State: Uttar Pradesh

Agriculture Contingency Plan for District: Bijnor

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Northern Plain, Hot Subhumib (Dry) Eco-Region (9.1)		
	Agro-Climatic Zone (Planning Commission)	Uppar Gangatic plain Zone (V)		
	Agro Climatic Zone (NARP)	Bhabar and Terai zone(UP-2)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Pilibhit, Bareilly, Rampur, Moradabad, Shahjanpur, Badaun, Jyotibaphule Nagar		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		29^0 2' 29^0 58' N	78' 0' to 78^0 57'E	115 mt.
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZRS Nagina Bijnor, S.V.P.U. A & T, Meerut		
	Mention the KVK located in the district with address	K.V.K, Nagina of S.V.P.U. A & T		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	S.V.P.University ZRS Nagina & S.V.P.U. A & T, Meerut		

1.2	**Rainfall**	**Normal RF(mm)**	**Normal Rainy days (number)**	**Normal Onset (specify week and month)**	**Normal Cessation (specify week and month)**
	SW monsoon (June-Sep):	947.5	58	2nd week of June	3rd week of September
	NE Monsoon(Oct-Dec):	45.7	13	3rd week of December	3rd week of January
	Winter (Jan- March)	87.5	16	-	-
	Summer (Apr-May)	26.6	8	-	-
	Annual	1107.3	95	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (‘000 ha)	464.578	332.615	54.898	54.901	0.452	4.089	2.098	4.356	6.802	3.367

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area (‘000 ha)**	**Percent (%) of total**
	1. Sandy loam	91.67	27.56
	2. Loam	114.25	34.35
	3. Clay loam	71.71	21.56
	4. Silt loam	53.65	16.13
	5.		
	Others (specify):		

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	332.615	130.94%
	Area sown more than once	102.906	
	Gross cropped area	435.521	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	262.830 ha		
	Gross irrigated area	8.718 ha		
	Rainfed area	69.785		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		12.816	4.9 %
	Tanks		0.052	0.02 %
	Open wells	NA	125.360	47.70 %
	Bore wells	NA	124.603	47.41 %
	Lift irrigation schemes	NIL	-	-
	Micro-irrigation		-	-
	Other sources (please specify)		-	-
	Total Irrigated Area		262.83	
	Pump sets			

	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils Block-11	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	Aku 1	-	Not reported
	Critical	Noorpur,Jalilpur,Kritpur,Burhanpur 4	7.24,8.39,5.23,5.59	do
	Semi- critical	4	-	do
	Safe	2	-	do
	Wastewater availability and use	-	-	do
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (as per latest figures) (2008-09)

1.7	**Major field crops cultivated**	**Area ('000 ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Rice	49.403	-	49.403	-	-	-	-	49.403
	Wheat	-	-	-	110.82	-	110.82	-	110.82
	Sugarcane	-	-	-	215.833	-	215.833	-	215.833
	Mustard	-	-	-		2.011	2.011	-	2.011
	Toria	-	-	-	8.256	5.741	13.997	-	13.997
	Lentil	-	-	-	-	1.722	1.722	-	1.722
	Blackgram	-	1.289	1.289	-	-	-	1.256	2.545
	Sesamum	-	.256	.256	-	-	-	-	0.256
	Groundnut	-	1.118	1.118	-	-	-	-	1.118

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	All fruits crops	10037 ha		
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Potato	0.888	0.888	-
	Medicinal and Aromatic crops	**Total**	**Irrigated**	**Rainfed**
	Flower	0.135 ha		
	Plantation crops	**Total**	**Irrigated**	**Rainfed**
	Poplar	13.468	13.468	13.468
	Eucalyptus	6.256	-	6.256
	Eg., industrial pulpwood crops etc.			
	Fodder crops	**Total**	**Irrigated**	**Rainfed**
	Jowar	48.626	48.626	-
	Bajra	3.462	-	
	Berseem	2.394	2.394	-
	Total fodder crop area	54.482	51.020	3.462
	Grazing land	0.246	0.246	-
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding) Indi	107.165	258.461	365.626
	Crossbred cattle/Exotic Improved cattle	16.392	47.079	63.471
	Non descriptive Buffaloes (local low yielding)	114.697	351.490	466.181
	Descript Buffaloes	49.156	150.638	196.792
	Goat	31.339	54.205	85.544
	Sheep Indigenous + Exotic	3710+36	4673+101	84.463
	Others (Camel, Pig, Yak etc.)			882.011
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	0	0	
	Backyard		(38.741+50.414)=89.155	
1.10	**Fisheries** (Data source: Chief Planning Officer)			

	A. Capture						
	i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
			-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
	B. Culture						
				Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**	
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)			-	-	-	
	ii) **Fresh water** (Data Source: Fisheries Department)			-	-	-	
	Others			-	-	-	

1.11 Production and Productivity of major crops (Average of last 5 years: 2008-09 specify years)

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Rice	118.024	2389	-	-	-	-	118.024	2389	148.68
	Wheat	-	-	331.036	2987	-	-	331.036	2987	413.795
	Sugarcane	-	-	13039.767	60402	-	-	13039.767	60402	1955.85
	Mustard	-	-	2.092	1040	-	-	2.092	1040	-
	Toria	-	-	12.848	918	-	-	12.848	918	-

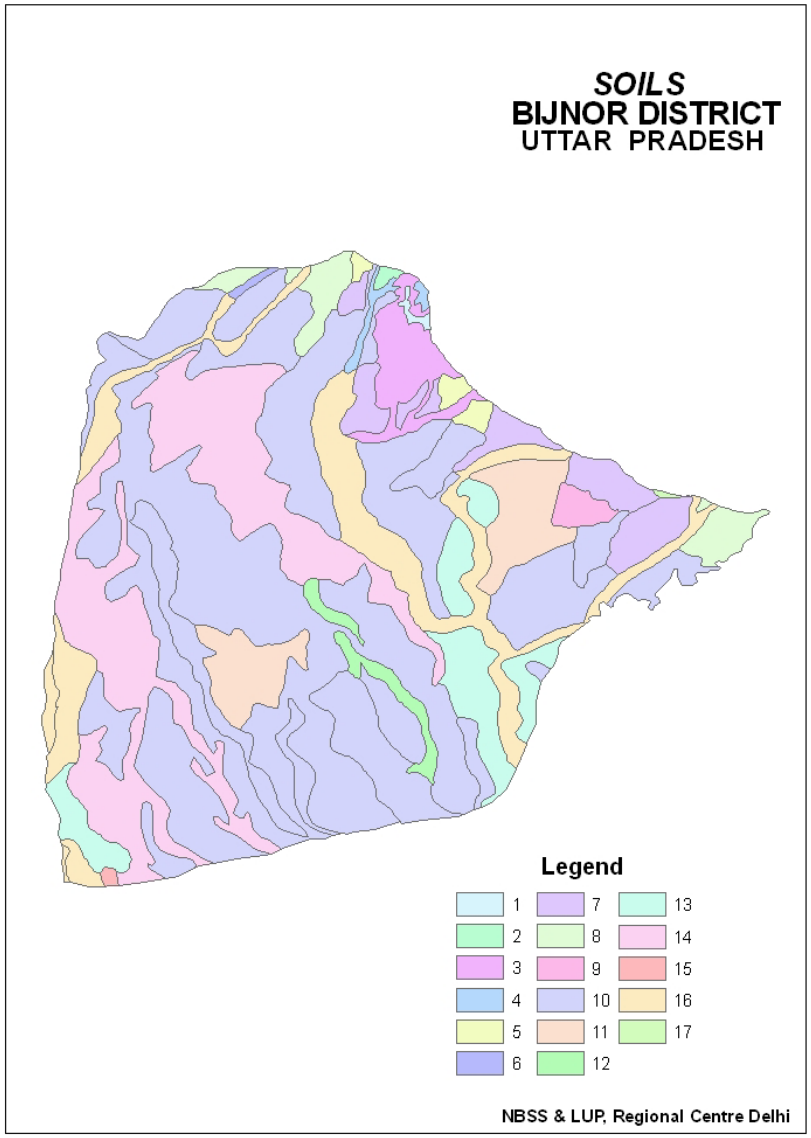
	Lentil	-	-	1.345	781	-	-	1.345	781	1.625
	Urd	1.215	943	-	-	1.184	943	2.399	943	2.99
	Til	0.027	104	-	-	-	-	0.027	104	-
	G. Nut	0.801	674	-	-	-	-	0.801	674	0.961
	Others									
Major Horticultural crops (Crops to be identified based on total acreage)										
	Potato	-	-	21.576	24278	-	-	21.576	24278	-

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Wheat**	**Sugarcane**	**Toria, Mustard**	**Sesamum, Groundnut, Blackgram**
	Kharif- Rainfed	June-July	-	-	-	July-Aug
	Kharif-Irrigated	June-July	-	-	-	July-Aug
	Rabi- Rainfed	-	Nov	-	Sep-Oct	-
	Rabi-Irrigated	-	Nov-Dec	March-April	Oct	-

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought	x	√	x
	Flood	x	√	x
	Cyclone	x	√	x
	Hail storm	x	√	x
	Heat wave	x	x	√
	Cold wave	x	√	x
	Frost	x	√	x
	Sea water intrusion	x	x	√
	Pests and disease outbreak (specify)Stem borar, Sheath blight, Neck blast, Pyrilla, White grub ,Rust etc.	√	x	x
	Others (specify) Fog	x	√	x

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 2	Enclosed: No
		Soil map as Annexure 3	Enclosed: Yes

Annexure I



Legend	Description
1	Shallow loamy-skeletal soils and medium loamy soils
2	Deep loamy soils and shallow loamy-skeletal soils
3	Deep loamy soils and loamy-skeletal soils
4,7,8,10 &13	Deep loamy soils and loamy soils
5,6 &14	Deep, loamy soils and sandy soils
9&11	Deep, loamy soils and silty soils
12	Deep, loamy soils and loamy soils(saline/sodic)
15	Deep, loamy soils (moderately saline and sodic)
16	Deep, sandy soils and loamy soils(slight flooding)
17	Deep, fine soils and fine moderate skeletal soils

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks (Specify month)* 4th week of June	Deep soil, yellow colored alluvial loam soil	Maize Sorghum Pearl millet Pigeonpea	Maize: Kanchan, Navin Navjyoti, Azad utam,Surya,Meerut pili,Ganga 2,11 Samrat etc Sorghum:CSH 14, 16, CSB 13, 15, SPB 1338 etc Pearl millet:Raj-171,WCC-75,Pusa 23, 322 ,ICMH-451 Pigeonpea: UPAS 120, ICPL 151,Pusa 33,	• Conservation furrow • Inter-cultivation • Sowing with multi seed drill • Wider spacing for pigeonpea	• Seed-drill under RKVY • Supply of seed through govt. agencies *ie*. NFSM,RKVY • Re-scheduling of canal calendar
Delay by 4 weeks (Specify month) 2nd week of July	Deep soil, yellow colored alluvial loam soil	Maize Pearl millet Sesamum Blackgram	Maize: Kanchan, Navin Navjyoti, Azad utam,Surya,Meerut pili,Ganga 2,11 Samrat etc Pearl millet: Raj-171,WCC-75,Pusa 23, 322 icmh-451 Sesamum: Pergati, Shekar, TA-78, TA-12 Blackgram: Narender urd-1, Pant U-30, 19, 35 etc	• Conservation furrow • Inter-cultivation • Sowing with multi seed drill	Seed-drill under RKVY Supply of seed through govt. agencies *ie*. NFSM
Delay by 6 weeks 4th week of July	Others	Blackgram/Greengram Toria Pearl millet	Blackgram: Narender urd-1, Pant U-30, 19, 35 Greengram:Pantmoong -2, 3, Narender mung -1, 4, SML-668, PDM-11 Pearl millet: Raj-171,WCC-75,Pusa 23, 322 ICMH-451	Sowing with multi seed drill	Re-scheduling of canal calendar
Condition			**Suggested Contingency measures**		
Early season drought	**Major Farming situation[a]**		**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**

Delay by 8 weeks 2nd week of August	Deep soil, yellow colored alluvial loam soil	Toria	Toria: P.T.-30, 507, 303, Bhawani, T-9	• Conservation furrow • Inter-cultivation • Sowing with multi seed drill	• Seed-drill under RKVY • Supply of seed through govt. agencies *ie*. NFSM

Condition			**Suggested Contingency measures**		
Early season drought (Normal onset)	**Major Farming situation**[a]	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Irrigated upland	Rice: PS 4, 5, PB 1, PRH 10 Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284 Sesamum:T-4 ,T-12, T-13, T-78, Shekar, Pergati Maize: Kanchan, Sweta, Navin, Surya, Azad uttam, Navjyoti, Jaunpuri, Meerut pili Sorghum (Fodder): Kanpuri, UP Chari 1,2, Pant Chari3, HC 308, 171	1. Thinning, weeding and gap filling in existing crop. 2. Re sowing 3. Selection/nursery sowing of short duration rice cultivar	• Inter cultivation • Conservation furrow • Thinning and weeding • Mulching	• Supply of inter cultural implements through RKVY • Farm ponds through IWSM programme • Pulse crop seeds supply through NFSM
	Irrigated lowland	Rice: PS 2,3, PB 1, Sarju 52, Pant 4, Narendra 359, Saket 4 Sorghum (Fodder): Kanpuri, UP Chari 1,2, Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284			

	Un irrigated upland	Maize/Sorghum: Local Merut pili Toria: T-36,T-9,Bhawani, PT-30,303,507 Pigeonpea: UPAS 120, ICPL 151			
	Un irrigated lowland	Pearl millet: Local, Merut pili Sesamum:T-4 ,T-12, T-13, T-78, Shekar, Pergati			

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Irrigated upland	Rice: PS 4, 5, PB 1, PRH 10 Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284 Sesamum:T-4 ,T-12, T-13, T-78, Shaker, Pergati Maize: Kanchan, Sweta, Navin, Surya, Azad uttam, Navjyoti, Jaunpuri, Meerut pili Sorghum (Fodder): Kanpuri, UP Chari 1,2, Pant Chari3, HC 308, 171	1. Thinning, weeding and gap filling in existing crop. 2. Re sowing 3.Postponement of top dressing 4.Life saving irrigation	• Inter cultivation • Conservation furrow • Thinning and weeding • Mulching	• Supply of inter cultural implements through RKVY • Farm ponds through IWSM programme • Pulse crop seeds supply through NFSM • Micro/drip/sprinkler irrigation under govt. schemes
	Irrigated lowland	Rice: PS 2,3, PB 1, Sarju 52, Pant 4, Narendra 359, Saket 4 Sorghum (Fodder): Kanpuri, UP Chari 1,2, Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284			
	Un irrigated upland	Maize/Sorghum: Local Merut pili Toria: T-36,T-9,Bhawani, PT-30,303,507 Pigeonpea: UPAS 120, ICPL 151			
	Un irrigated lowland	Pearl millet: Local Merut pili Sesamum:T-4 ,T-12, T-13, T-78, Shekar, Pergati			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	Irrigated upland	Rice: PS 4, 5, PB 1, PRH 10 Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284 Sesamum:T-4 ,T-12, T-13, T-78, Shekar, Pergati Maize: Kanchan, Sweta, Navin, Surya, Azad uttam, Navjyoti, Jaunpuri, Meerut pili Sorghum (Fodder): Kanpuri, UP Chari 1,2, Pant Chari3, HC 308, 171	1. Thinning, weeding and gap filling in existing crop. 2.Life saving irrigation 3. Weeding and weed mulching	• Conservation furrow • Thinning and weeding • Mulching • Urea spray or KCL spray	• Farm ponds through IWSM programme
	Irrigated lowland	Rice: PS 2,3, PB 1, Sarju 52, Pant 4, Narendra 359, Saket 4 Sorghum (Fodder): Kanpuri, UP Chari 1,2, Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284			
	Un irrigated upland	Maize/Sorghum: Local Merut pili Toria: T-36,T-9,Bhawani, PT-30,303,507 Pigeonpea: UPAS 120, ICPL 151			
	Un irrigated lowland	Pigeonpea: UPAS 120, ICPL 151 Pearl millet: Local Merut pili Sesamum:T-4 ,T-12, T-13, T-78, Shekar, Pergati			

Condition			Suggested Contingency measures		
	Major Farming situation[a]	**Normal Crop/cropping system[b]**	**Crop management**	**Rabi crop planning**	**Remarks on Implementation**
Terminal drought (Early withdrawal of monsoon)	Irrigated upland	Rice: PS 4, 5, PB 1, PRH 10 Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284 Sesamum:T-4 ,T-12, T-13, T-78, Shekar, Pergati Maize: Kanchan, Sweta, Navin, Surya, Azad uttam, Navjyoti, Jaunpuri, Meerut pili Sorghum (Fodder): Kanpuri, UP Chari 1,2, Pant	1.Life saving irrigation 2. Picking/harvesting of pods/ear 3.Harvest at physiological maturity stage 4.Harvest for fodder	• Toria/mustard • Potato • Pea/gram • Berseem/oat • Land levelling	• Farm ponds through IWSM programme • Supply of seed through ISOPM

		Chari3, HC 308, 171			• Harvesting and threshing implements through RKVY • Supply of land lazer labeler through CLDP or RKVY
	Irrigated lowland	Rice: PS 2,3, PB 1, Sarju 52, Pant 4, Narendra 359, Saket 4 Sorghum (Fodder): Kanpuri, UP Chari 1,2, Sugarcane: 64, 88230, 92254, 95255, COS 767, 8432, 97284			
	Un irrigated upland	Maize/Sorghum**:** Local Merut pili Toria: T-36,T-9,Bhawani, PT-30,303,507 Pigeonpea: UPAS 120, ICPL 151			
	Un irrigated lowland	Pigeonpea: UPAS 120, ICPL 151 Pearl millet: Local, Merut pili Sesamum:T-4 ,T-12, T-13, T-78, Shekar, Pergati			

1.1.2. Drought Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/ cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release of water in canals due to low rainfall	Upland sandy loam soils	Rice (Basmati)-Wheat	Replace rice with maize or aerobic rice Rice: PS 4, 5, PB 1, PRH 10 Maize: Kanchan, Sweta, Navin, Surya	• Use short duration varieties Light irrigation with tube well water • Follow alternate wetting and drying schedule of irrigation in rice • Alternate Furrow irrigation • Mulching in sugarcane/maize	• Seed through KSSC and NFSM • Adequate supply of electricity/diesel should be ensured by the Govt. agencies.
		Sorghum (Fodder)/Maize-Potato/ Wheat	Pearl millet/Greengram/ Blackgram - Potato/ Wheat Pearl millet: WCC-75,Raj-171,Pusa-23,Pusa-322		
		Sugarcane +cucurbits –Ratoon-Wheat	No change required		
	Lowland clay loam soils	Rice-wheat	Basmati rice –Wheat Rice: PS 4, 5, PB 1, PRH 10 Kanchan, Sweta, Navin, Surya	• Use short duration varieties Light irrigation with tube well water • Follow alternate wetting and drying schedule of irrigation in rice • Alternate Furrow	• Seed through KSSC and NFSM • Adequate supply of electricity/diesel should be ensured by the Govt. agencies.
		Sorghum Fodder-Wheat	Pearl millet-Wheat Pearl millet fodder: WCC-75, Raj-171, Pusa-23, Pusa-322		

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/ cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
				irrigation • Mulching in sugarcane	
		Sugarcane-Ratoon-Wheat	No change required		

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Limited release of water in canals due to low rainfall	Upland sandy loam soils	Rice (Basmati)-Wheat	No change required	• Light irrigation with tube well water at critical stages only e.g CRI, Tillering &.Flowering stage • Follow alternate wetting and drying schedule of irrigation in rice • Alternate Furrow irrigation • Mulching in sugarcane/maize	• Adequate supply of electricity/diesel should be ensured by the Govt. agencies.
		Sorghum (Fodder)/Maize-Potato/ Wheat	No change required		
		Sugarcane +cucurbits –Ratoon-Wheat	No change required		
	Lowland clay loam soils	Rice-wheat	No change required	• Light irrigation with tube well water at critical stages only e.g CRI, Tillering &.Flowering stage • Follow alternate wetting and drying schedule of irrigation in rice • Alternate Furrow irrigation • Mulching in sugarcane	• Supply of inter cultural implements through RKV • Adequate supply of electricity/diesel should be ensured by the Govt. agencies.
		Sorghum Fodder-Wheat	No change required		
		Sugarcane-Ratoon-Wheat	No change required		

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Non release of water in canals under delayed onset of	Upland tube well irrigated canal sandy loam soil	Basmati rice	Maize/Aerobic Rice	• Limited irrigation • Alternate Furrow irrigation • Drip irrigation	• Seed through KSSC and NFSM • Supply of inter
		Sorghum/Maize	Pearl millet /Pigeonpea/Blackgram		
		Sugarcane +cucurbits	Sugarcane		

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
monsoon in catchment				• Mulching	cultural implements through RKVY •
	Lowland tube well irrigated canal clay loam soil	Rice	Pearl millet/ Blackgram/Greengram	• Limited irrigation • Alternate Furrow irrigation • Drip irrigation • Mulching • Alternate furrow irrigation	• Seed through KSSC and NFSM • Harvesting and threshing implements through RKVY
		Sorghum Fodder	Pearl millet/Sorghum Fodder		
		Sugarcane + cucurbits	Sugarcane		
Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1) Farming situation: Mention source of irrigation, topography	**Cropping system 1:**	NA	NA	NA

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient groundwater recharge due to low rainfall	Upland tube well irrigated canal sandy loam soil	Basmati rice	Maize/Aerobic Rice /Vegetable (Tomato, Brinjal, cucurbits etc)	• Limited irrigation • Alternate Furrow irrigation • Drip irrigation • Mulching	• Seed through KSSC and NFSM • Harvesting and threshing implements through RKVY
		Sorghum/Maize	Pearl millet /Pigeonpea/Blackgram		
		Sugarcane +cucurbits	Sugarcane		
	Lowland tube well irrigated canal clay loam soil	Rice	Pearl millet/ Blackgram/Greengram	• Limited irrigation • Alternate Furrow irrigation • Drip irrigation • Mulching • Alternate furrow irrigation	• Seed through KSSC and NFSM • Micro/drip/sprinkler irrigation under govt. schemes • Supply of inter cultural implements through RKVY
		Sorghum Fodder	Pearlmillet/SorghumFodder		
		Sugarcane + cucurbits	Sugarcane		

2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Maize + Blackgram/Greengram/Cucurbits	Provide drainage	Provide drainage	Drain out excess water, Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Sugarcane	Provide drainage	NA	Drain out excess water and harvest the lodged crop as early as possible	Supply to sugar mills /crusher as early as possible or shift to safer place and cover the cane with trash materials
Blackgram/Greengram	Provide drainage	Provide drainage	Drain out excess water. Harvesting at physiological maturity stage.	Safe storage against storage pest and disease
Horticulture				
Okra	Provide drainage	Provide drainage	Picking of vegetables at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Cucurbits	Provide drainage	Provide drainage	Drain out excess water & Harvesting at physiological maturity stage and picking of cucurbits crop.	Shift to safer place & dispose of produce as early as possible
Brinjal	Provide drainage	Provide drainage	Picking at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Tomato	Provide drainage	Provide drainage	Picking at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Mango	-	-	Spray of 2% urea + Carbendazim 0.02% solution	-

Guava	-	-	Spray of 2% urea + Carbendazim 0.02% solution	-
Heavy rainfall with high speed winds in a short span[2]				
Sugarcane	• Earthing up • Tying	NA	Drain out excess water and harvest the lodged crop as early as possible	Supply to sugar mills /crusher as early as possible or shift to safer place and cover the cane with trash materials
Maize/Sorghum	Provide drainage	Provide drainage Use Wind breaks	Drain out excess water & Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Blackgram/Greengram	Provide drainage	Provide drainage Use Wind breaks	Drain out excess water & Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Rice basmati	Provide drainage	Provide drainage	Drain out excess water & Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Pigeonpea	• Provide drainage • Sowing on raised bed	Provide drainage	Drain out excess water & Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Horticulture				
Okra	• Provide drainage • Sowing on raised bed	Provide drainage	Drain out Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Brinjal	• Provide drainage • Sowing on raised bed	Provide drainage	Drain out Harvesting at physio-logical maturity stage	Shift to safer place & dispose of produce as early as possible
Tomato	• Provide drainage • Sowing on raised bed • Stacking	Provide drainage Use Wind breaks Stacking	Drain out Harvesting at physio-logical maturity stage Stacking	Shift to safer place & dispose of produce as early as possible
Cauliflower	• Provide drainage • Sowing on raised bed	Provide drainage	Drain out Harvesting at physio-logical maturity stage	Shift to safer place & dispose of produce as early

				as possible
Cucurbits	• Provide drainage • Sowing on raised bed	Provide drainage	Drain out Harvesting at physio-logical maturity stage	Shift to safer place & dispose of produce as early as possible
Mango	Use Wind breaks	Use of NAA spray	Use of NAA spray	-
Guava	Use Wind breaks	Use of NAA spray	Use of NAA spray	-
Outbreak of pests and diseases due to unseasonal rains				
Rice basmati	Need based plant protection IPDM for Rice/pluses	Need based plant protection IPDM for Rice/pluses	Do not use strong pesticide at maturity stage	Shift to safer place & dispose of produce as early as possible
Sugarcane				
Sorghum fodder				
Blackgram/Greengram				
Pigeonpea				
Horticulture				
Okra	Need based plant protection IPDM for Rice/pluses	Need based plant protection IPDM for Rice/pluses	Do not use strong pesticide at maturity stage	Shift to safer place & dispose of produce as early as possible
Brinjal				
Tomato				
Cucurbits				
Cauliflower				

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice basmati	• Re sowing of nursery • Direct sowing of rice • Sowing of nursery on raised bed	Provide drainage	Provide drainage	Shift to safer place
Sugarcane	Direct sowing	Provide drainage	Provide drainage	Shift to safer place
Sorghum fodder	Direct sowing	Provide drainage	Provide drainage	Shift to safer place

Blackgram/Greengram	Direct sowing	Provide drainage	Provide drainage	Shift to safer place
Pigeonpea	Direct sowing	Provide drainage	Provide drainage	Shift to safer place
Horticulture				
Okra	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place
Brinjal	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place
Tomato	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place
Continuous submergence for more than 2 days[2]				
Rice	• Re sowing of nursery • Direct sowing of rice • Sowing of nursery on raised bed	Provide drainage	Provide drainage	Shift to safer place
Horticulture	NA	NA	NA	NA
Okra	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place
Brinjal	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place
Tomato	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place
Mango	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place
Sea water intrusion[3]	NA	NA	NA	NA
Crop1				
Crop2				

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

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice basmati	• Re sowing of nursery • Direct sowing of rice • Sowing of nursery on raised bed	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Sugarcane	Direct sowing	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Sorghum fodder	Direct sowing	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Blackgram/Greengram	Direct sowing	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Pigeonpea	Direct sowing	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Horticulture				
Okra	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Brinjal	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Tomato	• Re sowing of nursery • Sowing of nursery on raised bed	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early

	• Re transplanting			as possible
Continuous submergence for more than 2 days[2]				Shift to safer place & dispose of produce as early as possible
Rice	• Re sowing of nursery • Direct sowing of rice • Sowing of nursery on raised bed	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Horticulture				Shift to safer place & dispose of produce as early as possible
Okra	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Brinjal	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Tomato	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Mango	• Re sowing of nursery • Sowing of nursery on raised bed • Re transplanting	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early as possible
Sea water intrusion[3]	NA	NA	NA	NA
Crop1				
Crop2				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability	• Fodder crop Insurance • Making of feed blocks • Encourage farmers to allocate some lands for cultivating perennial fodder (Napier grass, Subabul), specially on bunds and wasteland • Establishing fodder banks, encouraging fodder crops in irrigated area • Making silage or hay of excess fodder. • Statistics regarding feed/fodder availability and requirement should be updated by the concerned department. • Seed production and development of drought resistant crops and their varieties of fodder crops. • Encourage farmers to adopt sprinkler irrigation system. • Training to the farmers and extension functionaries for production and long term storage of feed and fodder.	• Utilizing fodder from perennial trees/shrubs/fodder bank reserves for small ruminant. • Utilizing stored fodder as silage, hay, feed blocks & mixture etc. • Migration of herd /flock to other places. • Establishment of communication and linkage with other state agencies.	• Availing crop insurance • Cultivation of fast growing green fodder crops. • Development of drought resistance fodder. • Increase the number of Fodder Banks for future use.
Drinking water	• Preserving water in the pond/tank for drinking purpose. • Excavation of bore well/creation of tanks or ponds. • De-silting of village ponds on regular basis and adopt water harvesting techniques through water shed approach. • Filling of the ponds with canal/tube well water during lean period.	• Using preserved water in the tanks for drinking • Available ground water should be used for drinking on priority basis.	Recharge of well/ Tanks etc.
Health and disease	• Farmers should be encouraged to avail	• Conduction mass animal health camp and	• Availing insurance benefits.

management	Livestock insurance • Training to livestock owners regarding natural calamities. • Veterinary preparedness with medicines and vaccines. • Vaccination	treating the effected animals. • Mass campaigning though different media regarding possible outbreak of diseases and their management.	• Followed standard Livestock management practices. • Proper health care & treatment.
Floods			
Feed and fodder availability	• Fodder crop Insurance • Making of feed blocks • Encourage farmers to allocate some lands for cultivating perennial fodder (Napier grass, Subabul), specially on bunds and wasteland • Establishing fodder banks, encouraging fodder crops. • Making silage or hay of excess fodder and that should be stored on up land. • Statistics regarding feed/fodder availability and requirement should be updated by the concerned deptt. • Seed production and development of crops and their varieties of fodder crops for water logged conditions. • Training to the farmers and extension functionaries for production and long term storage of feed and fodder.	• Utilizing fodder from perennial tress/shrubs/fodder bank reserves. • Use of feed mixture/block hay etc • Migration of flock /herds • Establishment of communication and linkage with other state agencies	• Availing crop insurance • Cultivation of fast growing green fodder crops
Drinking water	• Making suitable provision for safe drinking surface water including excavation of bore well/hand pump (India mark—II) at community level. • Make farmers aware not to use contaminated/ flood water for drinking purpose.	Contaminated flood water should not be used for drinking.	Open sources of drinking water (tank/well) should be further treated with potassium per manganate.
Health and disease management	• Live stock Insurance • Training to livestock owners regarding natural calamities. • Veterinary preparedness with medicines and vaccines.	• Conduction mass animal health camp and treating the effected animals. • Training to livestock owners regarding natural calamities. • Establishment of Co-ordination with other	• Culling sick animals • Availing insurance benefits. • Culling unproductive livestock • Proper disposal of corpse of

	• Vaccination •	Agencies. • Use of mass media to spread expat advice	dead bodies to prevent the spread of contagious diseases.
Cyclone **N.A**	**N.A**	**N.A**	**N.A**
Heat wave and cold wave			
Shelter/environment management	• Avoid use of GI sheet for roofing in the animal shed • Create adequate sources for additional supply of water to protect the animals from heat waves. • Establishment of modern shelter sheds. • As far as possible grow shade trees such as Neem, Pilkhan, Karanj etc near the animal sheds. • Make provision for adequate no. of fans/coolers /heaters according to the situation, if possible	• Provide the thatches/ tarpaulins/ rags in the animal sheds to protect against direct entry of hot/ cold waves • Provide proper bedding to prevent from cold and proper ventilation to prevent from heat. • Provide drinking water to animal frequently during heat wave • Watch the forecast of weather department. • As for as possible the animal should be allowed to wallow in pounds/ canals/ river or give bath once or twice in a day during heat waves	Repair and maintenance of additional facilities
Health and disease management	• Insure the animals • Training to livestock owners/ para-vets regarding preventive measure against extreme weather conditions • Veterinary preparedness with medicines and vaccines etc. • Vaccination against FMD &Cold	• Organize village level animal health camps • Consult veterinary officer immediately if any adverse symptoms are noticed • Use of ITKs for food supplements	• Proper after care of animals. • Availing insurance benefits. • Proper disposal of corpse of dead bodies to prevent the spread of contagious diseases.

[s] based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			Convergence/ linkages with ongoing programs, if any
	Before the event[a]	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	• Making and storage of feed concentrates • Awareness regarding traditional feed banks. • Feed requirement data should be generated • Prepare the feed requirement data base of poultry farm. • Store the feed ingredients	• Use of feed concentrates/ mixture/blocks etc • Establishment of communication with other state agencies. • Use of locally available feed recourses. • Import the feed recourse form other states.	• Availing insurance • Increase the no. of feed banks for future use	
Drinking water	• Making extra facility for drinking water. • Repair & maintenance of water resources	Frequent supply of drinking water		
Health and disease management	• Veterinary preparedness with medicines and vaccines. • Vaccination • Training to poultry Growers regarding natural calamities.	Treatment of affected poultry birds	• Culling of flock • Availing insurance benefits • Proper disposal of corpse of dead bodies to prevent the pared of contagious diseases	
Floods				
Shortage of feed ingredients	Sufficient quantity of feed ingredients should be stored	• Use of stored feed in balanced form	• Cleaning of feed store & repair if any.	

		• Prevent the feed from moisture.	• Moist feed should be dried &treated as per requirement	
Drinking water	Make provision of ground water for drinking	Use only Ground water obtained from India Mrka II or Tubewell	• Repair, maintenance and cleaning of water recourse • Sanitation of open Wells	
Health and disease management	• Veterinary preparedness with medicines and vaccines • Vaccination	• Migration of flock if required • Treatment	• Availing insurance benefits. • Culling of unproductive flock	
Cyclone	NA	NA	NA	
Shortage of feed ingredients	• Storage and making of feed concentrates • Proper feed requirement data base	• Establishment of communication with other state agencies • Use of stored feed ingredient • Import of feed from other areas	Repair and maintenance of feed store	
Drinking water	• Make provision of ground water for drinking	• Use only Ground water obtained from India Mrka II or Tubewell	Repair and maintenance of water recourse	
Health and disease management	• Training to poultry growers regarding natural calamities. • Veterinary preparedness with medicines and vaccines.	Treatment of injured poultry birds.	• Culling of flock • Availing insurance benefits. • Proper disposal of corpse of dead bodies to prevent the pared of contagious diseases.	
Heat wave and cold wave				
Shelter/environment management	• Making sufficient provision of shelter to protect live stock from heat and cold waves • Establishment of alternate resource for water supply. • Modern shelter sheds.	• Keep the birds in appropriate shelter • Provide proper bedding to prevent from cold and proper ventilated to prevent from heat • Provide drinking water to birds frequently. • Adopted proper management	• Making of modern shelter sheds • Increase the plantation of trees	

		practices. • Watch the fore cast of weather department.		
Health and disease management	• Insurance • Veterinary preparedness with medicines and vaccines • Training to poultry growers regarding natural calamities	• Provide proper treatment as per requirement • Treatment of injured poultry	• Availing insurance benefits • Culling of unproductive flock • Proper disposal of corpse of dead bodies to prevent the pared of contagious diseases	•

[a] based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	_	_	_
Inland			
(i) Shallow water depth due to insufficient rains/inflow	• Adopt appropriate measures to reduce water seepage or infiltration	• Harvest the crop partially	• Re stock
(ii) Changes in water quality	• Regular observation to check the water quality and remove the pollutants if any.	• Add oxy-flow to improve oxygen • Churning of pond water	• Maintain appropriate level of water if possible • Check the water quality and remove the pollutants if any.
(iii) Any other	_	_	_
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	• Adopt appropriate measures to reduce water seepage or infiltration from ponds • Avoid any kinds of water pollution and maintain water pH	• Ensure the Oxygen availability into ponds for the survival of fish • Avoid any kind of water pollution • Add oxy-flow to improve oxygen into ponds. • Churning of pond water	• Maintain appropriate level of water in ponds • Check the water quality and remove the pollutants if any.
(ii) Impact of salt load build up in	• Add some fresh water from other	• Add oxy-flow to improve	• Add fresh water into pond for life

ponds / change in water quality	source like cannel etc	oxygen into ponds. • Churning of pond water • Add fresh water into pond for life saving and to reduce salt load	saving and to reduce salt load • Maintain appropriate level of water in ponds • Check the water quality and remove the pollutants if any.
(iii) Any other	_	–	--
2) Floods			
A. Capture			
Marine	--	--	--
Inland			
(i) No. of boats / nets/damaged	• Boats, nets etc should be taken out from water bodies	• Close supervision of flood condition	• Damaged boat or nets should be repaired
(ii) No. of houses damaged	_	_	• Repair the damaged house.
(iii) Loss of stock	_	_	• Sanitation and proper disposal of corpse
(iv) Changes in water quality	• Increase the height of bunds.	--	--
(v) Health and diseases	--	• Treatment if possible	--
B. Aquaculture			
(i) Inundation with flood water	• Repair the bunds to prevent the inflow of water • If inflow water is not polluted then place the net at inlet and outlet • Raise the height of bunds • Plan a proper drainage system at farm • Plantation of soil binding plants at bund	• Avoid inflow of flood water from outside. • If inflow water is not polluted that can be permitted to flow through net placed at inlet and outlet of pond. • Fencing of net required in case of overflow to avoid the migration of fish	• Repair the damaged bunds • Check water quality • Change the water if it is polluted
(ii) Water contamination and changes in water quality	• Limeing @300 kg/ha	• Stop inflow of contaminated water	• Maintain appropriate level of water in ponds • Check the water quality and remove the pollutants if any.
(iii) Health and diseases	• Limeing @300 kg/ha	• Diagnostic measures and provide	• Limeing and medication as per

	• Vaccination	appropriate medicines	requirement • Use Cifex to control ulcerative syndromes
(iv) Loss of stock and inputs (feed, chemicals etc)	• Marketable stock should be sold	• Immediately remove the dead fishes from ponds and do sanitation	• After sanitation add new stock
(v) Infrastructure damage (pumps, aerators, huts etc)	• Damageable infrastructures should be secured	• Do not supply Electricity in floodéd area	• Repaire and service the damage infrastructure
(vi) Any other			
3. Cyclone / Tsunami	NA	NA	NA
A. Capture	--	--	--
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland	--	--	--
B. Aquaculture	--	--	--
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			

Marine	--	--	--
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)	• Maintain appropriate level of water in ponds *i.e.* 1.75m in 2m deep ponds • Check the water quality and remove the pollutants if any	• Maintain appropriate level of water in ponds *i.e.* 1.75m in 2m deep ponds • Check the water quality and remove the pollutants if any	• Maintain appropriate level of water in ponds *i.e.* 1.75m in 2m deep ponds • Check the water quality and remove the pollutants if any
i) Health and Disease management	• Limeing@300kg/ha	• Medication as per requirement	• Remove the dead fishes from ponds and add new stocks to compensate • the production
(ii) Any other			

[a] based on forewarning wherever availablle