="list-style-type: none"> • Drain out the excess water as early as possible 	Dry the produce well and maintain 10-12% of moisture before storage
Wheat	<ul style="list-style-type: none"> • Drain out the excess water as early as possible 	<ul style="list-style-type: none"> • Complete drainage of water • Control of rust with Propiconazol @0.1% spray in the last week of Feb. or First week of March. 	<ul style="list-style-type: none"> • Complete drainage of water as soon as possible 	<ul style="list-style-type: none"> • After the harvest complete drying process has to be taken ensure that the fungus development has not taken on the seeds • If rains are continuing take to safe storage place and before storage ensure that the moisture is 12%
Barley	<ul style="list-style-type: none"> • Drain out the excess water as early as possible • Additional dose of nitrogen if nitrogen deficiency occurs (yellowing) 	<ul style="list-style-type: none"> • Complete drainage of water • Control of rust with Propiconazol @ 0.1% spray in the last week of Feb. or First week of March. 	<ul style="list-style-type: none"> • Complete drainage of water as soon as possible 	<ul style="list-style-type: none"> • After the harvest complete drying process has to be taken ensure that the fungus development has not taken on the seeds • If rains are continuing take to safe storage place and before storage ensure that the moisture is 12%)
Heavy rainfall with high speed winds in a short span				
Maize	<ul style="list-style-type: none"> • To drain out the excess water at the earliest. • Intercultural operation and earthing up to be done. • Apply nitrogen and potash after draining excess water, if required. • Take up plant protection measures against possible insect-pests and disease incidence. 	<ul style="list-style-type: none"> • Drain out the excess water at the earliest • Intercultural operation and earthing up to be done • Take up plant protection measures against possible pests and disease incidence 	<ul style="list-style-type: none"> • Drain out the excess water at the earliest • Take up plant protection measures against possible pests and disease incidence 	<ul style="list-style-type: none"> • Drain out the excess water at the earliest • Dry the produce well to maintain 10-12% of moisture before storage
Wheat	<ul style="list-style-type: none"> • Surface drainage to drain out excess water • Intercultural operations after draining excess water to improve aeration of the soil and to control the weeds • Apply additional fertilizer dose to regain lost vigor 	<ul style="list-style-type: none"> • Surface drainage to drain out excess water • Intercultural operations after draining excess water to improve aeration of the soil and to control the weeds 	<ul style="list-style-type: none"> • Surface drainage to drain out excess water • Apply additional fertilizer dose to regain lost vigor • Harvest the produce on clear sunny day 	<ul style="list-style-type: none"> • To cover produce with plastic sheet or shift produces to farm shed /a safer place. • Ensure proper drying of grain (10-12% of moisture) before storage.

Barley	<ul style="list-style-type: none"> • Surface drainage to drain out excess water • Intercultural operations after draining excess water to improve aeration of the soil and to control the weeds • Apply additional fertilizer dose to regain lost vigor • 	<ul style="list-style-type: none"> • Surface drainage to drain out excess water • Intercultural operations after draining excess water to improve aeration of the soil and to control the weeds • Apply additional fertilizer dose to regain lost vigor 	<ul style="list-style-type: none"> • Surface drainage to drain out excess water • Apply supplemental dose to regain lost vigor • Harvest the produce on clear sunny day 	<ul style="list-style-type: none"> • To cover produce with plastic sheet or shift produces to farm shed /a safer place. • Ensure proper drying of grain (10-12% of moisture) before storage.
Pulses (Rajmash/Black Gram)	<ol style="list-style-type: none"> 1. Drain out the excess water as early as possible 2. Spray water soluble fertilizers at 1% to support nutrition 3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% 4. Take up timely control measures against the out break of insect-pests and diseases 	<ol style="list-style-type: none"> 1. Drain out the excess water as early as possible 2. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% against blight and wilt 4. Take up timely control measures against the out break of insect-pests and diseases 	1. Drain out the excess water as early as possible	Complete drainage,
Outbreak of pests and diseases due to unseasonal rains				

2.3 Floods

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

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

Extreme event type	Suggested contingency measure ^f			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	Not Applicable			
Cold wave				
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			
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			
Hailstorm				
Maize				
wheat				
Pulses & Oilseeds				
Potato & Other vegetables				

2.4 Contingent strategies for Livestock, Poultry & Fisheries

2.4.1 Livestock

Condition	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	<ul style="list-style-type: none"> ➤ Increase area under fodder crops; Collect and store crop residues, collect tree fodder, ➤ Mineral mixture and concentrated feed ➤ Fodder banks at village level 	<ul style="list-style-type: none"> ➤ Utilization of fodder from Perennial & reserve sources, Open grazing in forests and grasslands / community lands and feeding of crop residues. ➤ feeding of household waste, 	<ul style="list-style-type: none"> ➤ Availing Insurance ➤ Culling undesirable Livestock ➤ replacement of unproductive animals with improved ones

	<ul style="list-style-type: none"> ➤ Straw based densified feed blocks as total mixed ration blocks/ Complete Feed Block Technology ➤ Nutritional enrichment of straw and other poor forages by urea treatment ➤ Mineral licks ➤ Multi species Livestock farming: along with cattle, goat & sheep farming should be promoted as these species are relatively mildly affected by drought and depend on common property resources. ➤ Introduction of improved perennial grasses on bunds, fallow lands and grasslands to meet out the fodder scarcity, 	<ul style="list-style-type: none"> ➤ Storage of fodder as silage and hay ➤ Prepare complete feed blocks for feeding during scarcity period ➤ Govt must provide subsidized feed and mineral mixture during the period ➤ Small ruminants like sheep and goats can be sold for slaughter in worst situations as there is round the year market for them ➤ Use of fodder from scarcity fodder trees 	<ul style="list-style-type: none"> ➤ Keeping a lesson from the present situation, procure the seed of fodder crops from the reliable sources, Plant more & more quality fodder trees in the surroundings. ➤ Introduction of improved perennial grasses on bunds, fallow lands and grasslands to meet out the fodder scarcity, ➤ Fertilize the local grasslands with 60kg Nitrogen and 40kg phosphorus per hectare after the drought is over.
Drinking water	<ul style="list-style-type: none"> ➤ Storage of water in tanks , Traditional water ponds , rivers ➤ Provision of ground water harvesting 	<ul style="list-style-type: none"> ➤ Utilization of stored water, Stall drinking , rivers , traditional water ponds ➤ Provision of ground water harvesting 	<ul style="list-style-type: none"> ➤ Rejuvenation of water sources and local water bodies and ground water ➤ Emphasize rainwater harvesting and store it properly for animal drinking.
Health and disease management	<ul style="list-style-type: none"> ➤ Advance procurement of medicines and vaccines, ➤ Advance training to veterinary field staff 	<ul style="list-style-type: none"> ➤ Treatment of affected livestock by mass campaign and vaccination ➤ Isolation, create smoke during nights in the cattlesheds to protect animals from mosquito and flea bites ➤ Proper disposal of dead animals 	<ul style="list-style-type: none"> ➤ Proper veterinary care to improve the health of survived animals
Floods	Not applicable		
Cyclone	Not applicable		
Cold wave/snow fall			
Shelter/environment management	<ul style="list-style-type: none"> ➤ Bring animals back from high hill pasture lands to nearby pastures ; restricted open grazing , ➤ Migrate small ruminants to plain areas ➤ Construct shelters to the animals 	<ul style="list-style-type: none"> ➤ 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, adequate shelter. ➤ Prevent water-logging conditions in animal houses. ➤ In <i>Kachha</i> houses, the floor should be elevated with bricks , Feed straw + Oats, Barley, White 	<ul style="list-style-type: none"> ➤ Open grazing, grazing in open sun , massage of milking animals and other species, hot water bath of animals

		<p>Clover, Red Clover, Lucerne fodder to milch animals with concentrates and protect the young ones from cold.</p> <p>➤ More care of pregnant animals, more animals can be housed together.</p>	
Health and disease management	➤ Advance provision of suitable close shelters for animals and vaccination,	<p>➤ Warm living conditions,</p> <p>➤ Boiled Pumpkin may be fed to animals,</p> <p>➤ Avoid exposure to cold and rains/ snow.</p> <p>➤ The prophylactic and preventive measures for the control of diseases should be adopted on the advice of veterinarian for <i>endo</i> and <i>ecto</i> parasites.</p>	<p>➤ Open grazing in sunny days and feeding of medicinal herbs</p> <p>➤ In case of acute problem , veterinary care</p>

2.4.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drought	Not Applicable			
Floods				
Cyclone				
Heat wave and cold wave				

2.4.3 Fisheries

	Suggested contingency measures		
	Before the event	During the event	After the event
1.Drought	Not Applicable		
2. Floods			
3. Cyclone / Tsunami			
4. Heat wave/cold wave			