

## State: UTTARAKHAND

### Agriculture Contingency Plan for District: Almora

<b>1.0</b>	<b>District Agriculture profile</b>		
<b>1.1</b>	<b>Agro-Climatic/ Ecological Zone</b>		
	Agro-Ecological Sub Region (ICAR)	Western Himalayas, Warm Subhumid (To Humid With Inclusion Of Perhumid) Eco-Region 14.2)	
	Agro-Ecological Region (Planning Commission)	West Himalayan Region (I)	
	Agro-climatic zone (NARP)*	Hill zone (UP-1)	
	List all the districts falling under the NARP Zone	Haridwar, Nainital, Almora, Bageshwar, Champawat, Pithoragarh, Pauri, Tehari, Uttarkashi, Dehradun, Chamoli, Rudraprayag	
	Geographic coordinates of district	<b>Latitude</b>	<b>Longitude</b>
		28 <sup>0</sup> 59' and 30 <sup>0</sup> 49' N	70 <sup>0</sup> 20' and 81 <sup>0</sup> 31' E
	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	Krishi Vigyan Kendra, Matella, Distt. Almora Dr R K Sharma, Programme Coordinator, Ph: 05962-241248 (O), 9412995904 (M)	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Dr H S Kushwaha, Professor, Agro meteorology, GBPUA&T, Pantnagar-263145 U S Nagar (UK) India	

<b>1.2</b>	<b>Rainfall</b>	<b>Average (mm)</b>	<b>Normal Onset (specify week and month)</b>	<b>Normal Cessation (specify week and month)</b>
	SW Monsoon (June-Sep)	905.5	2 <sup>nd</sup> week of June	4 <sup>th</sup> week of September
	NE Monsoon (Oct.-Dec)	46.4	4 <sup>th</sup> week of November	4 <sup>th</sup> week of December
	Winter (Jan-Feb)	67.9		
	Summer (Mar-May)	34.7		
	Annual	1054		

<b>1.3</b>	<b>Land use pattern of the district *</b>	<b>Geographical/ Reported Area</b>	<b>Forest Area</b>	<b>Land Under Non Agricultural Use</b>	<b>Permanent Pastures</b>	<b>Cultivable Wasteland</b>	<b>Land Under Misc. Tree Crops and Groves</b>	<b>Barren and Uncultivable Land</b>	<b>Current Fallows</b>	<b>Other Fallows</b>
	<b>Area ('000ha)</b>	464	236	12.5	28.3	37.8	33.9	25.2	14	64.5

\* <http://almora.nic.in/pages/display/170-statistical-handbook-2009>

<b>1.4a</b>	<b>Description of Soils</b>		
		<b>Area ('000 ha)</b>	<b>% Area</b>
	Medium deep, loamy soils		
	Medium deep, loamy-skeletal soils		
	Deep loamy soils		
	<b>Total Area</b>		

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

<b>1.4b</b>	<b>Major soils</b>	<b>Area (Lakh ha)</b>	<b>Percent (%) of Total Area</b>
	Sub mountain	1.10	23.7
	Mountain	0.73	15.7
	Meadow	0.24	5.17
	Skeletal	1.29	27.8
	Others	1.28	27.6

<b>1.5</b>	<b>Agricultural land use *</b>	<b>Area ('000ha)</b>	<b>Cropping intensity %</b>
	Net sown area	83.5	158.9
	Area sown more than once	49.5	
	Gross cropped area	132.7	

\* <http://almora.nic.in/pages/display/170-statistical-handbook-2009>

<b>1.6</b>	<b>Irrigation*</b>	<b>Area ('000 ha)</b>		<b>% Area</b>
	Net irrigated area	5.5		6.6
	Gross irrigated area	9.8		11.7
	Rainfed area	73.7		88.2
	<b>Sources of Irrigation**</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	Canals		1.5	27.8
	Tanks			
	Open wells			
	Bore wells			
	Lift irrigation			
	Other sources		3.9	72.1
	Total		5.5	100
	Pump-sets	103		
	Micro-irrigation			
	No. of Tractors			
	<b>Groundwater availability and use</b>	<b>(%) Area</b>		<b>Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)</b>
	Over exploited			
Critical				
Semi- critical				
Safe			Good	
Waste water availability and use				
Ground water quality				

\*Uttaranchal and UP at a Glance 2005, Jagran Research Centre, \*\* <http://almora.nic.in/pages/display/170-statistical-handbook-2009>

### 1.7 Area under major field crops & horticulture

<b>1.7</b>	<b>Major crops cultivated</b>	<b>Total Area ('000 ha)</b>					
		<b>Kharif</b>		<b>Rabi</b>		<b>Summer</b>	<b>Total</b>
		<b>Irrigated</b>	<b>Rainfed</b>	<b>Irrigated</b>	<b>Rainfed</b>		
	Rice	5.7	14.0				19.7

	Wheat		4.4	41.2		45.6
	Barley		-	3.4		3.4
	<b>Horticulture crops –Fruits</b>	<b>Irrigated</b>	<b>Rainfed</b>		<b>Total Area</b>	
	Pome (Apple + Pear)		4.8		4.8	
	Stone fruit (Peach, Plum, Apricot)		6.5		6.5	
	Nut fruit (walnut)		2.8		2.8	
	Citrus		4.3		4.3	
	Mango		4.5		4.5	
	<b>Horticulture crops – Vegetables</b>	<b>Irrigated</b>	<b>Rainfed</b>		<b>Total Area</b>	
	Capsicum	0.12	0.28		0.4	
	Frenchbean	0.6	0.5		1.1	
	Tomato	0.9	0.18		1.08	
	Veg Pea	0.17	0.42		0.6	
	Onion	0.2			0.2	
	<b>Medicinal and Aromatic crop</b>	<b>Total area</b>	<b>Irrigated</b>		<b>Rainfed</b>	

<b>1.8</b>	<b>Livestock</b>	<b>Number ('000)</b>				
	Cattle	237.7				
	Buffaloes	109.7				
	Total Commercial dairy farms	347.4				
	Goat	171.7				
	Sheep	4.8				
	Others (camel, Pig, Yak etc.)	0.6				

<b>1.9</b>	<b>Poultry</b>	<b>Number ('000)</b>
	Commercial	6.25
	Backyard	56.3

<b>1.10</b>	<b>Inland Fisheries</b>	<b>Area</b>	<b>Yield (t/ha)</b>	<b>Production (tones)</b>
	Brackish water			
	Fresh water			

\* <http://almora.nic.in/pages/display/170-statistical-handbook-2009>

<b>1.11</b>	<b>Production and productivity of major crops</b>	<b>Kharif</b>		<b>Rabi</b>		<b>Summer</b>		<b>Total</b>	
	<b>Crops</b>	<b>Production ('000 t)</b>	<b>Productivity (Kg/ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (Kg/ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (Kg/ha)</b>	<b>Production ('000 t)</b>	<b>Productivity (Kg/ha)</b>
	Rice	27.0	1160					27.0	1160
	Finger millet	46.1	1140					46.1	1140
	Barnyard millet	21.4	1222					21.4	1222
	Maize	2.0	910					2.0	910
	Horsegram	0.7	721					0.7	721
	Soybean	0.3	1116					0.3	1116
	Wheat							42.0	900
	Barley			2.3	696			2.3	696
	<b>Major Horticultural crops</b>	<b>Production ('000 t)</b>			<b>Productivity (kg/ha)</b>			<b>Production (M t)</b>	<b>Productivity (q/ha)</b>
	Apple	14.1			9012			14.1	9012
	Pear	35.0			10590			35.0	10590
	Peach	20.5			12544			20.5	12544
	Plum	20.5			6910			20.5	6910
	Apricot	17.8			7735			17.8	7735
	Nut fruit (walnut)	8.4			2973			8.4	2973
	Mango	9.5			2085			9.5	2085

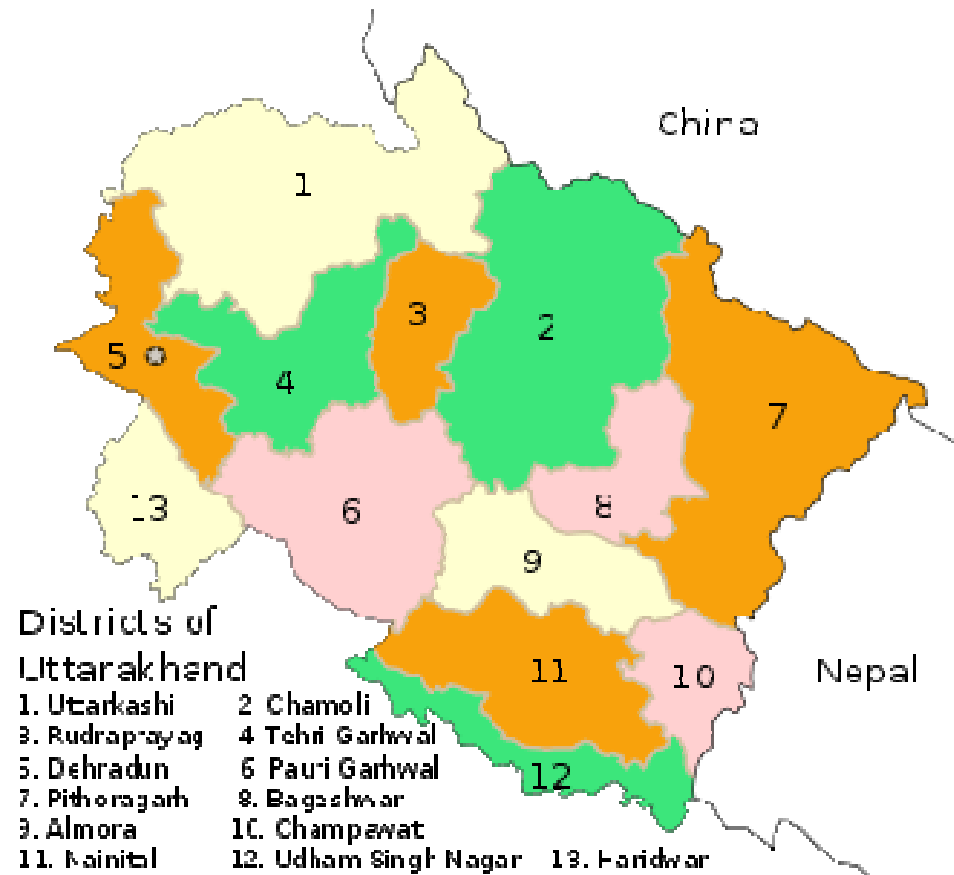
<b>1.12</b>	<b>Sowing window for 5 major crops (start and end of sowing period)</b>	<b>Finger millet</b>	<b>Rice</b>	<b>Barnyard millet</b>	<b>Maize</b>	<b>Soybean</b>
	Kharif – Rainfed	June - July	April-May	May- June	June-July	June-July
	Kharif – Irrigated		May-June			
		<b>Wheat</b>	<b>Barley</b>	<b>Lentil</b>	<b>Rapeseed Mustard</b>	
	Rabi – Rainfed	October- November	October- November	October- November	October- November	
	Rabi – Irrigated	November- December				

\* <http://almora.nic.in/pages/display/170-statistical-handbook-2009>

<b>1.13</b>	<b>What is the major contingency the district is prone to? (Tick mark)</b>	<b>Regular</b>	<b>Occasional</b>	<b>None</b>
	Drought Please tick any one not both		✓	
	Flood			✓
	Cyclone			✓
	Hail storm	✓		
	Heat wave		✓	
	Cold wave	✓		
	Frost	✓		
	Sea water inundation			✓
	Pests and disease outbreak	✓		

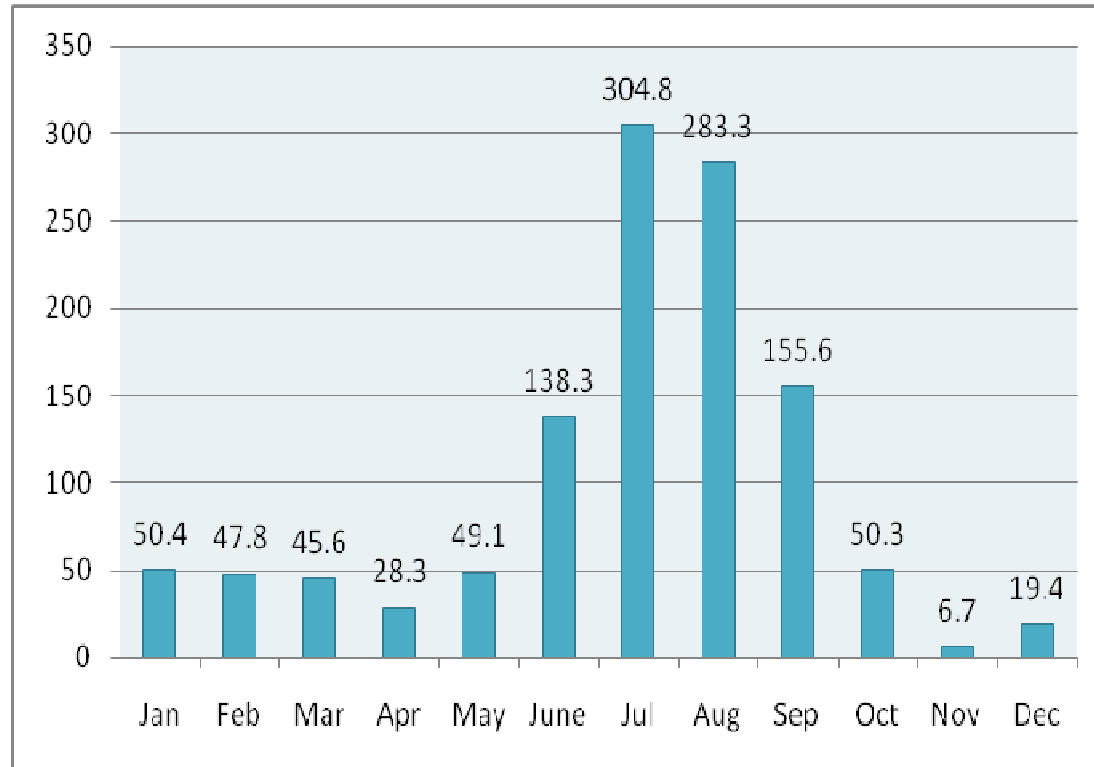
<b>1.14</b>	<b>Include Digital maps of the district</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I



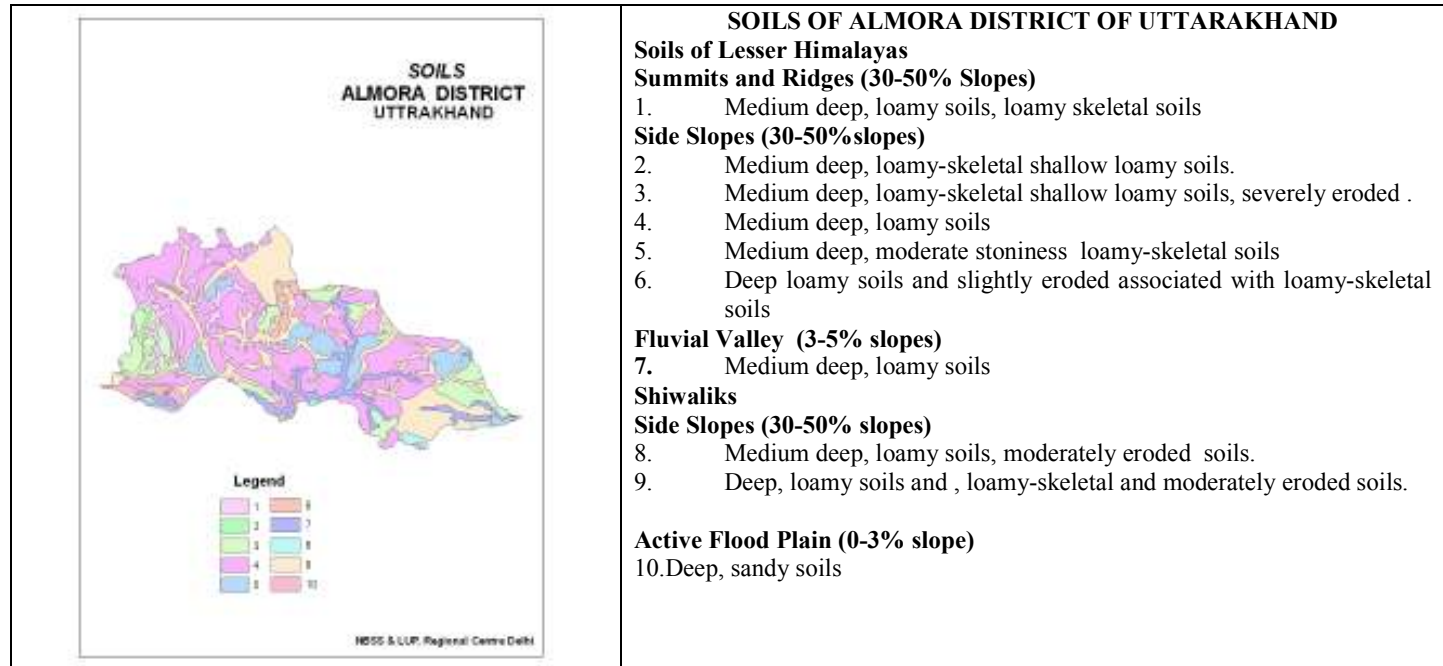
### Annexure II

Mean annual rainfall (mm)





### Annexure III



## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rain fed situation (*Kharif* season)

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Early season drought (delayed onset) Delay by 2 weeks 1 <sup>st</sup> week of July	Rainfed lower hills and Valley soils	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice-Wheat	Cheti/Spring Rice (VL 206, VL 207, VL 208, VL 209)	Life saving water application through low cost drip/ sprayer/sprinkler, Dust mulching,	
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet-Wheat	Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2) + Black Soybean / Horse gram (VLG 1), Barn yard Millet (PRJ-1)	Increased seed rate, Intercropping, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with <i>Trichoderma</i> , Dust mulching,	
		Rice-Wheat	Rice (VL D 221)		
		Rice-Cabbage-Maize (green cob), Rice- Cabbage- Potato	Rice (VLD 81, VD 82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	
	Mid hills south aspect	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea	Cheti/Spring Rice (VL 206, VL 207, VL 208, VL 209)	Life saving water application through low cost drip/ sprayer/sprinkler, Dust mulching,	
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet-Wheat	Finger millets (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)+ Black Soybean / Horse gram (VLG 1)	Increased seed rate, Intercropping, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with <i>Trichoderma</i> , Dust mulching,	
		Maize-Wheat	Maize (Him129, Vivek Hybrid 5, Vivek Maize Hybrid 9, VL Makka 88),  Baby Corn -VL Makka 42	Sowing method, intervention, higher seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha	

	Mid hills north aspect	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea	Cheti/Spring Rice (VL 206, VL 207, VL 208, VL 209)	Life saving water application through low cost drip/ sprayer/sprinkler, Dust mulching,	
		Finger millets + Black Soybean /Horsegram- Wheat	Finger millets + Black Soybean /Horsegram-Wheat	Increased seed rate Intercropping Timely weeding	
		Black Soybean+ Barnyard millet-Veg. Pea	Black Soybean (VL Soya-2, VL Soya-21, 47)+ Barnyard millet (VL Madira-172, 29)	Increased seed rate Intercropping Timely weeding,	
		Black Soybean Horsegram Finger millet Barnyard millet	Black Soybean- Local Horsegram- Local, VLG 1 Finger millet – Local, VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2 Barnyard millet - Local, VL 29, VL 21, VL Madira 172, PRJ 1	Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with Trichoderma	
	High hills	Finger millets mixed with Amaranth/ Pulses	Finger millets( VLM 146, VLM 149, VLM 315, VLM 324) Horsegram (VLG1, VLG 8, VLG 10) / Rice bean  Amaranth (VL Chua-44) + Horsegram/ Rice bean (PRR 1, PRR2)	Increased seed rate Intercropping Timely weeding, Addition of organic matter (compost or FYM)	

Condition	Major Farming situation	Normal crop/cropping system	Suggested contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 4 weeks	Rainfed lower hills and Valley	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice-Wheat	Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)	Change of Crop, Use failed crop as fodder, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with <i>Trichoderma</i>	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK

3 <sup>rd</sup> week of July		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet-Wheat Rice-Wheat	Finger millet (VLM 146)	Use short duration varieties, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with <i>Trichoderma</i> , Sowing may be delayed till appropriate soil moisture condition reaches	
			Change of crop Barnyard millet (VL Madira-172) Blackgram (U-31, 35), Moong (Pant Moong-3,4)		
		Rice-Cabbage-Maize (green cob), Rice- Cabbage- Potato	Change of crop  Finger millet –VLM 146, Barnyard millet (VL Madira-172)		Bunding of terraces, Increased seed rate, Mulching, Sowing across the slope, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with <i>Trichoderma</i>
		Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice-Wheat	Change of crop Finger millets (VLM 146)		Increased seed rate Mulching, Sowing across the slope, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with <i>Trichoderma</i>
	Mid hills south aspect	<i>Chaiti</i> /Spring Rice (Sowing in end march to mid april)- Veg. Pea	Black Soybean+ Barnyard millet (VL 29, VL 21, VL Madira 172, PRJ 1)	Change of crops, use failed crop as fodder, Increased seed rate, Intercropping, Timely weeding	
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Wheat	Horsegram, VL-8		
		Maize-Wheat	Finger millet –VLM 146 Rajma (VL- Rajma 63, 125)		
	Mid hills north aspect	<i>Chaiti</i> /Spring Rice (Sowing in end march to mid april)- Veg. Pea	CowPea (Pusa Komal) Rajma (VL- Rajma 63)  Fingermillet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)-Wheat	Change of crops Increased seed rate Intercropping Timely weeding	
		Finger millets + Black Soybean /Horsegram-Wheat	Black Soybean+ Barnyard millet- Wheat		
		Black Soybean+ Barnyard millet-Pea	Spring Rice- Local, VL 206, VL 207, VL 208, VL 209		

			Black Soybean- Local Horsegram- Local, VLG 1 Finger millet – Local, VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2 Barnyard millet - Local, VL 29, VL 21, VL Madira 172, PRJ 1		
		Spring Rice- Local, VL Black Soybean- Local Horsegram- Local, Finger millet – Local, Barnyard millet - Local	Finger millets + Horsegram/ Rice bean Amaranth + Horsegram/ Rice bean	Increased seed rate Intercropping Timely weeding	
	High hills	Finger millets mixed with Amaranth/ Pulses	Finger millet –VLM 146, VLM 149, VLM 315, VLM 324 Amaranth – PRA 123, VL Chua 44 Rice Bean – PRR 1, PRR2 Horsegram- VLG1, VLG 8, VLG 10		

Condition	Major Farming situation	Normal crop/cropping system	Suggested contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 6 weeks  2 <sup>nd</sup> week of Aug	Rainfed lower hills and Valley	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice-Wheat	Radish (Pusa Chetki, Pusa Himani), Veg. french bean (Laxmi, Arka Komal), Cauliflower (Pusa Dipali, Improved Japani), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach, French bean (VL bauni Bean 1)	Proper drainage	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK
Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet-W heat					
Rice-Wheat					
Rice-cabbage-Maize (green cob), Rice-Cabbage- Potato		Green fodder (Jowar) Radish (Pusa Chetki, Pusa Himani), Veg. french bean (Laxmi, Arka Komal), Cauliflower (Pusa			

			Dipali, Improved Japani), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride), Coriander, Spinach		
	Mid hills south aspect	Chaiti/Spring Rice (Sowing in end march to mid april)-Veg. Pea	Green fodder (Chari) Radish (Pusa Chetki, Pusa Himani), Veg. french bean (Laxmi, Arka Komal), Cauliflower (Pusa Dipali, Improved Japani), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride), Coriander, Spinach	Proper drainage	
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Wheat			
		Maize-Wheat			
	Mid hills north aspect	Chaiti/Spring Rice (Sowing in end march to mid april)-Veg. Pea	Green fodder (Chari) Radish (Pusa Chetki, Pusa Himani), Veg. french bean (Laxmi, Arka Komal), Cauliflower (Pusa Dipali, Improved Japani), Cabbage (Golden Acre/Pusa Mukta), Tomato (Palam Pink, Palam Pride), Coriander, Spinach	Proper drainage	
		Finger millets + Black Soybean /Horsegram-Wheat			
		Black Soybean+ Barnyard millet-Pea			
		Black Soybean Horsegram Finger millet, Barnyard millet			
	High hills	Finger millets mixed with Amaranth/ Pulses			

Condition	Major Farming situation	Normal crop/cropping system	Suggested contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 8 weeks 4 <sup>th</sup> week of Aug	Rainfed lower hills and Valley	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice- Wheat Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Proper drainage	Supply of seeds through TDC, NSC Dept. of Agriculture and KVK

		Barnyard Millet-Wheat			
		Rice-Wheat Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice-Wheat Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet-Wheat	Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green), Veg. Pea (Arkel, VL Ageti Matar 7), French bean (VL bauni Bean 1) Green fodder (Barley), Green fodder (Berseem, Oats) Wheat (VL-829, HPW-251), Barley (Vimal), Barley (HBL-276) Garlic : GHC 1 Fodder oats : Palampur-1, & Kent		
		Rice-Wheat	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green) Green fodder (Barley), Green fodder (Berseem, Oats) Wheat (VL-829, HPW-251), Barley (Vimal), Barley (HBL-276) Garlic : GHC 1 Fodder oats : Palampur-1, & Kent	Proper drainage	
	Mid hills south aspect	Chaiti/Spring Rice (Sowing in end march to mid april)-Veg. Pea Finger millet- Pea, Fingermillet-Lentil,	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green) Green fodder (Barley), Green fodder (Berseem, Oats)	Proper drainage	

		Finger millet-Wheat	Wheat (VL-829, HPW-251), Barley (Vimal), Barley (HBL-276)		
			Garlic : GHC 1		
		Maize-Wheat	Fodder oats : Palampur-1, & Kent		
Mid hills north aspect		Chaiti/Spring Rice (Sowing in end march to mid april)-Veg. Pea	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Proper drainage	
			Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green)		
		Finger millets + Black Soybean /Horsegram	Green fodder (Barley), Green fodder (Berseem, Oats)		
		Black Soybean+ Barnyard millet-Pea	Wheat (VL-829, HPW-251), Barley (Vimal), Barley (HBL-276)		
		Spring Rice, Black Soybean Horsegram Finger millet ,Barnyard millet	Garlic : GHC 1 Fodder oats : Palampur-1, & Kent		
High hills		Finger millets mixed with Amaranth/ Pulses	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	-	
			Toria (Bhawani), Spinach (Pusa Harit), Chinese cabbage (Palampur Green)		
			Green fodder (Barley), Green fodder (Berseem, Oats)		
			Wheat (VL-829, HPW-251), Barley (Vimal), Barley (HBL-276)		
			Garlic : GHC 1 Fodder oats : Palampur-1, & Kent		



Condition	Suggested contingency measures				
Early season drought (Normal onset)	Major farming situation	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on implementation
(Normal date of onset of monsoon 1 <sup>st</sup> week of July) followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Rainfed lower hills and Valley	Cheti/Spring Rice (End Mach - Mid April)-Veg. Pea Cheti Rice-Wheat	No Change	Spray of NPK solution or N Top dress recommendation coinciding with rain splashes; rain water harvesting of surrounding fields, Mulching, Bunding, life saving irrigation	Construction of rain water harvesting ponds through IWMP and MNREGS Constructing rain water harvesting ponds through IWMP and MNREGS
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet-Wheat	Gap filling/re-sowing	Rain water harvesting of surrounding fields, Use local available plant material for mulch, Bunding, life saving irrigation	
		Rice-Wheat	Gap filling through seedlings	Rain water harvesting of surrounding fields, Use local available plant material for mulch, Bunding, life saving irrigation	
	Mid hills south aspect	Cheti/Spring Rice (End Mach - Mid April)-Veg. Pea	No Change	N-Top dress recommendation coinciding with rain splashes rain water harvesting of surrounding fields, Use local available plant material for mulch	
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Wheat	Gap filling/re-sowing		
		Maize-Wheat			
	Mid hills north aspect	Cheti/Spring Rice (End Mach - Mid April)-Veg. Pea	No Change	Spray of NPK solution or N Top dress recommendation coinciding with rain splashes; rain water harvesting of surrounding fields, Mulching, Bunding, life saving irrigation	
		Finger millets + Black Soybean /Horsegram Black Soybean+ Barnyard millet-Pea	No Change		
		Black Soybean Horsegram	Gap filling through seedlings		

		Finger millet ,Barnyard millet			
	High hills	Finger millets mixed with Amaranth/ Pulses	Gap filling/re-sowing	Top N dress recommendation of Rain fed crop coinciding with rain splashes; rain water harvesting of surrounding fields, Use local available plant material for mulch	

Condition	Suggested contingency measures				
Early season drought (Normal onset)	Major farming situation	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (<2.5 mm) period  At vegetative stage	Rainfed lower hills and Valley	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice-Wheat	Use anti-transpirants, life saving irrigation if available	Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their <i>in-situ</i> mulching, Use local available plant material for mulch	Construction of rain water harvesting ponds through IWMP and MNREGS as a long term drought proofing measure
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet- Wheat			
		Rice-Wheat			
	Mid hills south aspect	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea	Use anti-transpirants, life saving irrigation if available, Thinning for reducing plant population	Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their <i>in-situ</i> mulching, Use local available plant material for mulch	
		Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Wheat			
		Maize-Wheat			
Mid hills north aspect	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea	Use anti-transpirants, life saving irrigation if available, Thinning for reducing plant population	Spray of NPK or N Top dress recommendation of Rainfed crop coinciding with rain splashes; rain		

		Finger millets + Black Soybean /Horsegram Black Soybean+ Barnyard millet-Pea	Use anti-transpirants, life saving irrigation if available, Thinning for reducing plant population	water harvesting of surrounding fields, Mulching, Bunding, life saving irrigation	
		Spring Rice, Black Soybean Horse gram Finger millet ,Barnyard millet	Use anti-transpirants, life saving irrigation if available, Thinning for reducing plant population		
	High hills	Finger millets mixed with Amaranth/ Pulses	Use anti-transpirants, life saving irrigation if available, Thinning for reducing plant population	Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their <i>in-situ</i> mulching, Use local available plant material for mulch	

Condition	Suggested contingency measures				
	Major farming situation	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on implementation
<b>Early season drought (Normal onset)</b>  <b>At reproductive stage and terminal stage</b>	Rainfed lower hills and Valley	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Cheti Rice-Wheat Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Fallow Barnyard Millet-Wheat Rice-Wheat	Site-specific crop management technologies: <ul style="list-style-type: none"> <li>• If crop stand is poor then use of crop as fodder.</li> <li>• Thinning</li> <li>• Life saving irrigation from rain water harvest ponds,</li> <li>• Weeding and Weed mulching</li> <li>• Anti-transpirant spray</li> <li>• Salicylic acid spray to induce early maturity</li> <li>• Harvesting at physiological maturity</li> <li>• Harvest whatever crop is available and immediately conserve the soil moisture for <i>Rabi</i> crops</li> </ul>	Foliar N management (1 % urea spray) instead of Top N dress only if the crop stand is still better, Spray of potassium nitrate and potassium chloride, and Use local available plant material for mulch.	Construction of rain water harvesting ponds through IWMP and MNREGS as a long term drought proofing measure

			<ul style="list-style-type: none"> <li>• If rain comes Toria sowing in mid September</li> </ul>	
Mid hills south aspect	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea	<ul style="list-style-type: none"> <li>• Site-specific crop management technologies:</li> <li>• Life saving irrigation, if available</li> <li>• Anti-transpirant spray</li> <li>• Salicylic acid spray to induce earliness</li> <li>• If grain setting has occurred in maize, de tasseling can be done to reduce transpiration</li> <li>• Harvesting at physiological maturity</li> <li>• Harvest whatever crop is available and immediately conserve the soil moisture for <i>Rabi</i> crops</li> </ul>	<ul style="list-style-type: none"> <li>• Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their <i>in-situ</i> mulching, Use local available plant material for mulch</li> </ul>	
	Finger millet- Pea, Fingermillet-Lentil, Fingermillet-Wheat			
	Maize-Wheat			
Mid hills north aspect	Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea	<ul style="list-style-type: none"> <li>• Site-specific crop management technologies:</li> <li>• Life saving irrigation, if available</li> <li>• Anti-transpirant spray</li> <li>• Salicylic acid spray to induce earliness.</li> <li>• Harvesting at physiological maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Foliar N management (1 % urea spray) instead of top N dress; Efficient weed management and their <i>in-situ</i> mulching, Use local available plant material for mulch</li> </ul>	
	Finger millets + Black Soybean /Horsegram Black Soybean+ Barnyard millet-Pea			
	Spring Rice, Black Soybean Horsegram Finger millet, Barnyard millet.			
High hills	Finger millets mixed with Amaranth/ Pulses	<ul style="list-style-type: none"> <li>• Site-specific crop management technologies:</li> <li>• Life saving irrigation, if available</li> <li>• Anti-transpirant spray.</li> <li>• Salicylic acid spray to induce earliness.</li> <li>• Harvesting at physiological maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Foliar N management (1 % urea spray) instead of top N dress; Efficient weed management and their <i>in-situ</i> mulching, Use local available plant material for mulch</li> </ul>	

2.1.2 Rain fed situation (*Rabi* season)

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 2 weeks  1 <sup>st</sup> week of January  (Normal onset 20 <sup>th</sup> December ± 31 days)	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Intercropping Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777),		
	Mid hills south aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	No change		
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Intercropping Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777),		
	Mid hills north aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	No change		
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Intercropping Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777),		

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 4 weeks 3 <sup>rd</sup> week of January	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- Veg. Pea	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Late sown Wheat (VL892) Potato (Kufri Jyoti), green coriander, Spinach		
	Mid hills south aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	No change		
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Late sown Wheat (VL892,) Potato (Kufri Jyoti), Green coriander, Spinach		
	Mid hills north aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	No change		
		Lentil Finger millet-Lentil	No change		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Late sown Wheat (VL892,) Potato (Kufri Jyoti), green coriander, Spinach		

Condition	Major Farming	Normal Crop/ cropping	Suggested contingency measure
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Delay by 6 weeks	situation	system	Change in crop/ cropping system	Agronomic measure	Remarks on implementation
1 <sup>st</sup> week of February	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	Change of crop Potato (Kufri Jyoti), green coriander, Spinach	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), green coriander, Spinach		
	Mid hills south aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), green coriander, Spinach		
	Mid hills north aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Wheat Rice-Wheat/Barley, Finger millet-Wheat	Potato (Kufri Jyoti), green coriander, Spinach		

Condition	Major Farming	Normal Crop/ cropping	Suggested contingency measure
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	situation	system	Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 8 weeks  3 <sup>rd</sup> week of February	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- Veg. Pea	Change of crop Potato (Kufri Jyoti), green coriander, Spinach	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
		Lentil Fingermillet-Lentil	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Wheat Rice-Wheat/Barley, Fingermillet-Wheat	Potato (Kufri Jyoti), green coriander, Spinach		
	Mid hills south aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Lentil Fingermillet-Lentil	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Wheat Rice-Wheat/Barley, Fingermillet-Wheat	Potato (Kufri Jyoti), green coriander, Spinach		
	Mid hills north aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Lentil Finger millet-Lentil	Change of crop Potato (Kufri Jyoti), green coriander, Spinach		
		Wheat <b>Rice-Wheat/Barley, Finger millet-Wheat</b>	Potato (Kufri Jyoti), green coriander, Spinach		



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

Condition	Major Farming	Normal Crop/ cropping	Suggested contingency measure
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<b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b>  <b>At vegetative stage</b>	Rainfed lower hills and Valley	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- Veg. Pea	Site-specific crop management technologies	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil Fingermillet-Lentil			
		Wheat Rice-Wheat/Barley, Fingermillet-Wheat			
	Mid hills south aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea			
		Lentil Finger millet-Lentil			
		Wheat Rice-Wheat/Barley, Finger millet-Wheat			
	Mid hills north aspect	Vegetable Pea Cheti/Spring Rice (End Mach -Mid April)-Veg. Pea Finger millet- veg. Pea			
		Lentil Fingermillet-Lentil			
		Wheat Rice-Wheat/Barley, Finger millet-Wheat			

### 2.1.3 Irrigated situation (Kharif Season)

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 2 week					

	lower hills and Valley	Rice-Wheat	Rice (VLD 81, VD 82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
		Rice-Cabbage-Maize (green cob), Rice- Cabbage- Potato	Rice (VLD 81, VD 82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 4 weeks	Lower hills and Valley	Rice-Wheat	Rice (VLD 81, VD 82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
3 <sup>rd</sup> week of July		Rice-Cabbage-Maize (green cob), Rice- Cabbage- Potato	Rice (VLD 81, VD 82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 6 weeks	Lower hills and Valley	Rice-Wheat	Rice (VLD 81, VD 82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
1 <sup>st</sup> week of August		Rice-Cabbage-Maize (green cob), Rice- Cabbage- Potato	Rice (VLD 81, VD 82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 8 weeks					

3 <sup>rd</sup> week of August	lower hills and Valley	Rice-Wheat	Rice (VLD 81, VD 82, VLD61, VD 62)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	-Nil-
		Rice-Cabbage-Maize (green cob), Rice- Cabbage- Potato	Rice (VLD 81, VD 82, VLD61, VD 62)	Light irrigation, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha	

### 2.1.3 Irrigated situation (Rabi Season)

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 2 weeks	lower hills and Valley	Wheat Rice-Wheat	Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777),	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
1 <sup>st</sup> week of January					

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation
Delay by 4 weeks	lower hills and Valley	Wheat Rice-Wheat	Late sown Wheat (VL892, HS-420, HPW-42, Raj 3777)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
3 <sup>rd</sup> week of January					

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	Agronomic measure	Remarks on implementation

<b>Delay by 6 weeks</b> <b>1<sup>st</sup> week of February</b>	lower hills and Valley	Wheat Rice-Wheat	Change of Crop Potato (Kufri Jyoti), green coriander, Spinach	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
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<b>Condition</b>	<b>Major Farming situation</b>	<b>Normal Crop/ cropping system</b>	<b>Suggested contingency measure</b>		
<b>Delay by 8 weeks</b>			<b>Change in crop/ cropping system</b>	<b>Agronomic measure</b>	<b>Remarks on implementation</b>
<b>3<sup>rd</sup> week of February</b>	lower hills and Valley	<b>Wheat</b> Rice-Wheat	Change of Crop Potato (Kufri Jyoti), green coriander, Spinach	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	-Nil-

<b>Condition</b>	<b>Suggested Contingency measures</b>				
	<b>Major farming situation</b>	<b>Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Agronomic measures</b>	<b>Remarks on implementation</b>
Non release of water in canals under delayed onset of rainfall in catchment	Not applicable				

<b>Condition</b>	<b>Suggested contingency measures</b>				
	<b>Major farming situation</b>	<b>Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Agronomic measures</b>	<b>Remarks on implementation</b>
Lack of inflows into tanks due to insufficient /delayed onset of rainfall	Not applicable				

<b>Condition</b>	<b>Suggested contingency measures</b>				
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	Major farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
Insufficient groundwater recharge due to low rainfall	Not applicable				
Any other condition (specify)	Not applicable				

### 2.2.1 Unusual rains (untimely, unseasonal etc) (for both Rain fed and irrigated situations) Kharif season

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
<b>Continuous high rainfall in a short span leading to water logging</b>				
Rice	Strengthening of field bundings, In water logged condition, form open drains about 60cm in depth and 45cm width across the field	Drain out excess water through drainage channels, NPK foliar application after water draining	Drain out excess water Harvesting at physiological maturity	Storage at safer farmer warehouse/tent covering of produce, proper drying and storage of grains, use mechanical drier
Finger-millet, Maize	Form open drainage channels across the field	Drain out excess water through drainage channel	Cob harvesting from standing crop, drain out excess water, Harvesting at physiological maturity	Proper drying and storage of grains
Green fodder	Form open drainage channels across the field	Drain out excess water through drainage channel	Not applicable	
<b>Horticulture</b>				
Apple, Pear, Peach, Plum				Proper storage and immediate transportation to market/godown
Vegetable Pea, Potato, Tomato, Cucurbits	Form open drainage channels across the field	Drain out excess water through drainage channel	Harvesting at proper stage	Storage and immediate transportation to market

<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
Rice, Maize, Finger-millet, Black Soybean	In water logged condition, form open drains across the field	Drain out excess water through drainage channel	Drain out excess water Harvesting at physiological maturity	Storage at safer warehouse, Proper drying and storage of grains
<b>Horticulture</b>				
Pome Fruits (Apple& Pear)	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Earthing up around the trunk</li> <li>• Soil working to improve soil aeration and control weeds</li> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Earthing up around the trunk</li> <li>• Soil working to improve soil aeration and control weeds</li> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> <li>• Hormonal or multinutrient spray for promoting flowering /fruit set.</li> <li>• Use supplement pollination techniques to improve pollination and fruit set.</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Till the soil within the basin to improve soil aeration and control weeds</li> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Harvest the fruit on clear sunny day</li> <li>• Proper storage and immediate transportation to market/godown</li> </ul>
Other Temperate Fruits (Stone Fruit)	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Earthing up around the trunk</li> <li>• Soil working to improve soil aeration and to control weeds</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Earthing up around the trunk</li> <li>• Soil working to improve soil aeration and to control weeds</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Till the soil within the basin to improve soil aeration and to control weeds</li> <li>• Apply 40-50 kg FYM/</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Harvest the fruit on clear sunny day</li> </ul>

	<ul style="list-style-type: none"> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> </ul>	<ul style="list-style-type: none"> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> <li>• Hormonal or multinutrient spray for promoting flowering /fruit set.</li> <li>• Use supplement pollination techniques to improve pollination and fruit set.</li> </ul>	tree or recommended nutrients	
Walnut & Dry Fruits	Complete drainage, Channelization of excess water	Complete drainage, Channelization of excess water	Complete drainage, Channelization of excess water	Complete drainage, Channelization of excess water
Other fruits	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Earthing up around the trunk</li> <li>• Till the soil to improve soil aeration and to control weeds</li> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Earthing up around the trunk</li> <li>• Till the soil to improve soil aeration and to control weeds</li> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> <li>• Hormonal or multinutrient spray for promoting flowering /fruit set.</li> <li>• Use supplement pollination techniques to improve pollination and fruit set.</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Till the soil within the basin to improve soil aeration and to control weeds</li> <li>• Apply 40-50 kg FYM/ tree or recommended nutrients</li> </ul>	<ul style="list-style-type: none"> <li>• Complete drainage, Channelization of excess water</li> <li>• Harvest the fruit on clear sunny day</li> </ul>
Vegetables (Pea, Tomato, Cucurbits)	Proper Staking/Drainage	Staking	Field drainage	Storage and immediate transportation to market



<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Rice and Finger millet	<p><b>Brown plant hopper</b> Drain the water before use of insecticides and direct the spray towards the base of the plants. Monocrotophos @ 1250ml/ha (or) Acephate 500 g/ha</p> <p><b>Stem Borer:</b> Prolonged moist and humid condition leads to outbreak. Spray Cartap hydrochloride 25 kg/ha</p>	<p><b>Brown plant hopper</b> Drain water before use of insecticides and direct the spray towards the base of the plants. Monocrotophos @ 500 ml/ac. (or) Acephate 200 g /ac.</p> <p><b>Blast:</b> Spray after observing initial infection of the disease, Carbendazim @ 1 g/l.</p>	<p><b>Stem Borer:</b> Prolonged moist and humid condition leads to outbreak. Spray Cartap hydrochloride 25 kg/ha</p> <p><b>False smut in fingermillet and Rice:</b> Spray cuprous hydroxide 0.25 %</p>	
Maize	Proper Drainage	Top N dress after rain spells	Field drainage	
Veg. Pea & Capsicum	<p><b>Wilt</b> in low lying water logged patches: Drench Carbendazim 1.0 g/l at the base of plants</p>	<p><b>Root rot:</b> Soil drenching with carbendazim 0.1 %, <b>Powdery mildew:</b> Spray carbendazim 0.1 %</p>		
<b>Horticulture</b>				
Apple	<p><b>Apple scab :</b> Follow the recommended schedule for the control of Apple scab</p> <p><b>White root rot :</b> Drain out excess water from the basin and drench the basin with Carbendazim 200g, or copper sulphate 100 g / 200 l water (3-4 time at an interval of 15-20 days)</p>	<p><b>Apple scab :</b> Follow the recommended schedule for the control of Apple scab</p> <p><b>White root rot :</b> Drain out excess water from the basin and drench the basin with Carbendazim 200g, or copper sulphate 100 g / 200 l water (3-4 time at an interval of 15-20 days)</p>	<p><b>Premature leaf Fall:</b> Follow the recommended spray schedule</p>	Proper storage and immediate transportation to market/godown
Early Veg Pea and Capsicum	<b>Wilt</b> in low lying	<b>Root rot:</b> Soil drenching	Field drainage	

	water logged patches: Drench Carbendazim 1.0 g/l at the base of plants	with carbendazim 0.1 %, <b>Powdery mildew:</b> Spray Carbendazim 0.1 %		
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### 2.2.2 Unusual rains (untimely, unseasonal etc) (for both Rain fed and irrigated situations) Rabi season

Condition	Suggested contingency measure				
<b>Continuous high rainfall in a short span leading to water logging</b>	<b>Vegetative stage</b>	<b>Flowering stage</b>	<b>Crop maturity stage</b>	<b>Post harvest</b>	
	Wheat	Drainage	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>					
Vegetable Pea	Drainage/IDM/IPM	IDM/IPM	Field drainage	Storage and immediate transportation to market	
Potato	Drainage/IDM/IPM	IDM/IPM	Field drainage	Storage and immediate transportation to market	
Cole crops	Drainage/IDM/IPM	IDM/IPM	Field drainage	Storage and immediate transportation to market	
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>					
Wheat	Drainage	Top N dress after rain spells	Field drainage	Storage and immediate transportation to market	
Lentil	Drainage	Top N dress after rain spells	Field drainage	Storage and immediate transportation to market	
<b>Horticulture</b>					
Pea	Staking/Drainage	Staking	Field drainage	Storage and immediate transportation to market	
Potato	Drainage		Field drainage	Storage and immediate transportation to market	
Cole crops	Drainage		Field drainage	Storage and immediate transportation to market	
<b>Outbreak of pests and diseases due to unseasonal rains</b>					
Wheat	Drainage	Top N dress after rain spells	Field drainage	Storage and immediate transportation to market	
Lentil	Drainage	Top N dress after rain spells	Field drainage	Storage and immediate transportation to market	
<b>Horticulture</b>					
Pea	Staking/Drainage/IDM/IPM	Staking/IDM/IPM	Field drainage	Storage and immediate transportation to market	

Potato	Drainage/IDM/IPM	IDM/IPM	Field drainage	Storage and immediate transportation to market
Cole crops	Drainage/IDM/IPM	IDM/IPM	Field drainage	Storage and immediate transportation to market

### 2.3 Floods - Not Applicable

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Continuous submergence for more than 2 days				
Sea water inundation				

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

Extreme event type	Suggested contingency measure <sup>f</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Heat Wave</b>				
Wheat	Life saving irrigation	Life saving irrigation	Life saving irrigation (Terminal heat)	
<b>Cold wave</b>				
Mango		Provision of Shelter belt and wind break at the time of orchard establishment	Pruning of dead shoots/burned shoots followed by light irrigation	
<b>Frost</b>				
Mango		Irrigation, Fuming in the orchard	Pruning of dead shoots/burned shoots followed by light irrigation	
<b>Hailstrom</b>				
Apple			Anti hail netting at fruit bearing stage/Anti hail guns installation at Departmental level	
<b>Cyclone</b>	Not applicable			

### 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; Collect crop residues, and tree fodder to store at safe	Utilization of fodder from Perennial & reserve sources, Open grazing in forests and alpine slopes/ community lands,	Availing Insurance, culling undesirable Livestock; Raising of fodder trees, replacement of

	place, Use mangers, use chaff cutters, hay storage, and establish fodder banks and Stock sufficient Urea Molasses Mineral Block (UMMB), mineral and vitamin mix, 4% urea treatment of dry fodder	Feeding of crop residues; use of mangers and chaff cutters, feeding of household waste, Prepare the silage of non-leguminous fodder crops for the scarcity period, Provide Urea Molasses Mineral Block (UMMB), mineral and vitamin mix, 4% urea treatment of dry fodder.	unproductive animals with improved ones
Drinking water	Storage of water in tanks , Traditional water ponds , rivers	Utilization of stored water, Stall drinking , rivers , traditional water ponds	Rejuvenation of water sources
Health and disease management	Advance preparation with medicines and vaccination, local ethno pharmaceutical and alternate medicines, keeping of disease resistance varieties.	Treatment of affected livestock by mass campaign, Modern veterinary care , veterinary camps , insulation, create smoke during nights in the cattle sheds to protect animals from mosquito and fleabites	Proper veterinary care , awareness , capacity building of locals, health care management
<b>Floods</b>	Not Applicable		
<b>Cyclone</b>	Not Applicable		
<b>Cold wave</b>			
Shelter/environment management	Brought back from high hill pasture lands to nearby pastures; restricted open grazing,	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 & other fodder to milch animals with concentrates and protect the young ones from cold.	Open grazing, grazing in open sun , massage of milking animals and other species, hot water bath of animals
Health and disease management	Traditional herbs fed to animals	Warm living conditions, syrup of lassi (curd juice) after roasting fed to animals, avoid exposure to cold and rains/ snow. The prophylactic and preventive measures for the control of diseases should be adopted on the advice of veterinarian. For control of liver flukes, do the deworming of animals.	Open grazing in sunny days and feeding of medicinal herbs. In case of acute problem , veterinary care

### 2.5.2 Poultry

	<b>Suggested contingency measures</b>	<b>Convergence/linkages with ongoing programs, if any</b>
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	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 these are kept as backyard activity	<ul style="list-style-type: none"> <li>Utilization of surplus feed; No impact as these is kept in captivity.</li> <li>Moreover these are kept as backyard and household waste is sufficient for their keeping</li> </ul>	Kept as backyard activity Availing Insurance Culling affected birds	Feed can be supplied through fair pRice shops , cooperatives and the SHGs/ VOs
Drinking water	Storage of water in tanks	Utilize stored water	Kept as backyard activity	Water storage structures can be constructed in collaboration with MNERAGA
Health and disease management	<ul style="list-style-type: none"> <li>Advance preparation with medicines and vaccination</li> <li>Promote hardy and disease resistant poultry birds like broiler, guinea fowl and desi birds procured from reliable sources.</li> </ul>	Mass Vaccination, Locally managed with the help of veterinary care	Kept as backyard activity and local health care is practiced	Collaboration with rural development programmes
<b>Floods</b>	Not applicable			

### 2.5.3 Fisheries:

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
<b>Drought</b>			
Shallow water in ponds due to insufficient rains/inflows	<ul style="list-style-type: none"> <li>Water harvesting structures with rain water impounding from catchment areas</li> <li>Keep a deeper portion as a refuge pond / depression/trench preferably at lower side of pond</li> </ul>	<ul style="list-style-type: none"> <li>Up to 50% of pond surface area may be covered with floating algae like azolla to reduce evaporation.</li> <li>Water to supplement at least 20% of the impoundment of pond to safeguard the stocked fish biomass may be arranged if available.</li> <li>Partial or complete fish harvesting may be done in extreme events to reduce the density.</li> </ul>	Water harvesting structures with rain water impounding from catchment areas; watershed development planning and implementations with focus on renovation and desilting of pond.
Impact of heat and salt load build up in ponds / change in water quality			
<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		

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