State: Uttarakhand
Agriculture Contingency Plan for District: Bageshwar

1.0	**District Agriculture profile**			
1.1	Agro-Climatic/Ecological Zone			
	Agro-Climatic Region (Planning Commission)	Western Himalayan Region (I)		
	Agro Climatic Zone (NARP)	UK Region II- Mid hills (Sub humid- 801-1800 m), UK Region III- High hills (Temperate 1801-2200 m), UK Region IV- Very high hills (> 2200 m)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Bageshwar, Almora, Pithoragarh, Champawat, Nainital, Chamoli, Uttarkashi, Tehri Garhwal,Pauri Garhwal and Rudraprayag,		
	Geographic coordinates of district	Latitude	Longitude	Altitude (m)
		29° 86' N	79°77 ' E	801- >2200 meters
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	CIMAP, (CSIR), Purula, Garur, Bageshwar (Uttarakhand)		
	Mention the KVK located in the district with address (This information available in ICAR phone directory which is available on ICAR website)	Dr. Vijay Avinashilingam N.A.(Programme Coordinator) Krishi Vigyan Kendra, Kafligair, District- Bageshwar- 263628 (Uttarakhand) Phone & Fax No.- 05963-255150 E_mail- kvkbageshwar@gmail.com		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	IMD Unit, Mukteshwar		

***** Source: District Agricultural Technology Matrix for Uttarakhand, GBPUA&T, Pantnagar

1.2	**Rainfall – (since 2006 - 2012)**	**Average (mm)**	**Normal onset**	**Normal cessation**
	SW monsoon (June – Sep)	1407.6	Last week of June or 1st week of July	2nd week of Sept
	NE Monsoon (Oct – Dec)	31.2	2nd week of December	4th week of December
	Winter (Jan – Feb)	40.2	1st week of January	4th week of February
	Summer (March – May)	132.0	1st week of March	4th week of May
	Annual	1598.8	-	-

***** Source: Irrigation Department, Bageshwar

1.3	Land use pattern of the district (latest statistics)	Geograp hical Area	Cultivable area (Give net cultivable area)	Fores t area	Land under non-agricultural use	Permanent Pastures and other grazing land	Cultivable wasteland	Land under misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows	Unclassif ied
	Area(000'ha)	224.6	24.5	110.2	5.1	19.8	14.0	24.6	6.3	1.9	1.5	16.7

* Source: District Statistical Diary, 2010, Bageshwar

1.4	Major Soils *	Area ('000 ha)	Percent (%) of total area
1	Medium deep to deep, loamy-skeletal soils moderate to severe erosion; *associated with*: Loamy soils with moderate erosion	-	-
2	Deep, loamy soils with moderate erosion and moderate stoniness; *associated with*: Medium, deep, loamy soils	-	-
3	Shallow, loamy-skeletal soils with severe erosion and strong stoniness; *associated with*: Rock outcrops	-	-
4	Medium deep to deep loamy soils with moderate to severe erosion	-	-
5	Shallow, loamy soils with severe erosion; *associated with*: severe erosion and strong stoniness	-	-
6	Shallow to medium deep, loamy soils with moderate to severe erosion and slight stoniness	-	-
7	Rock outcrops covered with glaciers; *associated with*: Shallow, sandy-skeletal soils with severe erosion and strong stoniness	-	-
8	Rock outcrops; *associated with*: Shallow, loamy-skeletal soils with severe erosion and moderate stoniness	-	-
9	Rock outcrops; *associated with*: Deep, loamy-skeletal soils with severe erosion and strong stoniness	-	-
10	Shallow, sandy soils with moderate erosion; *associated with*: Loamy soils	-	-
11	Deep, loamy-skeletal soils with severe erosion and slight to moderate stoniness; *associated with*: Loamy soils	-	-
12	Rock outcrops; *associated with*: Medium deep, loamy-skeletal, calcareous soils with severe erosion and strong stoniness	-	-
13	Deep, sandy soils with slight erosion and moderate flooding; *associated with*: Stratified loamy soils with moderate flooding	-	-
14	Shallow to medium shallow, loamy soils with severe erosion	-	-
15	Medium to deep, loamy, calcareous soils with slight erosion; *associated with*: Deep loamy-skeletal soils with moderate erosion and medium stoniness	-	-
	Total area	-	-

1.5	Agricultural land use	Area (‘000 ha)	Cropping intensity %
	Net sown area	24.5	173
	Area sown more than once	17.9	
	Gross cropped area	42.4	

*Source: *District Statistical Diary, 2010, Bageshwar

1.6	Irrigation	Area (‘000 ha) (Fill the cells if data are available or say Not applicable or not available)		
	Net irrigated area	5.866		
	Gross irrigated area	11.689		
	Rain fed area	12.765		
	Sources of Irrigation	**Number**	**Area (‘000 ha)**	**% age of total irrigated area**
	Canals	NA	5.043	86
	Tanks	1058	NA	
	Tube wells	NA	NA	
	Bore wells	NA		
	Other wells	NA		
	Lift irrigation schemes (Hy-drum)	87	NA	NA
	Micro-irrigation	NA		
	Other sources :		0.823	14
	Kuhls			
	Khatris (man-made water storage in rocky caves)	NA		
	Total Irrigated Area		5.866	
	Pump sets	18		
	No. of Tractors	NA		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	Not available		
	Critical	Not available		
	Semi- critical	Not available		
	Safe	Not available		Ground water is of good quality
	Wastewater availability and use	Not available		
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

*Source: *District Statistical Diary, 2010, Bageshwar

1.7 Area under major field crops & horticulture

Sl. No.	Major field crops cultivated	Total Area ('000 ha)	
1.	Wheat	5.7	
2.	Maize	0.4	
3.	Paddy	14.9	
4.	Barley	1.5	
5.	Finger millet	5.9	
6.	Pulses (Specify the prominent crop)		
	i. Lentil	1.0	
	ii. Urd	0.1	
	iii. Others	0.02	
6.	Oil seeds(Specify the prominent crop)		
	i. Mustard/ lahi	0.1	
	ii. Sesame	0.01	
	iii. Soya bean	0.1	
Horticultural			
		Total Area ('000 ha)	**% Area**
1.	Citrus	0.8	15.2
2.	Mango	0.5	9.7
3.	Pear	0.6	10.6
4.	Walnut	0.4	6.9
5.	Apple	0.2	3.9
6.	Peach	0.2	2.9
7.	Litchi	0.01	0.2
8.	Plum	0.1	1.9
9.	Apricot	0.2	3.3
10	Others	0.6	10.1
	Vegetables		
1.	Potato	0.5	9.8
2.	Others	1.4	25.7

* Source: District Statistical Diary, 2010, Bageshwar

1.8	Livestock	Number (as per Livestock census, 2003)
Sr. No.	Type of animals	
1	Crossbred cows	1,339
2	Local cows	1,19,782
3	Total Cattle	1,21,121
4	Buffaloes	42,250
5	Goats	81,105
6	Sheep	19,983
7	Pigs	72
8	Horse & mule	322
	Others	1405
	Total Livestock	2,66,258
1.9	Poultry	14,737

*District Statistical Diary, 2010, Bageshwar

1.10	Inland Fisheries *	Water Spread Area(sq. m)	Yield (q/100 m^2)	Production (q)
	i) Brackish water	Not applicable		
	ii) Fresh water (Ponds only)	17,000	60	78
	Total area estimated	Not available	Not available	Not available
	Fish species	Mahsheer, Common carp ,Silver carp, Grass carp, Snow trout, Singhara,		

*Fisheries Department, Bageshwar

1.11 Production and Productivity of major crops (Average) (Please give data only for five crops under each category given at 1.7 and it will be same for section 2.0 also)

Name of crop	*Kharif*		*Rabi*	
	Production ('000MT)	Productivity (kg/ha)	Production ('000MT)	Productivity (kg/ha)
Wheat	Not applicable		16.426	1033
Maize	0.519	1362	Not applicable	
Rice	20.439	1375	Not applicable	
Barley	Not applicable		1.546	1045
Finger millet	9.458	1609	Not applicable	
Fruits (Pl. specify the major crop)				
Mango			Not available	
Citrus	Not available			

Litchi			Not available
Guava			Not available
Peach			Not available
Papaya			Not applicable
Other fruits			Not available
Other Vegetables (Pl. specify the major crop)			
Tomato			Not applicable
Cucurbits			Not available
Bhindi			Not applicable
Onion	Not applicable		Not available
Cauliflower	Not applicable		Not available
Peas	Not applicable	Not applicable	
Potato		17760	Not applicable

1.12	Sowing window for 5 major field crops	Finger millet	Paddy	Wheat	Lentil	Barley
	***Kharif*- Rain fed**	20 May – 10 June	20 March- 10 April (Chetti) 20 May – 20 June (Jethi)	Not applicable		
	***Kharif*-Irrigated**	Not applicable	10 May- 20 May (Nursery) 15June – 30 June (Transplanting)	Not applicable		
	***Rabi*- Rain fed**	Not applicable		15 October to 20 November	15 to 30 October	20 October to 10 November
	***Rabi*-Irrigated**	Not applicable		20 October to 25 November	Not applicable	

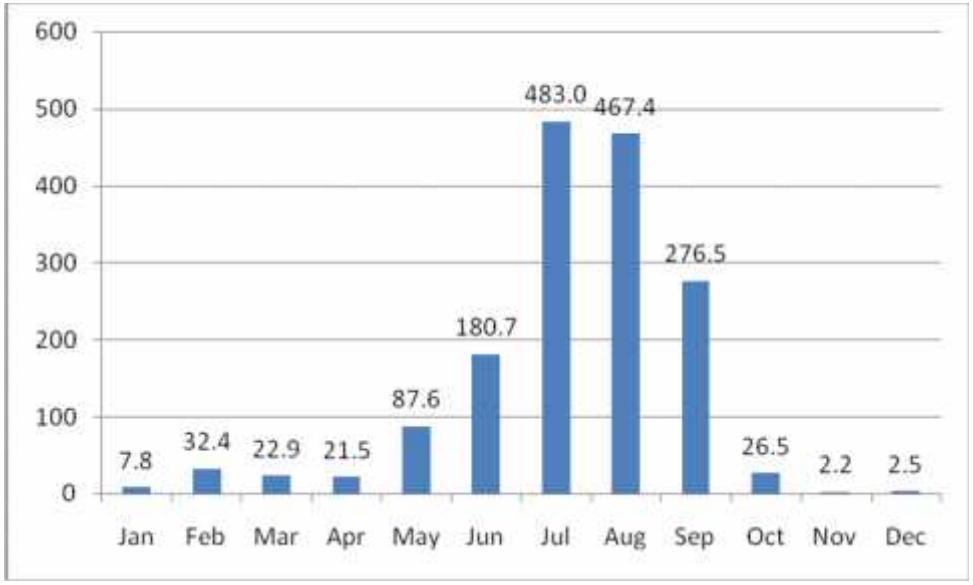
1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular (Means 6 out of 10 years)**	**Occasional (Means less than 6 years out of 10 years)**	**None**
	***Kharif* season**			
	Drought Please tick any one not both		✓ (May-June)	Not applicable
	Flood	Not applicable		
	Cyclone	Not applicable		
	Hail storm	Not applicable		
	Heat wave		✓ (May-June)	Not applicable
	Cold wave	Not applicable		

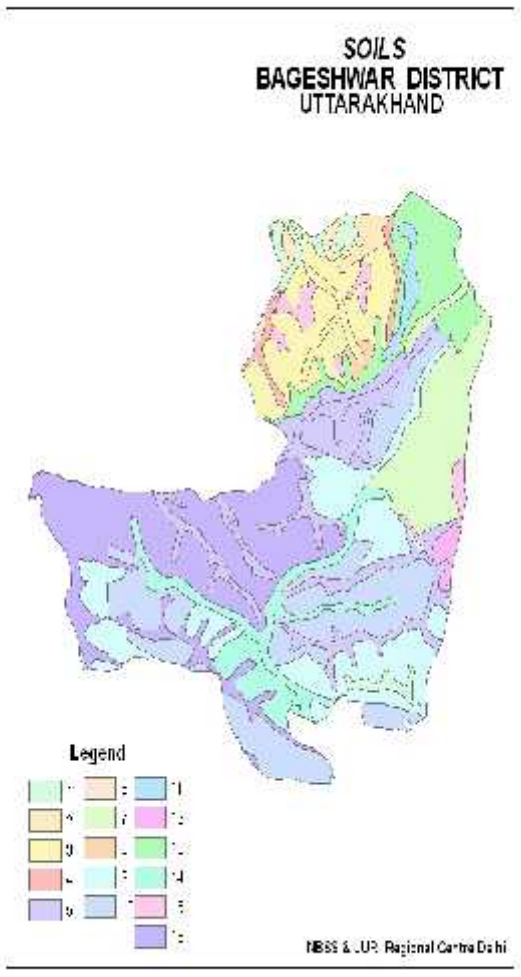
	Frost	Not applicable		
	Sea water intrusion	Not applicable		
	***Rabi* season**			
	Drought Please tick any one not both	✓ (Nov-Feb)		
	Flood	Not applicable		
	Cyclone	Not applicable		
	Hail storm	Not applicable	✓ (April-May)	Not applicable
	Heat wave			Not applicable
	Cold wave	✓ (Jan- Feb)	Not applicable	Not applicable
	Frost	✓ (Jan- Feb)	Not applicable	
	Sea water intrusion	Not applicable	Not applicable	
	Pests and disease outbreak (Borers, Fungal, Bacterial and Viral diseases) (Specify only those pest and diseases that are triggered due to unusual wet weather conditions)	Fruit fly of guava, mango, and cucurbits , rice leaf folder, leaf hopper and mealy bug in mango, peach leaf curl , mustard aphid, citrus nematode, nematodes in vegetables, brinjal fruit borer, tomato fruit borer , termite in rainfed crops sudden wilt and powdery mildew of cucurbits, yellow rust and loose smut of wheat, early blight and bacterial wilt of potato, false smut, blast and bacterial blight of rice, bacterial stalk rot of maize and bacterial wilt of capsicum, bacterial wilt and early blight of tomato, yellow mosaic virus and damping off of okra, citrus canker and red rust of litchi, powdery mildew and leaf minor of peas	Rice stem borer, rice hispa, wheat aphid, cabbage butter fly and maize stem borer, fruit borers and jassids of okra, aphids and white fly of cole crops, leaf sheath blight of maize, late blight of potato, covered smut of barley, alternaria blight and white rust of mustard, downy mildew of cucurbits, stalk rot of cole crops, bacterial wilt and phytophthora blight in solanaceous crops	Not applicable

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

Annexure 01 : Location map of the Uttarakhand state and district Bageshwar

Annexure 02 : Mean annual rainfall (mm) of district Bageshwar





Soils of Summits and Ridge Slopes

1. Glacier, associated with rock outcrops .

Soils on side slopes (>50% slope)

2. Rock outcrops associated with shallow, sandy skeletal soils, very severely eroded and strong stoniness.

Soils of Lesser Himalayas

Summits and Ridges (30-50% Slopes)

3. Shallow, sandy skeletal, severely eroded, and strong stoniness associated with loamy-skeletal soils, severely eroded and strong stoniness .
4. Shallow, loamy-skeletal soils, severely eroded and moderate stoniness associated with sandy skeletal soils, severely eroded and moderate stoniness .
5. Medium deep, loamy soils, moderately eroded and strong stoniness associated with loamy skeletal soils and moderately eroded .

Side Slopes (30-50%slopes)

6. Deep, loamy soils, moderately eroded and moderate stoniness associated with loamy skeletal soils, moderately eroded and moderate stoniness .
7. Shallow, loamy soils severely eroded and strong stoniness associated with medium deep loamy soils, moderately eroded and moderate stoniness..
8. Medium deep, loamy-skeletal soils, moderately eroded and strong stoniness associated with shallow loamy soils, moderately eroded and moderate stoniness .
9. Medium deep, loamy-skeletal soils, moderately eroded associated with shallow loamy soils, severely eroded .
10. Medium deep, loamy soils, moderately eroded and moderate stoniness associated with medium deep, loamy soils .
11. Deep loamy soils and slightly eroded associated with loamy-skeletal soils and moderately eroded .

Glacio-Fluvial Valley (3-5% slopes)

12. Medium deep, sandy skeletal soils, slightly eroded and strong stoniness associated with loamy soils, slightly eroded and strong stoniness .

Fluvial Valley (3-5% slopes)

13. Deep, loamy soils and slightly eroded, associated with sandy soils with strong stoniness .
14. Medium deep, loamy soils and moderately eroded associated with deep loamy soils.

Cliffs (>50% slopes)

15. Rock outcrops associated with shallow, loamy soils, very severely eroded and strong stoniness .**Shiwaliks**

Side Slopes (30-50% slopes)

16. Deep, loamy soils and slightly eroded associated with medium deep, loamy-skeletal soils and moderately eroded .

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**		
Early season drought (delayed onset)			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
Delay by 2 weeks **1st week of July**	Rainfed Mid hills (Sub humid-801-1800 m)	Rice (Chetti/Spring ,Jethi)	Chetti/Spring rice- (VL 207, VL 208, VL 209), Jethi -Use of short duration varieties (VL-154)	Increase seed rate, deep placement of seeds,application of proper doses of FYM (8-10 t/ha), mulching with available farm residue	Dept. of Agriculture, VPKAS and KVK
		Finger millet	Finger Millet (VL-146, VL-149, VL-315, VL- 324, VL-347)	Increase seed rate, deep placement of seeds,application of proper doses of FYM (6-8 t/ha), mulching with available farm residue	Dept. of Agriculture, VPKAS and KVK
		Maize	Maize (Vivek Maize Hybrid- 25, Vivek Maize Hybrid- 39, Vivek Maize Hybrid-21, Vivek Maize Hybrid- 33 Vivek Sankul Makka- 31, Vivek Sankul Makka- 35)	Increase seed rate, application of proper doses of FYM (8-10 t/ha), mulching with available farm residue	Dept. of Agriculture, VPKAS and KVK
	Rainfed High hills (Temperate 1801-2200 m)	Finger millet	Finger Millet (VL-146, VL-347)	Increase seed rate, application of proper doses of FYM (6-8 t/ha), mulching with available farm residue	Dept. of Agriculture, VPKAS and KVK
		Maize	Maize (Vivek Maize Hybrid- 25, Vivek Maize Hybrid- 39, Vivek Maize Hybrid-21, Vivek Maize Hybrid- 33 Vivek Sankul Makka- 31, Vivek Sankul	Increase seed rate, application of proper doses of FYM (8-10 t/ha), mulching with available farm residue, intercropping with soy bean/ rajmash/	Dept. of Agriculture, VPKAS and KVK

			Makka- 35)	horse gram	
	Very high hills (> 2200 m)	Finger & barnyard millets mixed with Amaranth/ Pulses	Buck Wheat (VL- Ugal- 7), Amaranth (VL- Chua-44), Rajma (VL- Rajma-63 & VL- Rajma- 125)	Increase seed rate, deep placement of seeds,application of proper doses of FYM (8-10 t/ha), mulching with available farm residue, intercropping with rajmash/ horse gram	Dept. of Agriculture, VPKAS and KVK

Condition	**Suggested contingency measures**				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks 3rd week of July	Rainfed Mid hills (Sub humid- 801-1800 m)	Rice (Chetti/ Spring ,Jethi)	Change of crop with Urd/ horse gram/ maize Selection of short duration varieties of catch crops: Horse gram (VL-Gahat-19) Urd (Pant Urd-19, Pant Urd-35) Maize(VL-Makka-35&VL-Makka-31)	Increase seed rate, application of proper doses of FYM (8-10 t/ha), mulching with available farm residue	MANREGA and taking up seed production and distribution in RKVY for these crops
		Finger millet	Change of crop with Urd/ horse gram/ maize/ Buchwheat/ Amranth or re-sowing with short duration varieties Selection of short duration varieties of catch crops: Horse gram (VL-Gahat-19) Urd(Pant Urd-19 & Pant Urd-35) Maize (Vivek Sankul Makka-35 & Vivek Sankul Makka-31) Buck Wheat (VL-Ugal-7) Amaranth (VL-Chua-44) Re-sowing with short duration varieties (VL- Mandua- 146, VL – Mandua -347)	Increase seed rate, application of proper doses of FYM (6-8 t/ha), mulching with available farm residue	MNREGA and taking up seed production and distribution in RKVY for these crops
		Maize	Change of crop with Urd/ horse gram or re-sowing with short duration varieties Use failed crop as fodder, Selection of short duration varieties of catch crops: Horse gram (VL-Gahat-19) Urd (Pant Urd-19 & Pant Urd-35) Or Re-sowing with short duration varieties of Maize (VL-Makka-35 & VL-Makka-31)	Increase seed rate, application of proper doses of FYM (8-10 t/ha), mulching with available farm residue	MNREGA and taking up seed production and distribution in RKVY for these crops
	Rainfed High hills (Temperate 1801-2200 m)	Finger millet	Change of crop with short duration horse gram/ maize/ amaranth/ buckwheat / garden pea/ radish Short duration Horse gram (VL-Gahat-19) and Maize(Vivek Sankul Makka-35 & Vivek Sankul Makka -31) Amaranth	Increase seed rate, application of proper doses of FYM (6-8 t/ha), mulching with available farm residue	MNREGA and taking up seed production and distribution in RKVY for these crops

			(VL- Chua-44), Buck Wheat (VL-Ugal-7), Garden pea- (Arkel), Radish- Doornagiri gol		
		Maize	Change of crop with short duration horse gram/ amaranth/ buckwheat / garden pea/ radish or Re-sowing with short duration varieties		MNREGA and taking up seed production and distribution in RKVY for these crops
	Very high hills (> 2200 m)	Finger & barnyard millets mixed with Amaranth/ Pulses	Change of crop with maize for green cob as well as fodder purpose/ radish vegetable pea, rai/ buckwheat Maize (Vivek Sankul Makka-35 & Vivek Sankul Makka-31), Fodder Maize (Jonsar babar, African tall, J-1006), Radish (Japanese white) Vegetable pea (Arkel, Vl-Matar-7) Rai (Hathi kan), Buckwheat- VL-Ugal-7	Increase seed rate, application of proper doses of FYM (8-10 t/ha), mulching with available farm residue, proper drainage	MNREGA and taking up seed production and distribution in RKVY for these crops

Condition	**Major Farming situation**	**Normal crop/cropping system**	**Suggested contingency measures**		
Early season drought (delayed onset) **Delay by 6 weeks** **2nd week of Aug**			**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
	Rainfed Mid hills (Sub humid- 801-1800 m)	Rice (Chetti/Spring ,Jethi)	Change of crop with maize for green cob as well as fodder purpose, green manure crop, radish, rai, buckwheat Maize (Vivek Sankul Makka-35, Vivek Sankul Makka-31), Fodder Maize(Jonsar babar, African tall, J-1006), Radish (Japanese white), Rai (Hathi kan), Buckwheat(VL-Ugal-7)	Plantation of multipurpose trees and perennial grasses, Increase seed rate, application of proper doses of FYM, mulching with available farm residue, proper drainage, incorporation of green manure crop at pre flowering stage, thinning of closely spaced plants, if any.	Plantation of multipurpose trees and perennial grasses under MANREGA and taking up seed production and distribution in RKVY for these crops
		Finger millet,			
		Maize			

	Rainfed High hills (Temperate 1801-2200 m)	Finger millet Maize	Change of crop with maize for green cob as well as fodder purpose, radish, Coriander, rai, vegetable pea, green manure crop. Maize(Vivek Sankul Makka-35 Vivek Sankul Makka-31), Fodder Maize(Jonsar babar, African tall, J-1006), Radish (Japanese white), Coriander (Pant Haritima), Rai(Hathi kan), Vegetable pea short duration varieties- Arkel, VL-Matar-7, Jowar (Pant chari-6)	Plantation of multipurpose trees and perennial grasses Increase seed rate, application of proper doses of FYM, mulching with available farm residue, proper drainage, incorporation of green manure crop at pre flowering stage, thinning of closely spaced plants, if any	
	Very high hills (> 2200 m)	Finger millets mixed with Amaranth/ Pulses	Change of crop with maize for fodder purpose, radish, Coriander, rai, vegetable pea, green manure crop, Maize(Vivek Sankul Makka-35, Vivek Sankul Makka-31), Fodder Maize (Jonsar babar, African tall, J-1006), Radish (Pusa Himani, Pusa Mridula) ,Coriander (Pant Haritima), Rai (Hathi kan), Vegetable pea short duration varieties- Arkel, VL-Matar-7, Jowar	Plantation of multipurpose trees and perennial grasses Increase seed rate, application of proper doses of FYM, mulching with available farm residue, proper drainage, , incorporation of green manure crop at pre flowering stage, thinning of closely spaced plants, if any	

Condition	**Major Farming situation**	**Normal crop/cropping system**	**Suggested contingency measures**		
Early season drought (delayed onset)			**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks **4th week of Aug**	Rainfed Mid hills (Sub humid- 801-1800 m)	Rice (Chetti/ Spring ,Jethi) Finger millet	Change of crop with Radish, Coriander, Rai, Green fodder (Maize, Jowar, Cowpea, green manure crop), Radish (Japanese white), Coriander (Pant Haritima), Rai (Hathikan), Fodder	Plantation of multipurpose trees and perennial grasses, Proper drainage, incorporation of green manure crop at pre flowering stage, thinning of closely spaced plants, if any	Plantation of multipurpose trees

		Maize	Maize (African tall, J-1006), Jowar (Pant Chari-6), Cowpea (UPC-5286, 625)		and perennial grasses under MANREGA , Seed supply through HMNEHS and RKVY
	Rainfed High hills (Temperate 1801-2200 m)	Finger millet	Change of crop with maize for fodder purpose, radish, Coriander, rai, vegetable pea, Jowar (fodder), green manure crop. Radish (Pusa Himani, Pusa Mridula), Coriander (Pant Haritima), Rai (Hathikan), Vegetable Pea (Arkel, VL-Matar-7), Fodder Maize (African tall, J-1006), Jowar (Pant Chari-6)	Plantation of multipurpose trees and perennial grasses, Proper drainage, incorporation of green manure crop at pre flowering stage, thinning of closely spaced plants, if any	
		Maize			
	Very high hills (> 2200 m)	Finger millets mixed with Amaranth/ Pulses	Change of crop with maize for fodder purpose, radish, Coriander, rai, Jowar (fodder), green manure crop. Fodder Maize (African tall, J-1006), Radish (Pusa Himani, Pusa Mridula), Coriander (Pant Haritima), Rai (Hathi Kan) Jowar (Pant Chari-6)	Plantation of multipurpose trees and perennial grasses, Increase seed rate, application of proper doses of FYM, mulching with available farm residue, proper drainage, incorporation of green manure crop at pre flowering stage, thinning of closely spaced plants, if any	

Condition	**Suggested contingency measures**				
Early season drought (Normal onset June 3rd wk)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell	Rainfed Mid hills (Sub humid- 801-1800 m)	Rice (Cheti/Spring ,Jaithi)	No change in Cheti but Gap filling if more than 75% germination otherwise replanting in Jaithi	Spray of NPK solution orTop N dress recommendation of rainfed crop coinciding with rain splashes; rain water harvesting of surrounding,	Dept. of Agriculture and

after sowing leading to poor germination/crop stand etc.		Finger millet	Gap filling if more than 75% germination otherwise replanting	mulching with available farm residue, fields, keep the crop weeds free	KVK for awareness of nutrient application, construction of rain water harvesting structures under MNREGA
		Maize	Gap filling if population is >50% otherwise re sowing with 10% more seed rate		
	Rainfed High hills (Temperate 1801-2200 m)	Finger millet	Gap filling if more than 75% germination otherwise replanting	Spray of NPK solution or Top N dress recommendation of rainfed crop coinciding with rain splashes; rain water harvesting of surrounding, mulching with available farm residue, fields, keep the crop weeds free	
		Maize	Gap filling if population is >50% otherwise re sowing with 10% more seed rate		
	Very high hills (> 2200 m)	Finger millets mixed with Amaranth/ Pulses	Gap filling or re-sowing	Spray of NPK solution or Top N dress recommendation of rainfed crop coinciding with rain splashes; rain water harvesting of surrounding, mulching with available farm residue, fields, keep the crop weeds free	

Condition	**Suggested contingency measures**				
Early season drought (Normal onset June 3rd wk)	**Major farming situation[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measure[s]**	**Remarks on implementation[e]**
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) **At vegetative stage**	Rainfed Mid hills (Sub humid- 801-1800 m)	Rice (Chetti/Spring ,Jethi)	Life saving irrigation if available, Removal of less vigorous plants up to 20% and use as fodder. Removal of cobless plants in maize and use as fodder, use failed legume crop as fodder	Foliar N management (1% urea spray) instead of top N dress; Efficient weed management and their *in-situ* mulching, Use local available plant material for mulch, bunding, soil mulching with wheel hand hoe.	Dept. of Agriculture and KVK for awareness of nutrient application, construction of rain water harvesting structures under MNREGA as a long term drought proofing measure
		Finger millet			
		Maize			
	Rainfed High hills Temperate 1801-2200 m)	Finger millet			
		Maize			
	Very high hills	Finger millets mixed with			

	(> 2200 m)	Amaranth/ Pulses			
Condition	**Suggested contingency measures**				
Early season drought (Normal onset) **At reproductive stage and terminal stage**	**Major farming situation[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measure[s]**	**Remarks on implementation[e]**
	Rainfed Mid hills (Sub humid- 801-1800 m)	Rice (Cheti/Spring ,Jaithi) Finger millet Maize	Site-specific crop management technologies: • If crop stand is poor then use of crop as fodder. • Thinning • life saving irrigation from rain water harvest ponds • Weeding and Weed mulching • Anti-transpirant spray • Salicylic acid spray to induce early maturity • Harvesting at physiological maturity • Harvest whatever crop is available and immediately conserve the soil moisture for *Rabi* crops • If rain comes Toria sowing in mid September • If crop stand is poor then use of crop as fodder sowing of Radish/Peas/Rai as catch crop followed by Wheat OR in areas where drought is expected quite often then go for early wheat varieties viz., VL616/VL829	Foliar N management (1 % urea spray) instead of Top N dress only if the crop stand is still better, , Use local available plant material for mulch.	Dept. of Agriculture and KVK for awareness of nutrient application, construction of rain water harvesting structures under MNREGA as a long term drought proofing measure
	Rainfed High hills (Temperate 1801-2200 m)	Finger millet	Site-specific crop management technologies: • Life saving irrigation, if available • Anti-transpirant spray • Salicylic acid spray to induce earliness • If grain setting has occurred in maize,	Foliar N management (1 % urea spray) instead of top N dress; Efficient weed management and their *in-situ* mulching, Use	Dept. of Agriculture and KVK for awareness of nutrient application, construction of rain water harvesting

		Maize	detasseling can be done to reduce transpiration • Harvesting at physiological maturity • Harvest whatever crop is available and immediately conserve the soil moisture for *Rabi* crops • If crop stand is poor then use of crop as fodder and sowing of Radish/Peas/Rai as catch crop followed by Wheat OR in areas where drought is expected quite often then go for early wheat varieties viz., VL616/VL829	local available plant material for mulch	structures under MNREGA as a long term drought proofing measure
	Very high hills (> 2200 m)	Finger millets mixed with Amaranth/ Pulses	Site-specific crop management technologies: • Life saving irrigation, if available • Anti-transpirant spray • Salicylic acid spray to induce earliness • Harvesting at physiological maturity • If crop stand is poor then use of crop as fodder and sowing of Radish/Peas/Rai as catch crop followed by Wheat VL-832	Foliar N management (1 % urea spray) instead of top N dress; Efficient weed management and their *in-situ* mulching, Use local available plant material for mulch	Dept. of Agriculture and KVK for awareness of nutrient application, construction of rain water harvesting structures under MNREGA as a long term drought proofing measure

2.1.2 Rain fed situation (*Rabi* season)

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 2 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
1st week of January (Normal onset 20th	Rainfed Mid hills (Sub humid- 801-	Wheat	If plant population is very poor resowing with Late sown wheat (VL-892, HS-420, HPW-42), intercropping with field pea	Increase seed rate, deep placement of seeds, addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	KVK for awareness and Dept. of

December ± 31 days	1800 m)	Barley	Nil	Increase seed rate, deep placement of seeds, addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	Agriculture for seed supply, construction of rain water harvesting structures under MNREGA
		Lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Rainfed High hills (Temperate 1801-2200 m)	Wheat	Intercropping with field pea	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	KVK for awareness and Dept. of Agriculture for seed supply, construction of rain water harvesting structures under MNREGA
		Barley	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
		Lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Very high hills(> 2200 m)	Wheat mixed with barley and lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha	-

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 4 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
3rd week of January (Normal onset 20th	Rainfed Mid hills (Sub humid- 801-	Wheat	Intercropping with field pea	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	KVK for awareness and Dept. of

December ± 31 days	1800 m)	Barley	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	Agriculture for seed supply, construction of rain water harvesting structures under MNREGA
		Lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Rainfed High hills (Temperate 1801-2200 m)	Wheat	Intercropping with field pea	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	KVK for awareness and Dept. of Agriculture for seed supply, construction of rain water harvesting structures under MNREGA
		Barley	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
		Lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Very high hills (> 2200 m)	Wheat mixed with barley and lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	-

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 6 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
1st week of February (Normal onset 20th	Rainfed Mid hills (Sub humid- 801-	Wheat	Change of crop if poor plant population Potato (Kufri Jyoti), green coriander, Spinach	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials,	KVK for awareness and Dept. of Agriculture for seed

December ± 31 days	1800 m)	Barley	Change of crop if poor plant population Potato (Kufri Jyoti), green coriander, Spinach	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	supply, construction of rain water harvesting structures under MNREGA
		Lentil	Change of crop if poor plant population Potato (Kufri Jyoti), green coriander, Spinach	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Rainfed High hills (Temperate 1801-2200 m)	Wheat	Intercropping with field pea	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	KVK for awareness and Dept. of Agriculture for seed supply, construction of rain water harvesting structures under MNREGA
		Barley	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
		Lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Very high hills (> 2200 m)	Wheat mixed with barley and lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	-

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 8 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
3rd week of Februrary **(Normal onset 20th**	Rainfed Mid hills (Sub humid- 801-	Wheat	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	KVK for awareness and Dept. of Agriculture for seed

December ± 31 days	1800 m)	Barley	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, construction of rain water harvesting structures under MNREGA
		Lentil	Change of crop Potato (Kufri Jyoti), green coriander, Spinach	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Rainfed High hills (Temperate 1801-2200 m)	Wheat	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	KVK for awareness and Dept. of Agriculture for seed supply, construction of rain water harvesting structures under MNREGA
		Barley	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	
		Lentil	Potato (Kufri Jyoti), green coriander, Spinach	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Very high hills (> 2200 m)	Wheat mixed with barley and lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	-

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Early season drought (Normal onset 20th December)			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
	Rainfed Mid	Wheat	Intercropping with field pea, Late sown	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture	-Nil-

followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	hills (Sub humid- 801-1800 m)		wheat (VL892, HS-420, HPW-42)	conservation measures with locally available mulch materials	
		Barley	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Rainfed High hills (Temperate 1801-2200 m)	Wheat	Intercropping with field pea, Late sown wheat (VL892, HS-420, HPW-42)	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	-Nil-
		Barley	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials, Site-specific crop management technologies	
		Lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Very high hills (> 2200 m)	Wheat mixed with barley and lentil	Nil	Increase seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	-

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
			Change in crop/ cropping system	**Agronomic measure**	**Remarks on implementation**
Under Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) **At vegetative stage**	Rainfed Mid hills (Sub humid- 801-1800 m)	Wheat Barley Lentil	Site-specific crop management technologies: • Life saving irrigation, if available • Anti-transpirant spray • Salicylic acid spray to induce earliness • Harvesting at physiological maturity	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials, construction of water harvesting and moisture conservation structure.	Construction of water harvesting and moisture conservation structure MNREGA.
	Mid hills south aspect	Wheat Barley Lentil	Site-specific crop management technologies: • Life saving irrigation, if available • Anti-transpirant spray • Salicylic acid spray to induce earliness • Harvesting at physiological maturity	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials, construction of water harvesting and moisture conservation structure.	
	Very high hills (> 2200 m)	Wheat mixed with barley and lentil	No change	-	-

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 weeks Early season drought (delayed onset) **Delay by 2 weeks Normal onset on 20th June ±10 days** **1st week of July (sowing is done generally by**	Irrigated Mid hills and valleys (Sub humid-	Rice	Rice (VL-Dhan- 81, VL-Dhan- 82, VL-Dhan-85)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, bunding	Supply of seeds through Dept. of Agriculture and KVK for awareness

20th of June with pre monsoon showers)	801-1800 m)			irrigate field before soil cracking,	

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 4 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
3rd week of July	Irrigated Mid hills and valleys (Sub humid-801-1800 m)	Rice	Rice (VL-Dhan- 81, VL-Dhan- 82, VL-Dhan-85)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, bunding, irrigate field before soil cracking	Supply of seeds through Dept. of Agriculture and KVK for awareness

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 6 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
1st week of August	Irrigated Mid hills and valleys (Sub humid-801-1800 m)	Rice	Rice (VL-Dhan- 81, VL-Dhan-82, VL-Dhan-85)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, bunding , irrigate field before soil cracking	Supply of seeds through Dept. of Agriculture and KVK for awareness

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
Delay by 8 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
3rd week of August	Irrigated Mid hills and valleys (Sub humid- 01-1800 m)	Rice	Rice (VL-Dhan- 81, VL-Dhan- 82, VL-Dhan-85)	Foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, bunding, irrigate field before soil cracking	Supply of seeds through Dept. of Agriculture and KVK for awareness

2.1.4 Irrigated situation (Rabi Season)

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
Delay by 2 weeks Early season drought (delayed onset)			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
Delay by 2 weeks Normal onset on 20th December ±10 days **1st week of January**	Irrigated Mid hills and valleys (Sub humid- 801-1800 m)	Wheat	VL-892, HS-420, HPW-42 if sowing delayed	Increase seed rate, one pre sowing irrigation , if available, prefer deep sowing with minimum soil load on seed under low moisture in seed zone condition, keep the crop weed free, addition of organic manures (FYM/compost) @ 5-10 t/ha, if single irrigation apply at CRI	-

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
Delay by 4 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
3rd week of January	Irrigated Mid hills and valleys (Sub humid 801-1800 m)	Wheat	Nil	Increase seed rate, keep the crop weed free, addition of organic manures (FYM/compost) @ 5-10 t/ha, if single irrigation apply at CRI	Supply of seeds & nutrient through Dept. of Agriculture and KVK for awareness

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
Delay by 6 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
1st week of February	Irrigated Mid hills and valleys (Sub humid-801-1800 m)	Wheat	Nil	Keep the crop weed free, foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, if two irrigation apply at CRI and flowering	-

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested contingency measure		
Delay by 8 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
3rd week of February	Irrigated Mid hills and valleys (Sub humid-801-1800 m)	Wheat	Nil	Keep the crop weed free, foliar N management (1% NPK spray), addition of organic manures (FYM/compost) @ 5-10 t/ha, if three irrigation apply at CRI, flowering and milking	-Nil-

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

Condition	Suggested contingency measures				
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Not applicable				

Condition	Suggested contingency measures				
	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				

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Rice	Strengthening of field bundings, In water logged condition make 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	Make open drainage channels across the field	Drain out excess water through drainage channel	Grain harvesting from standing crop, drain out excess water, Harvesting at physiological maturity	Proper drying and storage of grains
Maize	Make 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	Make open drainage channels across the field	Drain out excess water through drainage channel	Not applicable	Not applicable
Horticulture				
Apple, Pear, Peach, Plum	Remove water from basin by making drainage	Remove water from basin by making drainage, use bee hives for proper pollination.	Remove water from basin by making drainage, use early varieties	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, staking	Harvesting at proper stage	Storage and immediate transportation to market
Heavy rainfall with high speed winds in a short span[2]				
Rice, Maize, Finger-millet,	In water logged	Drain out excess water	Drain out excess water	Storage at safer warehouse, Proper drying and storage

Black Soybean	condition, make open drains across the field	through drainage channel	Harvesting at physiological maturity	of grains
Horticulture				
Pome Fruits (Apple& Pear)	• Complete drainage, Channelization of excess water • Earthing up around the trunk • Soil working to improve soil aeration and control weeds • Apply 40-50 kg FYM/ tree or recommended nutrients	• Complete drainage, Channelization of excess water • Earthing up around the trunk • Soil working to improve soil aeration and control weeds • Apply 40-50 kg FYM/ tree or recommended nutrients • Hormonal or multinutrient spray for promoting flowering /fruit set. • Monitore bee population and further strengthen if required. • Use supplement pollination techniques to improve pollination and fruit set.	• Complete drainage, Channelization of excess water • Till the soil within the basin to improve soil aeration and control weeds • Apply 40-50 kg FYM/ tree or recommended nutrients	• Complete drainage, Channelization of excess water • Harvest the fruit on clear sunny day • Proper storage and immediate transportation to market/godown
Other Temperate Fruits (Stone Fruit)	• Complete drainage, Channelization of excess water • Earthing up around the trunk • Soil working to improve soil aeration and to control weeds • Apply 40-50 kg FYM/	• Complete drainage, Channelization of excess water • Earthing up around the trunk • Soil working to improve soil aeration and to control weeds • Apply 40-50 kg FYM/	• Complete drainage, Channelization of excess water • Till the soil within the basin to improve soil aeration and to control weeds • Apply 40-50 kg FYM/ tree or recommended	• Complete drainage, Channelization of excess water • Harvest the fruit on clear sunny day

	tree or recommended nutrients	tree or recommended nutrients • Hormonal or multinutrient spray for promoting flowering /fruit set. • Monitore bee population and further strengthen if required. • Use supplement pollination techniques to improve pollination and fruit set.	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	• Complete drainage, Channelization of excess water • Earthing up around the trunk • Till the soil to improve soil aeration and to control weeds • Apply 40-50 kg FYM/ tree or recommended nutrients	• Complete drainage, Channelization of excess water • Earthing up around the trunk • Till the soil to improve soil aeration and to control weeds • Apply 40-50 kg FYM/ tree or recommended nutrients • Hormonal or multinutrient spray for promoting flowering /fruit set. • Use supplement pollination techniques to improve pollination and fruit set.	• Complete drainage, Channelization of excess water • Apply 40-50 kg FYM/ tree or recommended nutrients	• Complete drainage, Channelization of excess water • Harvest the fruit on clear sunny day

Vegetables (Pea, Tomato, Cucurbits)	Proper Staking/Drainage	Staking	Field drainage	Storage and immediate transportation to market
Outbreak of pests and diseases due to unseasonal rains				
Rice and Finger millet	**<u>Brown plant hopper</u>** 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 **<u>Stem Borer</u>**: Prolonged moist and humid condition leads to outbreak. Spray Cartap hydrochloride 25 kg/ha	**<u>Brown plant hopper</u>** 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. **<u>Blast:</u>** Spray after observing initial infection of the disease, Carbendazim @ 1 g/l.	**<u>Stem Borer</u>**: Prolonged moist and humid condition leads to outbreak. Spray Cartap hydrochloride 25 kg/ha **<u>False smut in fingermillet and rice</u>**: Spray cuprous hydroxide 0.25 %	Not applicable
Maize	Proper Drainage	Top N dress after rain spells	Field drainage	Not applicable
Veg. Pea & Capsicum	Wilt in low lying water logged patches: Drench Carbendazim 1.0 g/l at the base of plants	**<u>Root rot</u>**: Soil drenching with carbendazim 0.1 %, **<u>Powdery mildew</u>**: Spray Sulphex 2.0 g/l		
Horticulture				
Apple	**<u>Apple scab</u> :** Follow the recommended schedule for the control of Apple scab **<u>White root rot</u>** : Drain out excess water from the basin and drench the basin with Carbendazim 200g, or copper oxy chloride 300 g / 200 l water (3-4 time at an interval of 15-20 days)	**<u>Apple scab</u> :** Follow the recommended schedule for the control of Apple scab **<u>White root rot</u>** : Drain out excess water from the basin and drench the basin with Carbendazim 100g, or copper oxy chloride 300 g / 200 l water (3-4 time at an interval of 15-20 days)	**<u>Premature leaf Fall</u>**: Follow the recommended spray schedule	Proper storage and immediate transportation to market/godown

Early Veg Pea and Capsicum	**Wilt** in low lying water logged patches: Drench Carbendazim 1.0 g/l at the base of plants	**Root rot**: Soil drenching with carbendazim 1.0 g/l **Powdery mildew**: Spray Sulphex 2 g/l	Field drainage	

2.2.6 Unusual rains (untimely, unseasonal etc) (for both Rain fed and irrigated situations) **Rabi season**

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
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
Horticulture				
Vegetable Pea	Drainage/IPM	Integrated Pest Management	Field drainage	Storage and immediate transportation to market
Potato	Drainage/IPM	Integrated Pest Management	Field drainage	Storage and immediate transportation to market
Cole crops	Drainage/IPM	Integrated Pest Management	Field drainage	Storage and immediate transportation to market
Heavy rainfall with high speed winds in a short span[2]				
Wheat	Drainage	Top N dress after rain spells	Field drainage	Proper drying before storage
Lentil	Drainage	Top N dress after rain spells	Field drainage	Proper drying before storage, apply coating of mustard oil before storage
Horticulture				
Pea	Staking/Drainage	Staking	Field drainage	Storage and immediate transportation to market
Potato	Drainage	Not applicable	Field drainage	Storage and immediate transportation to market
Cole crops	Drainage	Not applicable	Field drainage	Storage and immediate transportation to market
Outbreak of pests and diseases due to unseasonal rains				
Wheat	Apply Propiconazol (Tilt) if incidence of yellow rust appear	Apply Propiconazol (Tilt) if incidence of yellow rust appear	Field drainage	
Lentil	Drainage	Top N dress after rain spells	Field drainage	
Horticulture				
Pea	Apply Sulphex 2 g/l against powery mildew	Apply Sulphex 2 g/l against powery mildew	Field drainage	Storage and immediate transportation to market
Potato	Apply Dithan M-45 2g/l	Apply Sulphex 2 g/l	Field drainage	Storage and immediate transportation to market

	against blight	against powery mildew		
Cole crops	Apply Indoxacarb against caterpillars	-	-	Storage and immediate transportation to market

2.3 Floods

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

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

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

Frost		
Wheat	Same measures are followed as in case of cold wave	
Mustard	Same measures are followed as in case of cold wave	
Horticulture		
Mango	Same measures are followed as in case of cold wave	
Litchi	Same measures are followed as in case of cold wave	
Cyclone	Not applicable	
Horticulture	Not applicable	

3. Contingent strategies for Livestock, Poultry & Fisheries Livestock (Additional materials will be provided by CRIDA to improve this section. Select suitable one which are applicable to your situation)

Livestock	**Suggested contingency measures**		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	Increasing area under fodder crops; collect crop residues, collect tree fodder, use mangers, use chaff cutters , grass preservation in the form of hay and silage	Utilization of fodder from perennial & reserve sources, open grazing in forests and alpine slopes/ community lands and feeding of crop residues; use of mangers and chaff cutters , feeding of household waste, utilization of compact feed block	Availing Insurance, culling undesirable livestock ; raising of fodder trees, replacement of unproductive animals with improved ones, planning to increase fodder production
Drinking water	Use of ground water resource, maintain the storage of water in tanks , traditional water ponds , rivers	Utilization of stored water, stall drinking, rivers , traditional water ponds, reduce water wastage by using adequate amount of water for bathing of animal and cleaning of premises	Rejuvenation of water sources, bleach drinking water source
Health and disease management	Advance preparation with medicines and vaccination, local ethno pharmaceutical and modern medicines, in addition antimicrobial/ antibiotic sensitivity profiling of all the common bacterial pathogen causing significant disease syndrome should be known, procure multivitamins and area specific mineral mixture, refresher trainings to Veterinary Officers and Pharmacists	-Carry out deworming to all animals, tick control, quarantine sick animals, ring vaccination (in 5km radius), restrict movement of livestock in case of epidemic, daily lifting of dung and proper cleaning of shelters -Treatment of all affected livestock by mass campaign, modern veterinary care, veterinary camps , isolation, appropriate antibiotics /treatments could be instituted	Proper veterinary care , awareness, capacity building of locals, health care and management, surveillance on disease outbreak, vaccination, keep animal house clean and spray disinfectant, advise to framers for breeding milch animals during August to October (with adequate fodder supply and favorable weather conditions) in order to avoid the peak milk production during mid summer

Floods			
Feed and fodder availability	Not applicable		
Drinking water		Not applicable	
Health and disease management		Not applicable	
Cyclone			
Feed and fodder availability	Not applicable		
Drinking water	Not applicable		
Health and disease management	Not applicable		
Cold wave			
Shelter/environment management	With setting of winter bring the livestock back from high hill pasture lands to nearby pastures; restrict open grazing during cold wave	Stationary conditions and feeding in cowsheds, group living, dry grass flooring, gunny bags on windows, gunny bags wrapped on the belly of milking animals, restrict to open grazing during sunny days only	Open grazing in sunny days, massage of milking animals and other species, hot water bath of animals
Health and disease management	Feed traditional herbs to animals Use immune modulators	Provide warm living conditions, feed roasted *chanjh (*curd juice) to animals, avoid exposure to cold and rains/ snow, give multivitamins	Open grazing in sunny days and feeding of medicinal herbs. In case of acute problem contact local veterinarian

2.5.1 Poultry

Poultry	**Suggested contingency measures**		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Establishment of feed reserve bank and storage of feed at the farm	Supply of feed from the adjoining areas through Departmental interventions	Availing Insurance, Promotion of feed resources
Drinking water	Not a major problem, through construction of small rain harvesting storage structures in water scarce areas	Supply of water through Departmental interventions sanitation of drinking water	Construction of small rain harvesting storage structures for contingent plans, give adequate water as per requirement
Health and disease management	Surveillance and management by Department of Animal Husbandry, culling sick birds, de-worming and vaccination against infectious /contagious diseases	Surveillance and management by Department of Animal Husbandry, mixing Vit A,D,E,K and B complex in water	Surveillance and management by Department of Animal Husbandry. Hygiene and sanitation of poultry house, disposal of dead birds by burying

	.		
Floods	Not applicable		
Shortage of feed ingredients	Not applicable		
Drinking water	Not applicable		
Health and disease management	Not applicable		
Cyclone	Not applicable		
Shortage of feed ingredients	Not applicable		
Drinking water	Not applicable		
Health and disease management	Not applicable		
Heat wave and cold wave	Not applicable		
Shelter/environment management	Adequate ventilation during day and night in summer and adequate protection from extreme cold is exercised during winter		
Health and disease management	Not available		

2.5.3 Fisheries

Fisheries	**Suggested contingency measures**		
	Before the event	**During the event**	**After the event**
Drought			
Shallow water in ponds due to insufficient rains/inflows	Water harvesting structures with rain water impounding from catchment areas	Impounding of water through interventions of Department of Fisheries to save fish germplasm	Water harvesting structures with rain water impounding from catchment areas; watershed development planning and implementations.
Impact of heat and salt load build up in ponds / change in water quality	Not applicable		
Floods	Not applicable		
Heat wave and cold wave	Not applicable		