

**State: Uttarakhand**  
**Agriculture Contingency Plan for District: Pithoragarh**

<b>1.0</b>	<b>District Agriculture profile</b>									
<b>1.1</b>	Agro-Climatic/Ecological Zone									
	Agro-Ecological Sub Region (ICAR)		14.2 : Western Himalaya warm sub humid(to humid with inclusion of per humid)							
	Agro-Climatic Region (Planning Commission)		Agro-Climatic Region 1: Western Himalayan Region							
	Agro-Climatic Zone (NARP)		AZ-26 hill zone							
	List all the district falling under the NARP Zone		U.S.Nagar, Haridwar, Nainital, Almora, Bageshwar, Champawat, Pithoragarh, Pauri, Tehari, Uttarkashi, Dehradun, Chamoli, Rudraprayag							
	Geographic coordinates of district		Latitude		Longitude		Altitude			
			29.7 <sup>0</sup> N		80.2 <sup>0</sup> E		1650m			
	Name and address of the concerned ZRS/ZARS/RARS/RRS/ RRTTS		Dr A K Singh, Zonal Project Director, GT Road, Rawatpur, Near Vikas Bhawan, Kanpur 0512-2550927(O)							
	Mention the KVK located in the district		Dr. Jitendra Kwatra, Krishi Vigyan Kendra, Gaina Aincholi, Distt.-Pithouragarh-262501, Phone No: 09760226518, 05964-252175email: kvkpithoragarh@yahoo.com							
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone		Dr H S Kushwaha, Professor, Agro meteorology, GBPUA&T, Pantnagar-263145 U S Nagar (UK) India							
Mentions the KVK located in the district		KVK, Gaina-Aincholi, Pithoragarh								
<b>1.2</b>	Rainfall	1200mm	Average (mm) Approximately	Normal Onset (specify week and month)		Normal cessation (specify week and month)				
	SW monsoon (June-Sep):		1490.4	1 <sup>st</sup> week of July		4 <sup>th</sup> week September				
	NE Monsoon (Oct.-Dec.):		95.6							
	Winter (Jan-March)		172.4							
	Summer (Apr-May)		123.1							
	Annual		1881.5							
<a href="http://www.pithoragarh.nic.in/files/others/Total_Table.pdf">http://www.pithoragarh.nic.in/files/others/Total_Table.pdf</a>										
<b>1.3</b>	Land use pattern of the district (latest statistics)	Geographical area	Forest area	Land under non-agriculture use	Permanent pastures	Cultivated wasteland	Land under Misc. tree crops and groves	Barren and uncultivated land	Current fallows	Other fallows
	Area (000 ha)	716.9	20.5	-	53.0	40.7	-	30.8	3.8	4.0

[http://www.pithoragarh.nic.in/files/others/Total\\_Table.pdf](http://www.pithoragarh.nic.in/files/others/Total_Table.pdf)

1.4	Major Soils	Area ('000ha)	Percent (%) of total	
	1 Alluvial sandy loam (Annexure-IV)			
	2			
	3			
	4			
	5			
	Other (specify)			
1.5	Agricultural land use	Area ('000ha)	Cropping intensity %	
	Net sown area	45.9	174.3	
	Area sown more than once	34.0		
	Gross cropped area	79.9		
	Lift irrigation	-		
1.6	<b>Irrigation</b>			
	Net cultivated Area	45.9		
	Net Irrigated Area	7.7		
	Micro Irrigation	(0.072ha) Drip Irrigation System		

[http://www.pithoragarh.nic.in/files/others/Total\\_Table.pdf](http://www.pithoragarh.nic.in/files/others/Total_Table.pdf)

1.7	<b>Area Under major field crops &amp; horticulture etc.</b>						
	<b>Major field crops</b>	<b>(‘000ha)</b>					
		<b>Kharif</b>		<b>Rabi</b>		<b>Total</b>	
		<b>Irrigated</b>	<b>Rainfed</b>	<b>Irrigated</b>	<b>Rainfed</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Wheat				28.2		28.2
	Rice		24.5				24.5
	Ragi		9.7				9.7
	Maize		4.7				4.7
	Barley				4.1		4.1
	Jhangora		0.2				0.2
	<b>Horticulture crops-Fruits</b>	<b>Total area</b>		<b>Irrigated</b>		<b>Rainfed</b>	
	Apple	1.6					
	Pear	1.2					
	Plum	0.9					
	Walnut	1.9					
	Peach	1.0					
	Apricot	0.8					
	Citrus	3.3					
	Mango	2.8					
Litchi	0.5						

Others	1.5		
<b>Total</b>	15.0		
<b>Total fodder crop area</b>			
<b>Grazing area</b>			
<b>Sericulture etc</b>			
<b>Other (Specify)</b>			
<b>Horticulture crops-Vegetable</b>	Total area	Irrigated	Rainfed
Potato	1605		
Pea	400		
Radish	628		
French Bean	526		
Cabbage	328		
Okra	256		
<b>Medicinal &amp; Aromatic crops</b>	Total area	Irrigated	Rainfed
Onion	405		
Tomato	398		
Brinjal	39		
Capsicum	342		
Cauliflower	76		

\*If break-up data (irrigated, rainfed) is not available, give total area.

1.8	Livestock	Number ('000)		
	Cattle	151300		
	Buffaloes total	86877		
	Commercial dairy farms			
	Goat	145173		
	Sheep	32804		
	Others (Camel, Pig, Yak etc.)	2382		
1.9	Poultry	50478		
	Commercial			
	Backyard			
1.10	Inland Fisheries			
		<b>Area (ha)</b>	<b>Yield (t/ha)</b>	<b>Production (tones)</b>
	Brackish water			
	Fresh water			
	Others			

[http://www.pithoragarh.nic.in/files/others/Total\\_Table.pdf](http://www.pithoragarh.nic.in/files/others/Total_Table.pdf)

1.11	Production & Productivity of major crops (Average of last 3 years: 2006, 07,08)	Kharif		Rabi		Summer		Total	
		Production ('000t)	Productivity (kg/ha)	Production ('000t)	Productivity (kg/ha)	Production ('000t)	Productivity (kg/ha)	Production ('000t)	Productivity (kg/ha)

	Rice	32144	1312						
	Wheat			40891	1451				
	Soyabean		700						
	Ragi	1460	1505						
	Maize	6110	1300						
	<b>Major Horticulture crops</b>								
	Potato	45.3	25520						
	Apple	3.0							
	Pear	12.53							
	Plum	1.5							
	Walnut	0.6							
	Peach	3.2							
	Apricot	1.1							
	Citrus	18.5							
	Mango	2.8							
	Litchi	0.5							
	Others	2.2							
	Veg. Pea	5.29							
	French Bean	6.47							
	Capsicum	3.86							
	Onion	5.03							
	Tomato	5.59							
1.12	Sowing window for 5 major crops (start and end of sowing period)	Rice	Wheat	Ragi	Maize	Soybean			
	Kharif-Rainfed	April-June	October.-November	May-June	May-July	May-June			
	Kharif-Irrigated	May-June	October.-November	-	-	-			
	Rabi- Rainfed	-	-	-	-	-			
	Rabi- Irrigated	-	-	-	-	-			

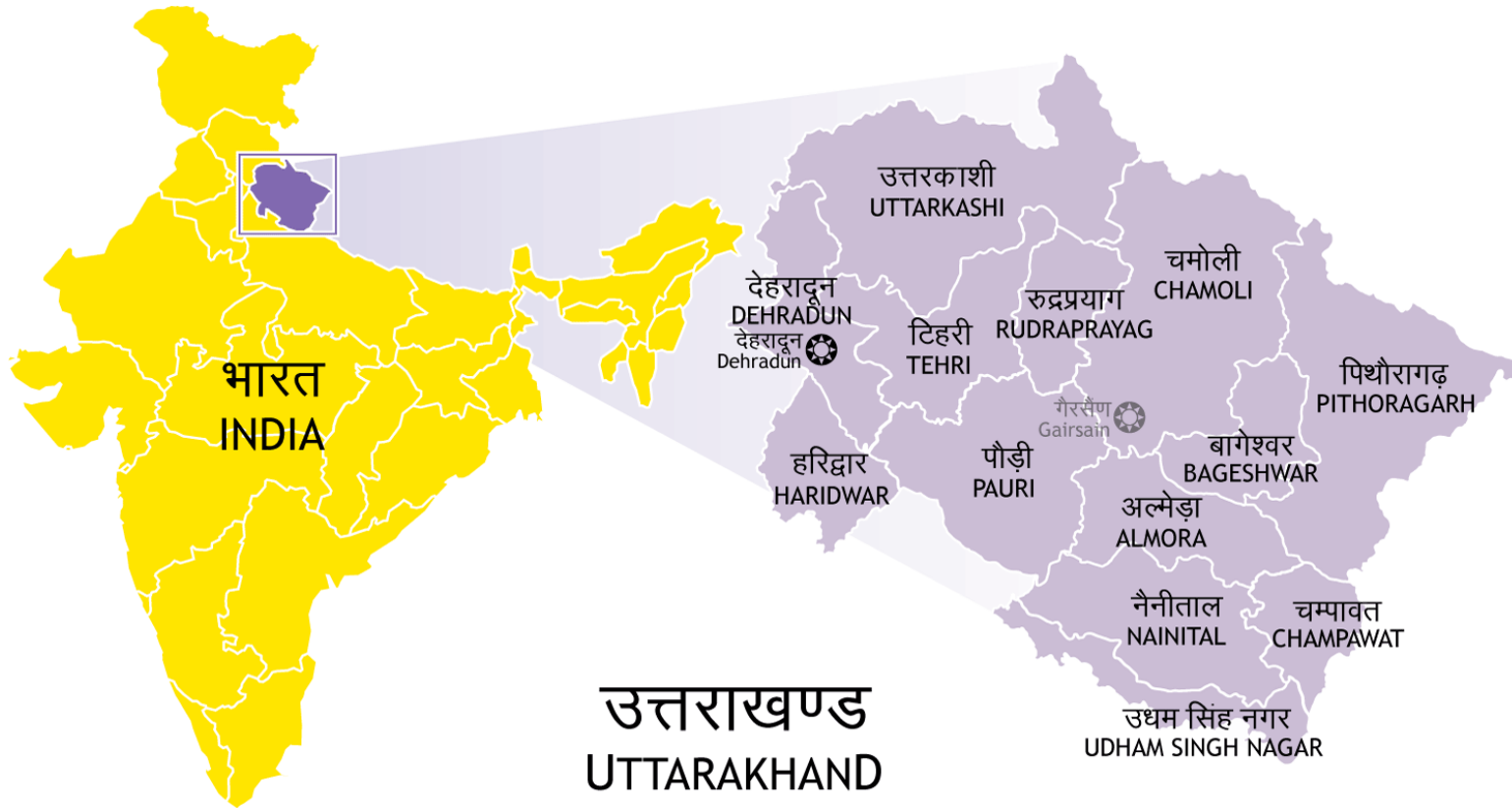
[http://www.pithoragarh.nic.in/files/others/Total\\_Table.pdf](http://www.pithoragarh.nic.in/files/others/Total_Table.pdf)

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular			Sporadic (specify month of occurrence in brackets)			None
		Severe	Moderate	Mild	Severe	Moderate	Mild	
	Drought		✓			December-February		
	Flood	-	-	-	-	-	-	-
	Cyclone							-
	Hail storm				April-June	April-June		
	Heat wave							
	Cold wave		✓			December-February		
	Frost	✓			December-February	December-February		

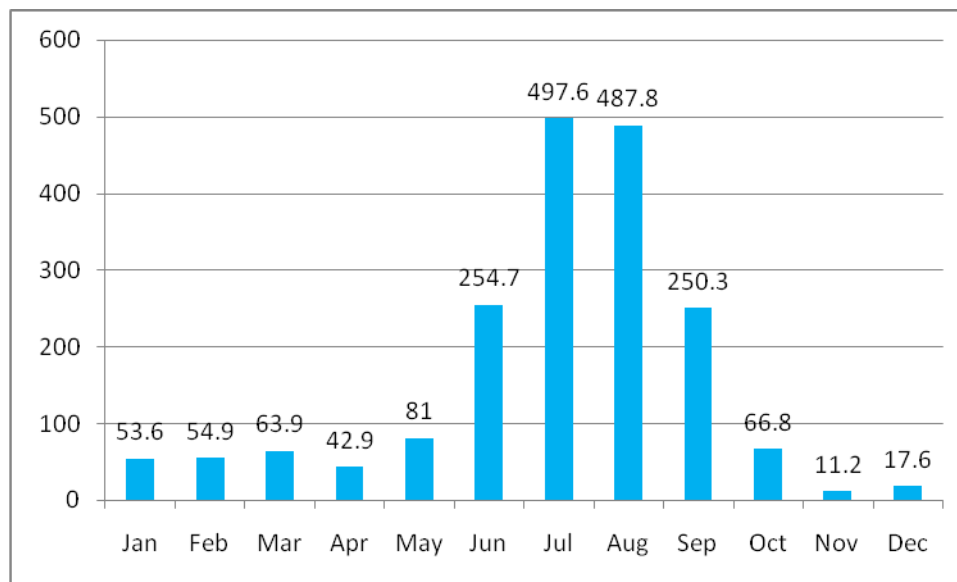
	Sea water inundation	-	-	-	-	-	-	-
	Pests and diseases (specify)	White grub, brown spot in Rice, Citrus Die back						

<b>1.14</b>	<b>Include Digital maps of the district for</b>	<b>Location map of district with in State as Annexure-1</b>	Enclosed: Yes
		Mean annual rainfall as Annexure-2	Enclosed: yes
		Soil map as Annexure-3	Enclosed: No

**Annexure 01: Location map of the Uttarakhand state and district Pithoragarh**



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



**2.0 Strategies for weather related contingencies**

**2.1 Drought**

**2.1.1 Rainfed situation: KHARIF**

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in Crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on implementation <sup>e</sup>
Delay by 2 weeks (June 3 <sup>rd</sup> wk)	Rain fed lower hills Upland soils	Rice-wheat	None	Maintenance of plant population by gap filling Weed management	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Soybean-mustard	Ragi	Short duration Ragi varieties ((VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2) Weed management Maintenance of plant population by gap filling Balanced fertilizer application	
	Rain fed Mid hills Upland soils	Rice-wheat	None	Maintenance of plant population by gap filling Weed management	
		Finger Millet – Lentil	None	Short duration Ragi varieties Weed management Maintenance of plant population by gap filling Balanced fertilizer application	
		Maize-Lentil	None	Short duration maize varieties Maintenance of plant population by gap filling Weed management	
		Horsegram-wheat	None	Maintenance of plant population by gap filling	
	Rain fed high hills	Ramdana-Fallow	None	Maintenance of plant population by gap filling Weed management	
		Rajma-lentil	None	Maintenance of plant population by gap filling Weed management Mulching by crop residues, forest leaves Balanced fertilizer application	
		Buckwheat-Lentil	None	Maintenance of plant population by gap filling Weed management	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in Crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on implementation <sup>e</sup>



Delay by 4 weeks (July 1st week)	Rain fed lower hills	Rice-wheat	Rice replaced by Urd (U-31, 35), Sesamum	Weed Management, Foliar application of fertilizers, Bunding of terraces, Increased seed rate, Mulching, Sowing across the slope, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Soybean- Mustard	Soybean replaced by Urd (U-31, 35), Sesamum, Veg Pea	Weed management	
	Rain fed Mid hills	Rice-wheat	Rice replaced by Sesumum & Horsegram (VLG1, VLG 8, VLG 10) Change of crop Cowpea Finger millet –VLM 146, Barnyard millet (VL Madira-172)	Weed Management, Foliar application of fertilizers, Use short duration varieties, Addition of organic manures, (FYM/compost) @ 5-10 t/ha, treated with Trichoderma, Sowing may be delayed till appropriate soil moisture condition reaches	
		Finger Millet-Lentil	None	Transplanting of ragi in standing fields, Weed Management, Foliar application of fertilizers	
		Maize-Lentil	None	Foliar application of fertilizers	
		Horse gram-Wheat	none	Weed Management	
	Rain fed high hills	Ramdana-wheat	None	Weed Management	
		Rajma-Lentil	None	Mulching Weed Management	
		Buckwheat-lentil	None	Weed Management	

Condition	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Suggested Contingency measures		Remarks on implementation <sup>e</sup>
			Change in Crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	
Early season drought (delayed onset)	Rain fed lower hills	Rice-wheat	Rice replaced by Urd (U-31, 35), Sesumum	Sowing after minimum tillage Weed management	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Soybean-wheat	Black Soybean+ Barnyard millet (VL 29, VL 21, VL Madira 172, PRJ 1)-Wheat	Sowing after minimum tillage Weed management	
	Rain fed Mid hills	Rice-wheat	Change of crop Finger millet –VLM 146, Barnyard millet (VL Madira-172)	Sowing after minimum tillage Weed management	
		Finger Millet-lentil	None	Transplanting of Ragi Weed management Foliar application of fertilizer	
		Maize-Lentil	Change of crop	Use crop as fodder	

			Finger millet –VLM 146, Barnyard millet (VL Madira-172)	Transplanting of Ragi	
		Horsegram-Wheat	None	Weed management	
		Ramdana-Wheat	Change of crop Finger millet –VLM 146, Barnyard millet (VL Madira-172)	Weed management Foliar application of fertilizer	
		Rajma- lentil	None	Weed management Foliar application of fertilizer	
		Buckwheat- Lentil	None	Weed management Foliar application of fertilizer	

Condition	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Suggested Contingency measures			
			Change in Crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on implementation <sup>e</sup>	
Delay by 8 weeks (1st week of August)	Rain fed lower hills	Rice-wheat	Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Minimum Tillage to conserve moisture Foliar application of fertilizer	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK	
		Soybean-Mustard	Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Minimum Tillage to conserve moisture, Foliar application of fertilizer		
	Rain fed Mid hills	Rice-wheat	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Use existing crop as fodder		
		Finger Millet-Lentil	Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green)	Use existing crop as fodder		
		Maize-Lentil	Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green), French bean (VL bauni Bean 1), radish (Pusa Chetki, Pusa Himani),	Use existing crop as fodder		
		Horsegram-wheat	Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green), French bean (VL bauni Bean 1), Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Use existing crop as green manure		
	Rain fed high hills					
		Ramdana-wheat	Early sowing of Mustard, Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur	Use existing crop as fodder		

			Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1) Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	
		Rajma-Lentil	Early sowing of Mustard, Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1), Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Use existing crop as fodder
		Buckwheat-Lentil	Early sowing of Mustard, Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1), Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Use existing crop as fodder

**\*Matrix for specifying condition of early season drought due to delayed onset of monsoon (2, 4, 6 & 8 weeks) compared to normal onset (2.1.1)**

Normal onset (Month and week)	Month and week for specifying condition of early season drought due to delayed onset of monsoon			
	Delay in onset of monsoon by			
	2 wks	4 wks	6 wks	8 wks
June 1 <sup>st</sup> wk	June 3 <sup>st</sup> wk	July 1 <sup>st</sup> wk	July 3 <sup>st</sup> wk	Aug 1 <sup>st</sup> wk
June 2 <sup>st</sup> wk	June 4 <sup>st</sup> wk	July 2 <sup>st</sup> wk	July 4 <sup>st</sup> wk	Aug 2 <sup>st</sup> wk
June 3 <sup>st</sup> wk	July 1 <sup>st</sup> wk	July 3 <sup>st</sup> wk	Aug 1 <sup>st</sup> wk	Aug 3 <sup>st</sup> wk
June 4 <sup>st</sup> wk	July 2 <sup>st</sup> wk	July 4 <sup>st</sup> wk	Aug 2 <sup>st</sup> wk	Aug 4 <sup>st</sup> wk
July 1 <sup>st</sup> wk	July 3 <sup>st</sup> wk	Aug 1 <sup>st</sup> wk	Aug 3 <sup>st</sup> wk	Sep 1 <sup>st</sup> wk
July 2 <sup>st</sup> wk	July 4 <sup>st</sup> wk	Aug 2 <sup>st</sup> wk	Aug 4 <sup>st</sup> wk	Sep 2 <sup>st</sup> wk

Condition	Suggested Contingency measures				
Early season drought (delayed onset)	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Soil nutrient & moisture conservation measures <sup>d</sup>	Remarks on implementation

Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5mm) perion)	Rain fed lower hills	Paddy-wheat	Thinning of crop Mulching if mulch material is available. Disease and insect management	Urea Top dressing after rains Foliar application of fertilizers Weed management	Linking agricultural operations to MANREGA, Seed given under IWMP & RKVY, Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
	Rain fed Mid hills	Paddy-wheat	Thinning of crop Mulching if mulch material is available, Disease and insect management	Urea Top dressing after rains, Foliar application of fertilizers, Weed management	
		Finger millet-lentil	Thinning of crop Mulching if mulch material is available. Disease and insect management	Urea Top dressing after rains Foliar application of fertilizers Weed management	
		Maize-wheat	Thinning of crop Mulching if mulch material is available. Disease and insect management	Urea Top dressing after rains Foliar application of fertilizers Weed management	
		Horsegram-wheat	Thinning of crop Mulching if mulch material is available. Disease and insect management	Urea Top dressing after rains Foliar application of fertilizers Weed management	
	Rain fed high hills	Ramdana-wheat	Thinning of crop Mulching if mulch material is available. Disease and insect management Thinning of crop	Urea Top dressing after rains Foliar application of fertilizers Weed management	
		Rajma-Lentil	Thinning of crop Mulching if mulch material is available. Disease and insect management	Urea Top dressing after rains Foliar application of fertilizers Weed management	
		Buckwheat-lentil	Thinning of crop Mulching if mulch material is available. Disease and insect management	Urea Top dressing after rains Foliar application of fertilizers Weed management	

Condition			Suggested Contingency measures		
Mid season drought (Long dry spell)	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Soil nutrient & moisture conservation measures <sup>d</sup>	Remarks on implementation <sup>e</sup>
At reproductive	Rain fed lower hills	Paddy-wheat	Thinning of plants	Foliar 2% urea spray	Linking agricultural operations to MANREGA, Inputs and spray equipments given under IWMP & RKVY, Dept. of Agriculture
	Rain fed Mid hills	Paddy-wheat	Thinning of plants	Foliar 2% urea spray	
		Fingermillet-lentil	Thinning of plants	Foliar 2% urea spray	
		Maize-lentil	Thinning of plants	Foliar 2% urea spray	

	Rain fed high hills	Horsegram-wheat	Thinning of plants	Foliar 2% urea spray	and KVK
		Ramdana-wheat	Thinning of plants	Foliar 2% urea spray	
		Rajma-lentil	Thinning of plants	Foliar 2% urea spray	
		Buckwheat- lentil	Thinning of plants	Foliar 2% urea spray	

Condition	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
			Crop management <sup>c</sup>	Rabi Crop planning <sup>d</sup>	Remarks on implementation <sup>e</sup>
Terminal drought	Rain fed lower hills	Paddy-wheat	Harvest crop for fodder purpose	Go for early sowing to use residual moisture Go for early crop varieties of Mustard, Lentil, barley, cabbage, radish, garlic, fenugreek,	Seed given under IWMP & RKVY, Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Soybean-Mustard	Use crop as green manure/fodder		
	Rain fed Mid hills	Paddy-wheat	Harvest crop for fodder purpose		
		Ragi-lentil	Harvest crop for fodder purpose		
		Maize-lentil	Harvest crop for fodder purpose		
		Horsegram -wheat	Use crop as green manure/fodder		
	Rain fed high hills	Ramdana-wheat	Harvest crop for fodder purpose		
		Rajma-lentil	Harvest crop for fodder purpose		
		Buckwheat- lentil	Harvest crop for fodder purpose		

### 2.1.1 Rainfed situation: Rabi

Condition	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
			Change in Crop/cropping system	Agronomic measures	Remarks on implementation <sup>e</sup>
Early season drought (delayed onset)	Rain fed lower hills Upland soils	Wheat Rice-wheat	Intercropping Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777)	Maintenance of plant population by gap filling, Weed management	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
Delay by 2 weeks 1st week of January (Normal onset 20th December ± 31 days)		Mustard Soybean-mustard	No change	Short duration Ragi varieties ((VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2), Weed management Maintenance of plant population by gap filling, Balanced fertilizer application	

	Rain fed Mid hills Upland soils	Wheat Rice-wheat	Intercropping Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777)	Maintenance of plant population by gap filling, Weed management
		Lentil Finger Millet – Lentil	No change	Short duration Ragi varieties Weed management, Maintenance of plant population by gap filling, Balanced fertilizer application
		Lentil Maize-Lentil	No change	Short duration maize varieties Maintenance of plant population by gap filling, Weed management
		Wheat Horsegram-wheat	Intercropping Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777)	Maintenance of plant population by gap filling
	3 Rain fed high hills	Lentil Rajma-lentil	No change	Maintenance of plant population by gap filling Weed management Mulching by crop residues, forest leaves Balanced fertilizer application
		Lentil Buckwheat-Lentil	No change	Maintenance of plant population by gap filling Weed management

Condition	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in Crop/cropping system <sup>c</sup>	Suggested Contingency measures	
				Agronomic measures <sup>d</sup>	Remarks on implementation <sup>e</sup>
Early season drought (delayed onset) Delay by 4 weeks 3rd week of January	Rain fed lower hills	Wheat Rice-wheat	Late sown Wheat (VL892) Potato (Kufri Jyoti), green coriander, Spinach Vegetable pea	Weed Management, Foliar application of fertilizers, Bunding of terraces, Increased seed rate, Mulching, Sowing across the slope, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Mustard Soybean- Mustard	Potato (Kufri Jyoti), green coriander, Spinach Vegetable pea	Weed management	
	Rain fed Mid hills	Wheat Rice-wheat	Late sown Wheat (VL892) Potato (Kufri Jyoti), green coriander, Spinach, vegetable pea	Weed Management, Foliar application of fertilizers, Use short duration varieties, Addition of organic manures, (FYM/compost) @ 5-10 t/ha, treated with Trichoderma,, Sowing may be delayed till appropriate soil moisture condition reaches	

		Lentil Finger Millet- Lentil	No change	Transplanting of ragi in standing fields, Weed Management, Foliar application of fertilizers
		Lentil Maize-Lentil	No change	Foliar application of fertilizers
		Wheat Horse gram-Wheat	Late sown Wheat (VL892) Potato (Kufri Jyoti), green coriander, Spinach	Weed Management
	Rain fed high hills	Wheat Ramdana-wheat	Late sown Wheat (VL892) Potato (Kufri Jyoti), green coriander, Spinach	Weed Management
	Lentil Rajma-Lentil	No change	Mulching Weed Management	
	Lentil Buckwheat-lentil	No change	Weed Management	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Change in Crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on implementation <sup>e</sup>
Delay by 6 weeks 1 <sup>st</sup> week of February	Rain fed lower hills	Wheat Rice-wheat	Change of crop, Maize Potato (Kufri Jyoti), Green Coriander, Spinach	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Wheat Soyben-wheat	Potato (Kufri Jyoti), Green Coriander, Spinach		
	Rain fed Mid hills	Wheat Rice-wheat	Change of crop, Maize		
		Lentil FingerMillet- lentil	Potato (Kufri Jyoti), Green Coriander, Spinach		
		Lentil Maize-Lentil	Change of crop		
		Wheat Horsegram- Wheat	Potato (Kufri Jyoti), Green Coriander, Spinach		
		Wheat Ramdana-Wheat	Change of crop, Maize		
		Lentil Rajma- lentil	Potato (Kufri Jyoti), Green Coriander, Spinach		
		Lentil Buckwheat- Lentil	Change of crop		

Condition	Major farming situation <sup>a</sup>	Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
			Change in Crop/cropping system <sup>c</sup>	Agonomic measures <sup>d</sup>	Remarks on implementation <sup>e</sup>
Delay by 8 weeks 3 <sup>rd</sup> week of February	Rain fed lower hills	Wheat Rice-wheat	Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1)	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
		Mustard Soybean- Mustard	Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1)		
	Rain fed Mid hills	Wheat Rice-wheat	Early sowing of Mustard, Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1) radish (Pusa Chetki, Pusa Himani),	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger Millet- Lentil	Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1), radish (Pusa Chetki, Pusa Himani),		
		Lentil Maize-Lentil	Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1), radish (Pusa Chetki, Pusa Himani),		
		Wheat Horsegram- wheat	Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1), radish (Pusa Chetki, Pusa Himani),		
	Rain fed high hills	Wheat Ramdana-wheat	Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1) radish (Pusa Chetki, Pusa Himani),	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Rajma-Lentil	Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1), radish (Pusa Chetki, Pusa Himani),		
		Lentil Buckwheat-	Spinach (Pusa Harit), Chinese cabbage (Palampur		



		Lentil	Green), Veg. Pea (Arkel, VL Ageti, Matar 7), French bean (VL bauni Bean 1), radish (Pusa Chetki, Pusa Himani),		
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### 2.1.2 Irrigated situation

Condition	Major farming situation <sup>f</sup>	Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in Crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on implementation <sup>j</sup>
Delayed/limited release of water in canals due to low rainfall	Irrigated Valley	Paddy-wheat	None	Irrigate crop at critical growth stages	Seed given under IWMP & RKVY Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
	Irrigated mid hills	Paddy-wheat	none	Irrigate crop at critical growth stages	

Condition	Major farming situation <sup>f</sup>	Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in Crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on implementation <sup>j</sup>
Non release of water in canals under delayed onset of monsoon in catchment	Irrigated Valley				CONDITION NA
	Irrigated mid hills				

Condition	Major farming situation <sup>f</sup>	Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in Crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on implementation <sup>j</sup>
Lack of inflows into tanks due to insufficient/delayed onset of monsoon	Irrigated Valley				CONDITION NA
	Irrigated mid hills				

Condition	Major farming situation <sup>f</sup>	Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in Crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on implementation <sup>j</sup>
Insufficient groundwater recharge due to low rainfall	Irrigated Valley				CONDITION NA
	Irrigated mid hills				

Any other condition (specify)					
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## 2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

### 2.2.1 Kharif

Condition	Suggested contingency measure <sup>o</sup>			
continuous high rainfall in as short span leading to water logging	Vegetable stage <sup>k</sup>	Flowering stage <sup>l</sup>	Crop stage <sup>m</sup> maturity	post harvest <sup>n</sup>
Rice	Use wind break and shelter belts and sowing of crop parallel to the wind direction, use of phosphatic fertilizers, use of short stature varieties Strengthening of field bundings, In water logged condition, form open drains about 60cm in depth and 45 cm width across in field	Drain out excess water through drainage channels, NPK foliar application after water drainage	Drainage, avoid water stagnation in the plots	Store the produce under shed and dry using artificial sources like large fans and use mechanical drier.
Maize	From open drainage channels across the field	Drain out excess water through drainage channels,	Cob harvesting from standing crop, drain out excess water	Proper drying and storage of grains
Soybean	From open drainage channels across the field	Drain out excess water through drainage channels,	drain out excess water,	Proper drying and storage of grains
Ragi	From open drainage channels across the field	Drain out excess water through drainage channels,	drain out excess water	Proper drying and storage of grains
<b>Horticulture</b>				
Tomato	Make drainage channel, Ridges and top dressing of N	Improve drainage, spraying of micro nutrients. Avoid water stagnation in the field.	Improve drainage, spraying of micro nutrients. Avoid water stagnation in the field.	Store the produce under shed.
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
Rice, Maize, Finger-millet	In water logged condition, form open drains across the field	Improve drainage, N top dressing	Drainage, avoid water stagnation in the plots, Tying	Store the produce under shed and dry using artificial sources like large fans
<b>Horticulture</b>				
Tomato	Improve drainage, Proper staking	Improve drainage, Top dressing of N, Spraying of Micro nutrients	Improve drainage, Spraying of Micro nutrients	Store the produce under shed.
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Rice	<b>Brown plant hopper</b> : Drain the water before use of insecticides and direct the spray towards	<b>Brown plant hopper</b> : Drain the water before use	<b>Stem Borer</b> : Prolonged moist and humid	Dry the produce up to 14%

	the base of the plants. Monocrotophos @ 1250ml/ha (or) Acephate 500 g/ha <b>Stem Borer</b> : Prolonged moist and humid condition leads to outbreak, Spray Cartap hydrochloride 25kg/ha	of insecticides and direct the spray towards the base of the plants. Monocrotophos @ 500 ml/ac (or) Acephate 200 g/ha <b>Blast</b> : Spray after observing initial infection of the disease, Carbendazim @ 1g/l.	condition leads to outbreak. Spray Cartap hydrochloride 25 kg/ha  <b>False smut in fingermillet and rice</b> : Spray cuprous hydroxide 0.25%	moisture,
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### 2.2.2 Rabi

Condition	Suggested contingency measure <sup>o</sup>			
continuous high rainfall in as short span leading to water logging	Vegetable stage <sup>k</sup>	Flowering stage <sup>l</sup>	Crop maturity stage <sup>m</sup>	post harvest <sup>n</sup>
Wheat	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Top N dress after rain spells, field drainage	Field drainage	Proper storage
Lentil	Drainage	Top N dress after rain spells, field drainage	Field drainage	Proper storage
<b>Horticulture</b>				
Capsicum	Make drainage channel, Ridges and top dressing of N	Improve drainage, spraying of micro nutrients. Avoid water stagnation in the field.	Improve drainage, spraying of micro nutrients. Avoid water stagnation in the field.	Store the produce under shed.
Potato	Drainage, N top dressing, earthing up	Drainage, removing weeds and older leaves for proper aeration	Removing (halms (upper portion)	Keep produce at dry place but not in heap
Frenchbean	Improve drainage	Avoid water stagnation in the field	Remove excess water	Keep produce at dry place but not in heap
Veg pea	Make drainage channel, Avoid water stagnation.	Make drainage channel, Avoid water stagnation, spraying of micro-nutrients.	Remove excess water	Keep produce at dry place but not in heap
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
Wheat and Lentil	Drainage	Top N dress after rain spells, field drainage	Field drainage	Store the produce under shed
<b>Horticulture</b>				
Potato	Drainage, earthing up, N top dressing	Drainage,	Cutting the halms portion	Keep produce at dry place but

Cabbage	Improve drainage, Avoid water stagnation, Spraying of Borax	-	Improve drainage, Avoid water stagnation	not in heap Keep produce at dry place but not in heap
French bean	Improve drainage	Avoid water stagnation in the field	Avoid water stagnation in the field	Store the produce under shed
Veg pea	Proper staking/Drainage	Staking	Safe removal of excess water	Store the produce under shed.
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Wheat	Remove excess water	Remove excess water, fungicide spray	Remove excess water	Dry the produce up to 12-14% moisture,
<b>Horticulture</b>				
Early Veg pea & Capsicum	Wilt in low lying water logged patches : Drench Carbendazim 1.0 g/l at the base of plants	Powdery mildew-spray any sulphur containing fungicide Aphid-Spray Dimethoate	Field drainage	

### 2.3 Floods, (not applicable)

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

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

## 2.5. Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	Increasing area under fodder production, Crops residues and tree fodder storage. Use managers, use chaff cutters, hay storage. Establishment of fodder banks and Stock sufficient Urea Molasses Mineral Block (UMMB), mineral and vitamin mix, 4% urea treatment of dry fodder. Prepare the silage of non-leguminous fodder crops for the scarcity period. Animal insurance	Utilization of fodder from Perennial & reserve sources. Open grazing in forests and alpine slopes/community lands Feeding of crop residues; use of managers and chaff cutters, feeding of household waste, Provide Urea Molasses Mineral Block (UMMB), mineral and vitamin mix, 4% urea treatment of dry fodder	Availing Insurance, culling undesirable Livestock; Raising of short duration fodder crop, replacement of unproductive animals with improved ones
Drinking water	Storage of water in tanks, Traditional water ponds, rivers	Utilization of stored water, Stall drinking	Rejuvenation of water sources
Health and disease management	Advance preparation with medicines. Vaccinate animals against common diseases like FMD, HS, BQ, Rabbits, awareness camps, distribution of first Aids kits.	Treatment of affected livestock by mass campaign, Modern veterinary care, Animal camps.	Proper veterinary care, awareness camps, capacity building of locals, trainings on health care management
<b>Cold wave</b>			
Shelter/environment management	Provision of conventional house, covering of roof with polythene or leaf straw of pines. Brought back from high hill pasture lands to lower hills; restricted open grazing	Keep the animal enclosed with proper heating of house with fire places. Group living, dry grass flooring, gunny bags curtains on windows & door, Jute bags wrapped on the back & belly of animals, restricted open grazing during cold days. Prevent water-logging conditions in animal houses. In Kachha houses, the floor should be elevated. Feeding of straw & hay to animals with concentrates and protect the young ones from cold.	Allow animal for pasture grazing. Massage of milking animals and other species, hot water bath of animals
Health and disease management	Vaccinate & de-worm animals, balanced feeding	Extra vitamins and minerals, extra allowance of balanced feed. Warm living conditions, avoid exposure to cold and rains/snow. The prophylactic and preventive measures for the control of diseases. Deworm animals against endo and ecto-parasites.	Health check-up of animals for any disease.

### 2.5.2 Poultry

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event

<b>Drought</b>			
Shortage of feed ingredients	Surplus storage of poultry feed; No special preparations if they are kept as backyard.	Utilization of stored feed; No impact as they are kept in captivity. Moreover If they are kept as backyard then household waste is sufficient for their keeping.	Availing Insurance for poultry Culling affected & unproductive birds.
Drinking water	Storage of water in tanks	Utilize stored water	Keep birds in open range system
Health and disease management	Advance preparation with medicines and vaccinate birds. Promote hardy and disease resistant poultry birds like broiler, guinea fowl and desi birds procured from reliable sources.	Deworm the birds. Local management	Keep as backyard activity and local health care
<b>Cold wave</b>			
Shelter/environment management	Closed housing with proper ventilation	Proper ventilation for fresh air. and provision of heater/blower during cold waves	Maintain or provide ambient temperature, proper ventilation, hygienic conditions in house
Health and disease management	Vaccination, de-worming	Extra vitamins, minerals and extra allowance of feed.	De-worming, clean environment, treatment if required.

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

### 2.5.3 Fisheries :

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