State: UTTARAKHAND
Agriculture Contingency Plan for District: UTTARKASHI

1.0	**District Agriculture profile**			
1.1	Agro-Climatic/Ecological Zone	Western Himalayan Region (09)		
	Agro-Climatic Region (Planning Commission)	Western Himalayan Region (01)		
	Agro Climatic Zone (NARP)	AZ Hill Zone		
	List all the districts falling under the NARP Zone (*>50% area falling in the zone)	U.S.Nagar, Haridwar, Nainital, Almora, Bageshwar, Champawat, Pithoragarh, Pauri, Tehari, Uttarkashi, Dehradun, Chamoli, Rudraprayag		
	Geographic coordinates of district headquarter	Latitude	Longitude	Altitude (a.m.s.l.)
		30.73N	78.45E	1140
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	• VPKAS (ICAR), Almora- 263601 (Uttarakhand) • UHFUttarkhand University of Horticulture and Forestry Ranichauri, Tehrigarhwal (Uttarakhand) • CSWCRTI (ICAR) Dehradun (Uttarakhand) • IVRI (ICAR), Mukteshwar, Nainital- (Uttarakhand) • CITH (ICAR) Mukteshwar, Nainital- (Uttarakhand) • GBPIHED (MoEF), Kosi- Katarmal, Almora (Uttarakhand)		
	Mention the KVK located in the district with address (This information available in ICAR phone directory which is available on ICAR website and please see under KVKs left hand side)	Krishi Vigyan Kendra (ICAR), Chinyalisaur 249196 distt. Uttarkashi Phone- 01371237198 Dr. V. K. Sachan, Programme Co-ordinator (94) Emal-kvkchinyalisaur@gmail.com, sachanvk@sify.com, vksachanji@gmail.com		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Dr. R. K. Singh, Agrometrologist, UHF, Ranichauri, Tehri Garhwal		

Source: Agriculture department Uttarakhand

1.2	Rainfall (2006-2011)	Average (mm)	Normal onset	Normal cessation
	SW monsoon (June-Sep)	890.7	June last week	Sept. last week
	NE monsoon (Oct-Dec)	38.5	Nov 2nd week	Dec. 2nd week
	Winter (Jan-Feb)	93.8	Jan 2nd week	March 1st week
	Summer (March-May)	152.2	April 2nd week	April 4th week
	Annual	1175.2	-	-

1.3 Land use pattern of the district (latest statistics) Area ('000 ha)									
Geographical Area	**Cultivable area (Give net cultivable area)**	**Forest 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**
812.4	30.8	703.5	5.2	8.3	2.3	4.4	37.6	0.6	1.6

*Statistical report 2007, District Agriculture Plan,

1.4	Major Soils *	Area ('000 ha)	Percent (%) of total area
1	Medium deep, loamy-skeletal soils, moderately eroded and moderate stoniness associated with deep loamy soils.		
2	Medium deep, loamy soils and moderately eroded associated with deep loamy soils.		
3	Medium deep, loamy soils moderately eroded and strong stoniness associated with loamy skeletal soils and moderately eroded.		
4	Medium deep, loamy-skeletal soils, moderately eroded and strong stoniness associated with shallow loamy soils, moderately eroded and moderate stoniness.		
5	Deep, sandy soils with moderate flooding associated with stratified loamy soils with slight flooding.		
6	Medium deep, loamy soils, moderately eroded and moderate stoniness associated with medium deep, loamy soils.		

7	Deep loamy soils and slightly eroded associated with loamy-skeletal soils and moderately eroded.		
8	Medium deep, loamy-skeletal soils moderately eroded associated with shallow loamy soils, severely eroded.		
9	Medium deep, loamy soils, moderately eroded, and moderate stoniness associated with shallow loamy-skeletal soils, moderately eroded and moderate stoniness.		
10	Deep, loamy soils and slightly eroded associated with medium deep, loamy-skeletal soils and moderately eroded.		
	Total area	30.819	

* Mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc.) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP, estimated values)

1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	30.8	170
	Area sown more than once	16.7	
	Gross cropped area	47.5	

*Source: Statistical hand book, Uttarkashi 2007

1.6	**Irrigation**	**Area ('000 ha)** (Fill the cells if data are available or say Not applicable or not available)		
	Net cultivated area	30.8		
	Net irrigated area	5.0		
	Gross cultivated area	47.8		
	Gross irrigated area	9.3		
	Gross rainfed area	38.5		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**Percentage of total irrigated area**
	Canal	-	3112	62.6
	Other sources	-	1862	37.4

*Source: Statistical hand book, Uttarkashi 2007

1.7 Area under major field crops & horticulture (Select five crops, each with at least 20% or more area under that category and contingency plan may be given for these crops)

S.No.	Major field crops cultivated	Total Area ('000 ha)	% Area
A.	**Cereal crops**		
1.	Paddy	10.2	24.5
2.	Wheat	13.4	32.2
3.	Finger millet	7.0	16.9
4.	Barnyard millet	2.8	6.8
5.	Maize	0.7	1.6
B.	**Pulse and oil seed crops**		
1.	Pea	0.5	5.6
2.	Black gram	0.7	3.0
3.	Red gram	0.5	1.5
4.	Lentil	0.4	1.9
5.	Mustard	1.7	8.3
Horticultural crops			
1.	Apple	6.9	56.9
2.	Pear	1.4	11.2
3.	Walnut	1.2	10.0
4.	Plum	0.7	5.6
5.	Citrus	0.2	1.6
Vegetable crops			
1.	Potato	1.9	41.3
2.	Vegetable pea	0.6	12.9
3.	Tomato	0.3	6.6
4.	French bean	0.2	3.7
5.	Cabbage	0.1	1.7

*Source: Statistical hand book, Uttarkashi 2007

1.8	Livestock	Population
Sr. No.	Type of animals	
1.	Indigenous cattle	95708
2.	Crossbred cattle	11119
3.	Buffalo	38690
4.	Indigenous sheep	101268
5.	Crossbred sheep	53131
6.	Goat	61970
7.	Pig	480
8.	Equine	6144

*Source: Statistical hand book, Uttarkashi 2007

1.9	Poultry	Population
Sr. No.	Type of Poultry	
1.	Desi	6762
2.	Hens	14234
3.	Improved	3133

*Source: Statistical hand book, Uttarkashi 2007

1.10	Inland Fisheries *	Area	Production
1.	River	244km	32.184 Mt
2.	Lakes	8.0 ha	
3.	Ponds	2056 ha	

*Source: Statistical hand book, Uttarkashi 2007

1.11 Production and Productivity of major crops (Average of last 5 years: 2004-2009) (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 (T)	**Productivity (kg/ha)**	**Production ('000MT)**	**Productivity (kg/ha)**
A.Cereal crops				
Paddy	17934.2	1595.0		
Wheat			18847.2	1172.4
Finger millet	9804.4	1595.4		
Barnyard millet	3644.0	1467.8		
Maize	2021.4	1186.6		
B.Pulse and oil seed crops				
Pea			246.3	483
Black gram	283.67	422		
Red gram	145	700		
Lentil			136.0	464
Mustard			653.3	578
C Horticulture crop				
Apple	44980	6200.71		
Pear	10287	7321.17		
Walnut	1049	774.10		
Plum	4043	5662.40		
Citrus	949	3842.10		
D Other Vegetables (Pl. specify the major crop)				
Potato			48062	18288
Vegetable pea			5621	7008
Tomato	5649	14710		
French bean	1504	8218		
Cabbage			4658	17000

* Source: Statistical hand book, Uttarkashi 2007

1.12	Sowing window for 5 major field crops	Paddy	Wheat	Finger millet	Barnyard millet	Maize
	***Kharif*- Rain fed**	15 April-15 May		15 April-15 May	15 April-15 May	End of May – 15 June
	***Kharif*-Irrigated**	End of June-End of July				
	***Rabi*- Rain fed**		15 October-15 November			
	***Rabi*-Irrigated**		Last October – Last November			

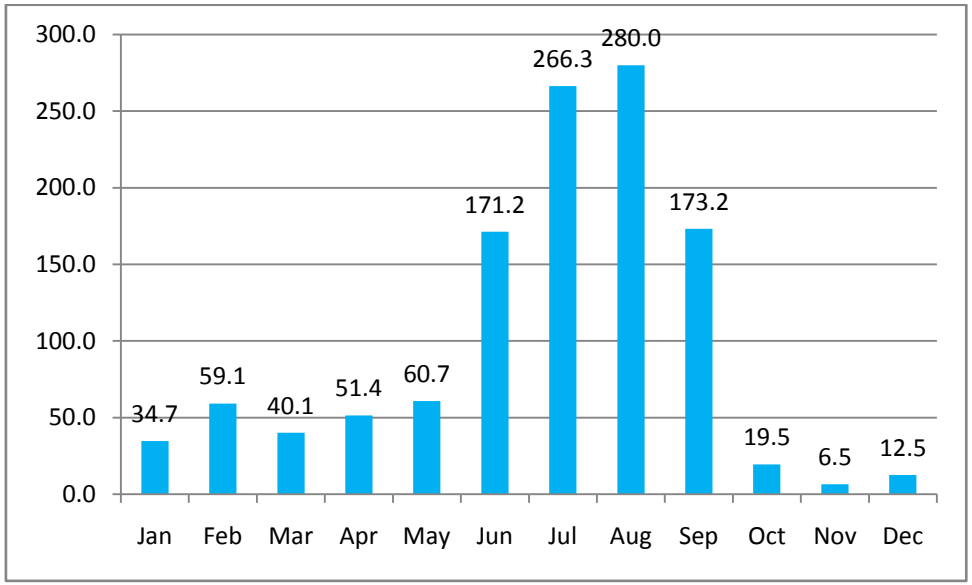
1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular (Means 6 out of 10 years)**	**Occasional (Means less than 6 years out of 10 years)**	**None**
	***Kharif* season**			
	Drought		√	
	Flood		√	
	Cold wave			√
	Frost			√
	Cyclone			√
	Heat wave			√
	Sea water inundation			√
	Hail storm		√	
	Pests and diseases (specify)	√		
	***Rabi* season**			
	Drought	√		
	Flood			√
	Cold wave		√	
	Frost		√	
	Cyclone			√
	Heat wave			√
	Sea water inundation			√
	Hail storm		√	
	Pests and disease outbreak (Borers,	Fruit fly of guava, mango, and cucurbits , rice leaf	Rice stem borer, rice hispa, wheat aphid,	Not applicable

	Fungal, Bacterial and Viral diseases) (Specify only those pest and diseases that are triggered due to unusual wet weather conditions)	folder, potato tuber moth, leaf hopper and mealy bug in mango, 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	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	

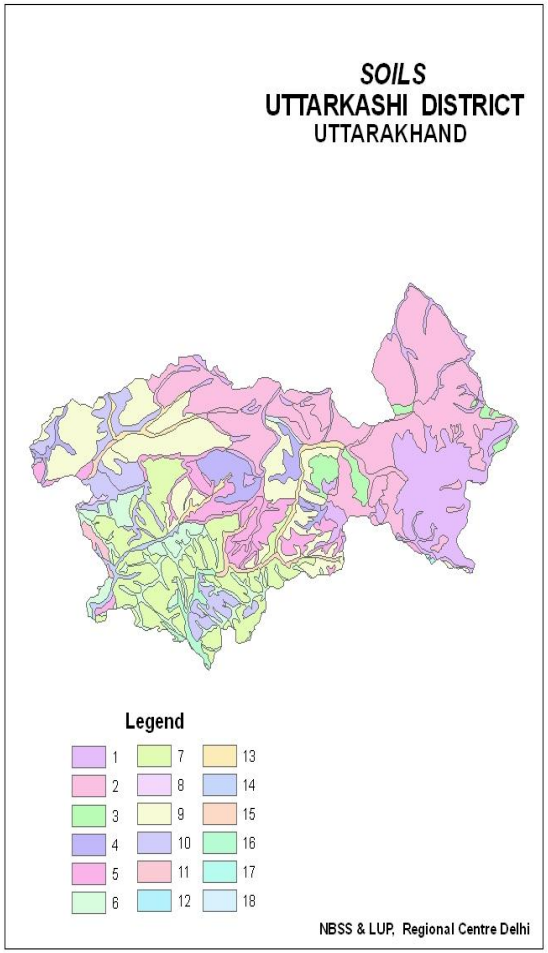
1.14	**Include Digital maps of the district**	Location map of district within State as **Annexure I**	Enclosed: **Yes**✓
		Mean annual rainfall as **Annexure 2**	Enclosed: **Yes**✓
		Soil map as **Annexure 3**	Enclosed: **Yes**✓

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

Annexure 02 : Average month-wise rainfall (mm) of district Uttarkashi



Annexure III. Soil map of District Uttarkashi



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.
3. Shallow, loamy soils, very severely eroded associated with loamy-skeletal soils, very severely eroded and strong stoniness .

Summits and Ridges (30-50% Slopes)

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

Side Slopes (30-50% slopes)

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

Glacio-Fluvial Valley (3-5% slopes)

13. Medium deep, loamy soils and moderately eroded and moderate stoniness associated with rock outcrops .

Fluvial Valley (3-5% slopes)

14. Medium deep, loamy soils and moderately eroded associated with deep loamy soil
15. Deep, loamy soils, moderately eroded and moderate stoniness associated with loamy skeletal soils
16. Deep loamy soils and slightly eroded

Cliffs (>50% slopes)

17. Rock outcrops associated with shallow, loamy soils, very severely eroded and strong stoniness .

Piedmont Plain (1-3% slope)

18. Deep, loamy soils and slightly to 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 lower hills and Valley	Spring rice (End Mach -Mid April)-Veg. pea	Spring rice (VL Dhan 206, VL Dhan 207)-Use of short duration varieties (VL Dhan-154, VL Dhan-221)	Life saving water application, mulching with available farm residue. Increase seed rate	Dept. of Agriculture, VPKAS and KVK
		Finger millet/ Barnyard millet - pea/ lentil/ wheat,	Finger millets (VLMandua 146, VLMandua 149, VLMandua 315, VLMandua 324, /Barn yard Millet (VL Madira 172,VLMadira 207)+ Black soybean / Horse gram (VLGahat 8 and VL Gahat 15)	Increased seed rate, Intercropping, Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with *Trichoderma*, Dust mulching,	Dept. of Agriculture, VPKAS and KVK
	Mid hills	Spring rice (End Mach -Mid April)-Veg. pea	Spring rice (VL Dhan 206, VL Dhan 207, VL Dhan 208, VL Dhan 209)	Life saving water, mulching with available farm residue. Increase seed rate.	Dept. of Agriculture, VPKAS and KVK

		Finger millet/ Barnyard millet - pea/ lentil/ wheat,	Finger millets (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)/ Barn yard Millet (VL M 172,VLM 207)+ Black soybean / Horse gram (VLG 1, VLG 8, VLG 15)	Increased seed rate, Intercropping With Finger millet, Barn yard Millet Timely weeding, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with *Trichoderma*, Dust mulching,	Dept. of Agriculture, VPKAS and KVK
		Maize-wheat	Maize (Vivek makka Hybrid 15, 21,25 Vivek Makka 33,23), Vivek Makka composite 31,35 Baby Corn -VL Makka 42	Sowing method, intervention, higher seed rate, addition of organic manures (FYM/compost) @ 5-10 t/ha	Dept. of Agriculture, VPKAS and KVK
	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 With Finger millet Timely weeding, Addition of organic matter (compost or FYM)	Dept. of Agriculture, VPKAS and KVK

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 4 weeks **3rd week of July**	Rainfed lower hills and Valley	Spring rice-Veg. pea	Finger millet (VLMamdua 146, VLMandua 149, VLMandua 315	Change of Crop, Use failed crop as fodder, addition of organic manures (FYM/compost) @ 5-10 t/ha treated with *Trichoderma viride*	Dept. of Agriculture, VPKAS and KVK
		Finger millet/ Barnyard millet - pea/ lentil/ wheat,	Finger millet (VLMandua 146) Change of crop Barnyard millet (VL Madira-172)	Use of short duration varieties, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with *Trichoderma viride* Sowing may be delayed till appropriate soil moisture condition reaches	
		Rice-wheat	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 *Trichoderma*	
		Rice-cabbage-Maize (green cob), Rice- Cabbage- Potato	Change of crop Finger millets (VLM 146)	Increased seed rate Mulching,	Dept. of Agriculture,

				Sowing across the slope, Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with *Trichoderma*	VPKAS and KVK
	Mid hills	*Chaiti*/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/ Barnyard millet - pea/ lentil/ wheat,	Finger millet –VLM 146		
		Maize-wheat	Finger millet –VLM 146 Rajma (VL- Rajma 63, 125)		
	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 2nd week of Aug**	Rainfed lower hills and Valley	Spring rice (Sowing in end march to mid april)-Veg. pea	Radish (Japnese white, Doonagiri, Pusa Chetki, Pusa Himani), Rai (Hathikan), French bean (VL Bauni Bean 1, Contender, Arka Komal)	Shift towards short duration vegetable crops/proper drainage	Dept. of Agriculture, VPKAS and KVK
		Finger millet/ Barnyard millet - pea/ lentil/ wheat,			
		Rice-wheat			
		Rice-cabbage-Maize (green cob), Rice-Cabbage- Potato			
	Mid hills	Spring rice (Sowing in end march to mid april)-Veg. pea	Radish (Japnese white, Doonagiri, Pusa Chetki, Pusa Himani), Rai (Hathikan), French bean (VL Bauni Bean 1, Contender, Arka Komal)	Shift towards short duration vegetable crops/proper drainage	
		Finger millet/ Barnyard millet - pea/ lentil/ wheat			
		Maize-wheat			
		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	Cauliflower (PSB), Cabbage (Golden acre)	Shift towards short duration vegetable crops/proper drainage	

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 lower hills and Valley	Spring rice (Sowing in end march to mid april)-Veg. pea	Radish (Japnese white, Doonagiri, Pusa Chetki, Pusa Himani), Rai (Hathikan), French bean (VL Bauni Bean 1, Contender, Arka Komal)	Shift towards short duration vegetable crops/proper drainage	Dept. of Agriculture, VPKAS and KVK
		Finger millet/ Barnyard millet - pea/ lentil/ wheat			
		Rice-wheat	Radish (Japnese white, Doonagiri, Pusa Chetki, Pusa Himani), Rai (Hathikan), French bean (VL Bauni Bean 1, Contender, Arka Komal Toria (Bhawani), Spinach (Pusa Harit), French bean (VL bauni Bean 1)		
		Rice-cabbage-Maize (green cob), Rice-	Radish (Pusa Chetki, Pusa Himani), Tomato (Palam Pink, Palam Pride, Solan Sindhur), Coriander, Spinach	Change of crop/ proper drainage	

		Cabbage- Potato	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		
	Mid hills	Spring rice (Sowing in end march to mid april)-Veg. pea	Radish (Japnese white, Doonagiri, Pusa Chetki, Pusa Himani), Rai (Hathikan), French bean (VL Bauni Bean 1, Contender, Arka Komal Toria (Bhawani), Spinach (Pusa Harit), French bean (VL bauni Bean 1)	Shift towards short duration vegetable crops/proper drainage	
		Finger millet/ Barnyard millet - pea/ lentil/ wheat	Radish (Japnese white, Doonagiri, Pusa Chetki, Pusa Himani), Rai (Hathikan), French bean (VL Bauni Bean 1, Contender, Arka Komal Toria (Bhawani), Spinach (Pusa Harit), French bean (VL bauni Bean 1)		
		Maize-wheat			
	High hills	Finger millets mixed with Amaranth/ Pulses	Cauliflower (PSB), Cabbage (Golden acre)	Shift towards short duration vegetable crops/proper drainage	

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 1st week of July)	Rainfed lower hills and Valley	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,	Construction of rain water harvesting ponds through IWMP and

followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.				Mulching, Bunding, life saving irrigation	MNREGS
		Finger millet/ Barnyard millet - pea/ lentil/ wheat	Gap filling/re-sowing	rain water harvesting of surrounding fields, Use local available plant material for mulch Dry grasses, paddy straw, tree leaves, Bunding, life saving irrigation	Constructing rain water harvesting ponds through IWMP and MNREGS
		Rice-wheat	Gap filling through seedlings	rain water harvesting of surrounding fields, Use local available plant material for mulch, dry grasses, paddy straw, tree leaves etc. Bunding, life saving irrigation	Construction of rain water harvesting ponds through IWMP and MNREGS
	Mid hills	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	Construction of rain water harvesting ponds through IWMP and MNREGS
		Finger millet/ Barnyard millet	Gap filling/re-sowing		
		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	Construction of rain water harvesting ponds through IWMP and MNREGS

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	Spring rice (End Mach -Mid April)-Veg. pea	Life saving irrigation if available	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	Construction of rain water harvesting ponds through IWMP and MNREGS as a long term drought proofing measure
		Finger millet/ Barnyard millet - pea/ lentil/ wheat			
		Rice-wheat			
	Mid hills	Spring rice (End Mach -Mid April)-Veg. pea	, 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 *in-situ* mulching with dry grasses, paddy straw etc.	Construction of rain water harvesting ponds through IWMP and MNREGS as a long term drought proofing measure
		Finger millet/ Barnyard millet - pea/ lentil/ wheat			
		Maize-wheat			
	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 *in-situ* 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

Condition	Suggested contingency measures				
Early season drought (Normal onset) **At reproductive stage and terminal stage**	**Major farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measure**	**Remarks on implementation**
	Rainfed lower hills and Valley	Spring rice (End Mach -Mid April)-Veg. pea Finger millet/ Barnyard millet - pea/ lentil/ wheat Rice-wheat	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 • 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	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.	Construction of rain water harvesting ponds through IWMP and MNREGS as a long term drought proofing measure
	Mid hills	Spring rice (End Mach -Mid April)-Veg. pea Finger millet/ Barnyard millet - pea/ lentil/ wheat Maize-wheat	Site-specific crop management technologies: • Life saving irrigation, if available • Anti-transparent spray • Salicylic acid spray to induce earliness • If grain setting has occurred in 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	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	Construction of rain water harvesting ponds through IWMP and MNREGS as a long term drought proofing measure
	High hills	Finger millets mixed with Amaranth/	Site-specific crop management technologies: • Life saving irrigation, if available	Foliar N management (1 % urea spray)	Construction of rain water harvesting

		Pulses	• Anti-transparent spray • Salicylic acid spray to induce earliness • Harvesting at physiological maturity	instead of top N dress; Efficient weed management and their *in-situ* mulching, Use local available plant material for mulch	ponds through IWMP and MNREGS 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	Rainfed lower hills and Valley	Vegetable pea **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	-Nil-
		Lentil **Finger millet-lentil**	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Intercropping with lentil and pea Late sown wheat (VL892, HS-420)	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Mid hills	Vegetable pea **Spring rice (End Mach - Mid April)-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

		Finger millet- veg. pea			KVK
		Lentil **Finger millet-lentil**	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Intercropping with lentil Late sown wheat (VL892, HS-420)	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	High hills	-	-	-	-

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 4 weeks **3rd week of January**			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
	Rainfed lower hills and Valley	Vegetable pea **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	-Nil-
		Lentil **Finger millet-lentil**	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	

		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Late sown wheat (VL892) 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	
	Mid hills	Vegetable pea **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	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Late sown wheat (VL892,HS 420) 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	
	High hills	-	-	-	-

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	Rainfed lower hills and Valley	Vegetable pea **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	-Nil-
		Lentil **Finger millet-lentil**	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	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	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	
	Mid hills	Vegetable pea **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	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Wheat	Potato (Kufri Jyoti), green	Addition of organic manures	

		Rice-wheat/Barley, Finger millet-wheat	coriander, Spinach	(FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	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	
	High hills	-	-	-	-

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Delay by 8 weeks **3rd week of Februrary**			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
	Rainfed lower hills and Valley	Vegetable pea **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	-Nil-
		Lentil **Finger millet-lentil**	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	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	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	

	Mid hills	Vegetable pea **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	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	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	
	High hills	-	-	-	-
Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Early season drought (Normal onset 20th December) **followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.**			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
	Rainfed lower hills and Valley	Vegetable pea **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	-Nil-
		Lentil **Finger millet-lentil**	No change	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt soil moisture conservation measures with locally available mulch materials	

		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Intercropping with lentil and Pea. Late sown wheat (VL892, HS-420)	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials, Site-specific crop management technologies	
	Mid hills	Vegetable pea **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	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	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Intercropping Late sown wheat (VL892, HS-420)	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	High hills	-	-	-	-

Condition	**Major Farming situation**	**Normal Crop/ cropping system**	**Suggested contingency measure**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm)			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
	Rainfed lower	Vegetable pea	Site-specific crop management technologies	Addition of organic manures (FYM/compost) @ 5-10 t/ha, adopt	-Nil-

period) **At vegetative stage**	hills and Valley	**Spring rice (End Mach - Mid April)-Veg. pea** **Finger millet- Veg. pea**		soil moisture conservation measures with locally available mulch materials	
		Lentil **Finger millet-lentil**	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	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Site-specific crop management technologies	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
	Mid hills	Vegetable pea **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	Supply of seeds through TDC, NSC, Dept. of Agriculture and KVK
		Lentil **Finger millet-lentil**	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	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Site-specific crop management technologies	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	
		Wheat **Rice-wheat/Barley, Finger millet-wheat**	Site-specific crop management technologies	Addition of organic manures (FYM/compost) @ 5-10 t/ha, soil moisture conservation measures with locally available mulch materials	

	High hills	-	-	-	-

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 20th of June with pre monsoon showers)**	lower hills and Valley	Rice-wheat	Rice (VL Dham\n 81, 82, 61, 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 Dept. of Agriculture and KVK
		Rice-cabbage-Maize (green cob), Rice- Cabbage- Potato	Rice (VL Dham\n 81, 82, 61, 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 **3rd week of July**	lower hills and Valley	Rice-wheat	Rice (VL Dham\n 81, 82, 61, 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 (VL Dham\n 81, 82, 61, 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**		
Delay by 6 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
1st week of August	lower hills and Valley	Rice-wheat	Rice (VL Dham\n 81, 82, 61, 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 Dept. of Agriculture and KVK
		Rice-cabbage-Maize (green cob), Rice- Cabbage- Potato	Rice (VL Dham\n 81, 82, 61, 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**		
Delay by 8 weeks			**Change in crop/ cropping system**	**Agronomic measure**	**Remarks on implementation**
3rd week of August	lower hills and Valley	Rice-wheat	Rice (VL Dham\n 81, 82, 61, 62)	Foliar N management (1% Urea 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 (VL Dham\n 81, 82, 61, 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**		
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**	lower hills and Valley	**Wheat** Rice-wheat	Late sown wheat (VL892, HS-420)	Foliar N management (1% Urea 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 Dept. of Agriculture and KVK

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	lower hills and Valley	**Wheat** Rice-wheat	Late sown wheat (VL892, HS-420)	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-

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	lower hills and Valley	**Wheat** Rice-wheat	Change of Crop Potato (Kufri Jyoti), green coriander, Spinach	Foliar N management (1% Urea 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 Dept. of Agriculture and KVK

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	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	-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 rainfall 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 rainfall	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				
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**			
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, 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	Not applicable
Horticulture				
Apple, Pear, Peach, Plum	Drain out excess water through drainage channel	Drain out excess water through drainage channel	Drain out excess water through drainage channel	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
Heavy rainfall with high speed winds in a short span[2]				
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
Horticulture				
Pome Fruits (Apple& Pear)	• Drain out excess water through drainage channel and Earthing up around the trunk • Apply 40-50 kg FYM/ tree or recommended nutrients	• Drain out excess water through drainage channel and Earthing up around the trunk • Use supplement pollination techniques to improve	• Complete drainage, Channelization of excess water • Till the soil within the basin to improve soil aeration and	• Complete drainage, Channelization of excess water • Harvest the fruit on clear sunny day

		pollination and fruit set.	control weeds	• Proper storage and immediate transportation to market/godown • Apply 40-50 kg FYM/ tree or recommended nutrients
Other Temperate Fruits (Stone Fruit)	• Drain out excess water through drainage channel and Earthing up around the trunk • Soil working to improve soil aeration and to control weeds • Apply 40-50 kg FYM/ tree or recommended nutrients	• Drain out excess water through drainage channel and Earthing up around the trunk • Soil working to improve soil aeration and to control weeds • 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 to control weeds	• Complete drainage, Channelization of excess water • Harvest the fruit on clear sunny day • Apply 40-50 kg FYM/ tree or recommended nutrients
Walnut & Dry Fruits	Drain out excess water through drainage channel	Drain out excess water through drainage channel	Drain out excess water through drainage channel	Drain out excess water through drainage channel
Other fruits	• Drain out excess water through drainage channel and Earthing up around the trunk • Apply 40-50 kg FYM/ tree or recommended nutrients	• Drain out excess water through drainage channel and Earthing up around the trunk • Till the soil to improve soil aeration and to control weeds • 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 to control weeds • Apply 40-50 kg FYM/ tree or recommended nutrients	• Drain out excess water through drainage channel • 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 Fingermillet	**<u>Brown plant hopper</u>**	**<u>Brown plant hopper</u>** Drain water before use of	**<u>Stem Borer</u>**: Prolonged moist and humid condition leads to outbreak. Spray Cartap	Not applicable

	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 **Stem Borer**: Prolonged moist and humid condition leads to outbreak. Spray Cartap hydrochloride 25 kg/ha	insecticides and direct the spray towards the base of the plants. Monocrotophos @ 500 ml/ac. (or) Acephate 200 g /ac. **Blast:** Spray after observing initial infection of the disease, Carbendazim @ 1 g/l.	hydrochloride 25 kg/ha **False smut in fingermillet and rice**: Spray cuprous hydroxide 0.25 %	
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	**Root rot**: Soil drenching with carbendazim 0.1 %, **Powdery mildew**: Spray carbendazim 0.1 %		
Horticulture				
Apple	**Apple scab :** Spray fungicide (Mancojeb) at 7 recommended stages. **White root rot** : Drain out excess water from the basin and drench the basin with Carbendazim 200g, or	**Apple scab :** Spray fungicide (Mancojeb) at 7 recommended stages. **White root rot** : Drain out excess water from the basin and drench the basin with Carbendazim 200g,	**Premature leaf Fall**: Follow the recommended spray schedule	Proper storage and immediate transportation to market/godown

	copper sulphate 100 g / 200 l water (3-4 time at an interval of 15-20 days)	or copper sulphate 100 g / 200 l water (3-4 time at an interval of 15-20 days)		
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 0.1 %, **Powdery mildew**: Spray Carbendazim 0.1 %	Field drainage	

2.2.2 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/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
Heavy rainfall with high speed winds in a short span[2]				
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
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	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
Horticulture				
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

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

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

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	Not applicable			
Cold wave Mango	Not applicable	Provision of Shelter belt and wind break at the time of orchard establishment	Pruning of dead shoots/burned shoots followed by light irrigation	
Frost Mango	Not applicable	Irrigation, Fuming in the orchard	Pruning of dead shoots/burned shoots followed by light irrigation	
Hailstrom				
Apple	Not applicable		Anti hail netting at fruit bearing stage/Anti hail guns installation at	Not applicable

		Departmental level	
Cyclone	Not applicable		

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	Increasing area under fodder production on waste land and terraces; Collect crop residues, and tree fodder to store at safe place, Use mangers, use chaff cutters, hay storage, and establish fodder banks and Stock sufficient Urea Molasses Mineral Block (UMMB), mineral and vitamin mix, urea treatment of crop residues	Utilization of fodder from Perennial & reserve sources, Open grazing in forests and alpine slopes/ community lands, 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, urea treatment of crop residues	Availing Insurance, culling undesirable Livestock; Raising of fodder trees, replacement of 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, cleaning and bleach of water tanks time to time.
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 mineral	-Carry out de worming to all animals, quarantine sick animals, rig vaccination (in 8km radius), restrict movement of livestock in case of epidemic, tick control, daily lifting of dung from relief camps. -Treatment of all affected livestock by mass campaign, modern veterinary care, veterinary camps , isolation, appropriate antibiotics	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 July to September (with adequate fodder supply and favorable weather conditions) in order to avoid the peak milk production during mid

	mixture, refresher trainings to Veterinary Officers and Pharmacists	/treatments could be instituted	summer
Floods			
Feed and fodder availability	Increasing area under fodder production; Collect crop residues, and tree fodder to store at safe place, Use mangers, use chaff cutters, hay storage, and establish fodder banks and Stock sufficient Urea Molasses Mineral Block (UMMB), mineral and vitamin mix in moisture proof condition, 4% urea treatment of dry fodder	Evacuation to safer places	Availing Insurance,
Drinking water	Storage of water in tanks , Traditional water ponds , rivers	Arrange safe drinking water	Arrange safe drinking water
Health and disease management	Advance preparation with medicines and vaccination for FMD, PPR (Rinderpest in sheep and goat) & Dysentery, and local ethno pharmaceutical and alternate medicines, Deworming for flukes and roundworms.	Availability of veterinary staff, to provide quick treatment and relief to affected animals	
Cyclone			
Feed and fodder availability	Not Applicable		
Drinking water			
Health and disease management			

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 lassi syrup (curd juice) to animals, avoid exposure to cold and rains/ snow. Provision of fans /shade during heat wave and give multivitamins minerals	Open grazing in sunny days and feeding of medicinal herbs. In case of acute problem contact local veterinarian

2.5.2 Poultry

	Suggested contingency measures			**Convergence/linkages with ongoing programs, if any**
	Before the event	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	Surplus storage of poultry feed ; No special preparations these are kept as backyard activity	• Utilization of surplus feed; No impact as these is kept in captivity. • Moreover these are kept as backyard and household waste is sufficient for their keeping	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	• Advance preparation with medicines and vaccination • Promote hardy and disease resistant	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

management	poultry birds like kroiler, guinea fowl and desi birds procured from reliable sources.			
Floods				
Shortage of feed ingredients	Surplus storage of poultry feed in water/moisture proof condition; No special preparations these are kept as backyard activity	• Utilization of surplus feed; No impact as these is kept in captivity. • Moreover these are kept as backyard and household waste is sufficient for their keeping	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 and use the water after treatment with suitable antibiotics	Utilize stored treated water	Kept as small scale / backyard activity	Water storage structures can be constructed in collaboration with MNERAGA
Health and disease management	Advance preparation with medicines and vaccination	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
Cyclone				
Shortage of feed ingredients	Not Applicable			
Drinking water				
Health and disease management				
Heat wave and cold wave	• Cover the sides of the poultry sheds with foldable tourpelene or gunny bags to avoid impact/heat waves • Place the hey material or grass on top of poultry shed. • Place the small cage layered with grass/hey/gunny bags inside the poultry shed to act as refuge cage.		Not Applicable	Not Applicable

Shelter/environment management	Proper Ventilation	Proper aeration and fan, open spacing, water supply, gunny bags on windows during cold wave, proper warming .supply of hot water during cold waves.	Kept as backyard activity	Not Applicable
Health and disease management	Local	Local and Veterinary care	Kept as backyard activity	Not Applicable

2.5.3 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 • Keep a deeper portion as a refuge pond / depression/trench preferably at lower side of pond	• Up to 50% of pond surface area may be covered with floating algae like azolla to reduce evaporation. • Water to supplement at least 20% of the impoundment of pond to safeguard the stocked fish biomass may be arranged if available. • Partial or complete fish harvesting may be done in extreme events to reduce the density.	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	Not applicable		
Floods	Not manageable in the torrent monsoon season		

Inundation with flood waters	Enclose the pond and inlet/outlet with suitable iron mesh net to prevent escape of stocked and incoming of wild fishes		
Water contamination and changes in BOD	Treat the water with lime		
Health and disease management	Rapid mobile veterinary team RMVT) may be formed, Provide suitable broad spectrum antibiotics (5%) with feed	Not applicable	Not applicable
Cyclone			
Overflow / flooding of ponds	Not applicable		
Change in fresh/brackish water ratio	Not applicable		
Health and disease management	Not applicable		
Heat wave and cold wave			
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	Not applicable	Not applicable