State: Uttar Pradesh

Agriculture Contingency Plan for District: Bagpat District

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Northern Plain (And Central Highlands) Including Aravallis, Hot Semi-Arid Eco-Region (4.1)			
	Agro-Climatic Zone (Planning Commission)	Upper Gangatic Plain Zone(V)			
	Agro Climatic Zone (NARP)	Western Plain Zone (UP-3)			
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Muzaffarnagar, Meerut, Gaziyabad, G.B.Nagar and Bulandshahr.			
	Geographic coordinates of district headquarters				
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		29^0 0’ 48.205” N	77^0 18’42.532”E	222 Mt	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	No			
	Mention the KVK located in the district with address	K.V.K., New Khakra Tahsil Ke Pechhe Bagpat of S.V.P.U.A&T, Meerut.			
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	S.V.P. University Meerut / IARI New Delhi			

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):	598.7	42	3rd week of June	2nd week of September
	NE Monsoon(Oct-Dec):	31.5	12	3rd week of December	2nd week of January
	Winter (Jan- March)	66.2	15	-	-
	Summer (Apr-May)	23.8	7	-	-
	Annual	720.2	76	-	-

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)	134.994	109.816	1.525	15.916	0.092	2.008	0.074	2.355	2.284	0.924

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	Sandy loam	74.22	67.58
	Loam	24.43	22.25
	Clay loam	6.95	6.33
	Silt loam	4.513	4.11
	Others (specify):		

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	108.941	157.38%
	Area sown more than once	63.010	

	Gross cropped area	172.826	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	105.493		
	Gross irrigated area	172.526		
	Rainfed area	3.448		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		2.792	2.6%
	Tanks		0	_
	Open wells		0.198	0.19%
	Bore wells		102.503	96.58%
	Lift irrigation schemes	NIL	_	_
	Micro-irrigation		0.122	0.11
	Other sources (please specify)		0	
	Total Irrigated Area		105.615	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils Block-6	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	1	-	Not reported
	Critical	2	-	do
	Semi- critical	2	-	do
	Safe	1	-	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	_	_	3.646	_	_	3.646	_	3.646
	Wheat	_	_	_	_	_	56.176	_	56.176
	Sugarcane	_	_	_	_	_	56.758	_	56.758
	Mustard	_	_	_	_	1.306	1.306	_	1.306
	Toria	_	_	_	2.000	_	2.000	_	2.000
	Pigeonpea	_	0.123	0.123	_	_	_	_	0.123

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	All Fruits Crops(Mango+Guava)	8.432 ha	_	8.732
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	Potato	0.503 ha	0.503	_
	Other Vegetable Crops	32.753 ha	27.253	5.5
	Medicinal and Aromatic crops	Total	Irrigated	Rainfed
	Flowers(Marigold+Gladiolus)	0.160	0.160	_
	Plantation crops	Total	Irrigated	Rainfed
	Eucalyptus	0.015	_	0.015
	Poplar	0.098	0.098	-
	Eg., industrial pulpwood crops etc.			
	Fodder crops	**Total**	**Irrigated**	**Rainfed**
	Sorghum	47.135	21.246	25.888
	Berseem	3.465	3.465	_
	Pearl millet/Maize	1.216	0.562	0.654
	Total fodder crop area	51.815	25.273	26.542
	Grazing land	0.046		
	Sericulture etc			
	Others (specify)			

1.8	**Livestock**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	9.325	70.370	79.695
	Improved cattle	NA	NA	NA
1.9	Crossbred cattle	8.641	33.844	42.485
	Non descriptive Buffaloes (local low yielding)	67.264	255.078	322.343
	Descript Buffaloes	28.827	109.319	138.147
	Goat	4.326	10.883	15.209
	Sheep(India+Exotic)	1.099	3.016	4.115
	Others (Camel, Pig, Yak etc.)			467.616
	Commercial dairy farms (Number)			
	Poultry	**No. of farms**	**Total No. of birds (‘000)**	
	Commercial	01	4.000	
	Backyard		4.317+6.159=10.476	

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**
	-	-	673

B. Culture

	Water Spread Area (ha)	**Yield (t/ha)**	**Production (‘000 tons)**
i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	-	-	–
ii) **Fresh water** (Village tanks) (Data Source: Fisheries Department)	667.78 ha	–	–
Others			

1.11 Production and Productivity of major crops (2008-09)

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	9.906	2717	_	_	_	_	9.906	0.27	6.182
	Wheat	_	_	213.244	3796	_	_	213.244	3796	262.290
	Sugarcane	_	_	_	_	_	_	3233.684	56793	517.280
	Mustard	_	_	1.443	1105	_	_	1.443	1105	_
	Toria	_	_	1.937	969	_	_	1.937	969	_
	Others									
Major Horticultural crops (Crops to be identified based on total acreage)										
	All Fruits	-	-	-	-	-	-	150.800	1727	
	All Vegetables	-	-	-	-	-	-	371.800	1135	
	Potato	-	-	-	-	-	-	130.000	25845	
	Flowers	-	-	-	-	-	-	0.715	446.8	
	Others									

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

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought	x	√	x

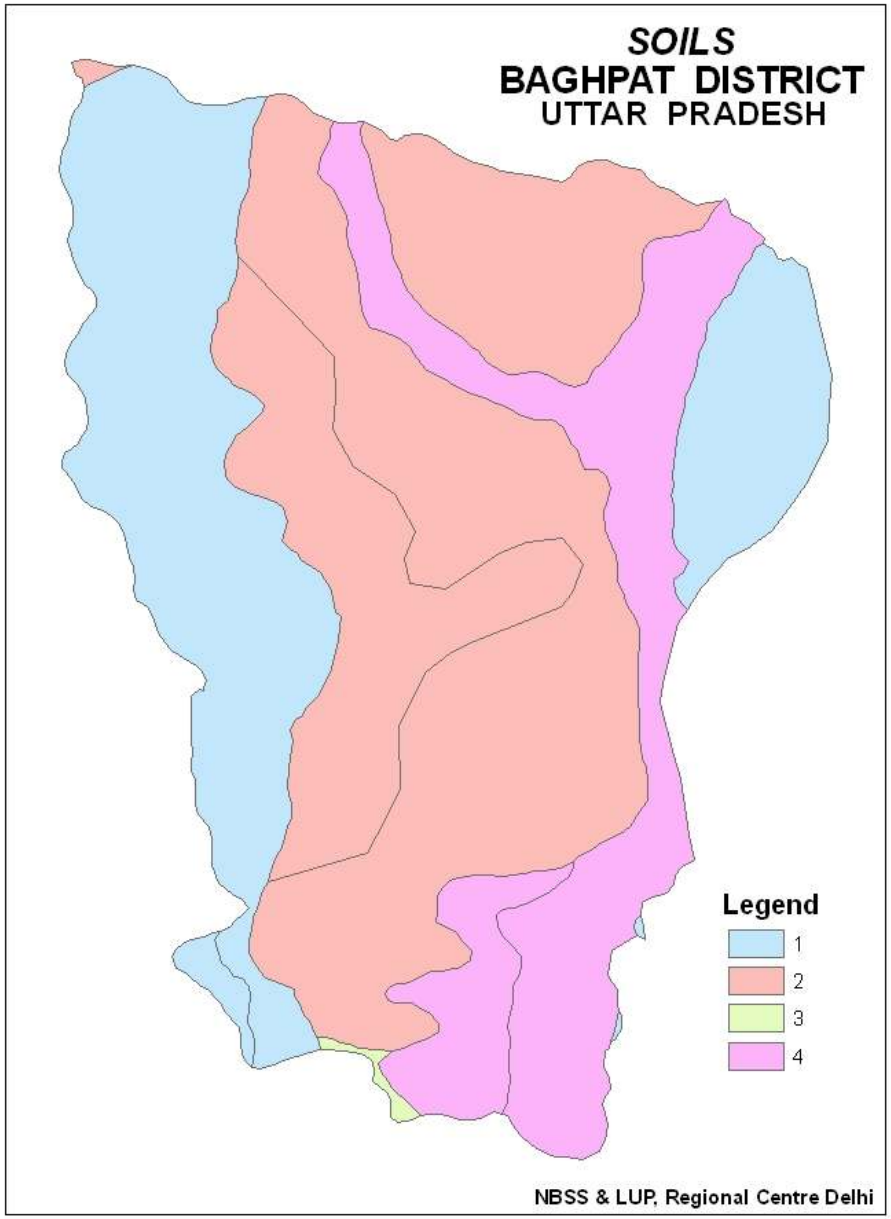
	Flood	x	X	√
	Cyclone	x	X	√
	Hail storm	x	X	√
	Heat wave	x	√	X
	Cold wave	x	√	X
	Frost	x	√	X
	Sea water intrusion	x	x	√
	Pests and disease outbreak (specify)Pyrilla,Grass hopper, Heleothis, shoot borer, white grub etc.	√	x	x
	Others (specify) Fog	√	x	x

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


BAGHPAT
District Map
To Shamli
N
Muzaffar Nagar
DELHI
Chharprauli
Tikri
Kishanpur
Asimpur kheri
www.mapsofindia.com
Kotana
Baraut
Binauli
Sarurpur
Yamuna
Sujra
Daula
BAGHPAT
Khekra
Meerut
Ghaziabad
LEGEND
State Boundary
District Boundary
Major Road
Railway
District Headquarter
Other Town
River
Map not to Scale
Copyright © 2007 Compare Infobase Limited

Soil map



Legend	Description
1	Deep, loamy soils
2	Deep, loamy soils and silty soils
3	Deep, fine (moderately saline and sodic) soils and loamy soils
4	Deep, loamy soils and loamy soils

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

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	• Seed through KSSC and NFSM • Adequate supply of

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]**
		Sorghum(Fodder)-Wheat	Pearl millet –Wheat Pearl millet (fodder): WCC-75, Raj-171, Pusa-23, Pusa-322	rice • Alternate Furrow irrigation • Mulching in sugarcane	electricity/diesel should be ensured by the government agencies.
		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 by the Govt agencies.
		Sorghum(Fodder)-Wheat	No change required		
		Sugarcane-Ratoon-Wheat	No change required		
Non release of water in canals under delayed onset	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		

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]**
of monsoon in catchment		Sugarcane +cucurbits	Sugarcane	• 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:	**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/Arabic Rice /Vegetable (Tomato, Brinjal, cucrbits etc)	• Limited irrigation • Alternate Furrow irrigation • Drip irrigation • Mulching	• Seed through KSSC and NFSM • Harvesting and threshing implements through RKVY
		Sorghum/Maize	Bajara /Arhar/Urd		
		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]**
	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)	Pearl millet /Sorghum (Fodder)		
		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 off 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 & 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 • Re transplanting	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as early 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	Provide drainage	Provide drainage	Shift to safer place & dispose of produce as

	bed • Re transplanting			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				

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

Extreme event type	**Suggested contingency measure**[r]			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]				
Rice basmati	• Re sowing of nursery • Light and frequent irrigation during night	Irrigation interval should be decreased	Irrigation interval should be decreased	Light and frequent irrigation
Sugarcane	• Mulching	Irrigation interval should be decreased	Irrigation interval should be decreased	Light and frequent irrigation
Sorghum (fodder)	• Re sowing	Irrigation interval should be decreased	Irrigation interval should be decreased	Make silage

Blackgram / Greengram	• Re sowing • Mulching	Light irrigation for survival	Light irrigation for survival	Pod picking
Pigeonpea	• Re sowing • Mulching	Light irrigation for survival	Light irrigation for survival	Pod picking
Horticulture				
Okra	• Re sowing of nursery • Re transplanting • Mulching • Light watering during night	Light irrigation for survival	Light irrigation for survival	Harvesting of fruits
Brinjal	• Re sowing of nursery • Re transplanting • Mulching • Light watering during night	Light irrigation for survival	Light irrigation for survival	Harvesting of fruits
Tomato	• Re sowing of nursery • Re transplanting • Mulching of nursery beds • Light irrigation during night	Light irrigation for survival	Light irrigation for survival	Harvesting of fruits
Mango	• Spray of water	Spray of water	Spray of water	-
Guava	• Spray of water	Spray of water	Spray of water	-
Cold wave[q]				
Wheat	Light irrigation	Light irrigation	Light irrigation	Light irrigation
Sugarcane	Mulching	Light irrigation for survival	--	Harvesting of cane
Horticulture				
Tomato	Grow some inter crop	Light Sprinkler irrigation	Light Sprinkler irrigation	Harvesting of fruits
Pea	Grow some inter crop	Light Sprinkler irrigation	Light Sprinkler irrigation	Harvesting of fruits
Potato	Grow some inter crop	Light Sprinkler irrigation	--	Harvesting

Frost				
Sugarcane	Light irrigation	Light irrigation	Light irrigation	Harvesting of cane
Pigeonpea	Grow as inter crop Smoke at night	Light irrigation Smoke at night	Light irrigation Smoke at night	Smoke at night
Horticulture				
Potato	• Light irrigation for survival • Smoke at night	• Light irrigation for survival • Smoke at night	• Light irrigation for survival • Smoke at night	Harvesting
Tomato	• Light irrigation for survival • Smoke at night	• Light irrigation for survival • Smoke at night	• Light irrigation for survival • Smoke at night	De halming
Pea	• Light irrigation for survival • Smoke at night	• Light irrigation for survival • Smoke at night	• Light irrigation for survival • Smoke at night	Harvesting
Mango	• Irrigation &Smoking during night	• Irrigation &Smoking during night	• Irrigation &Smoking during night	--
Guava	• Irrigation &Smoking during night	• Irrigation &Smoking during night	• Irrigation &Smoking during night	Harvesting
Hailstorm				
Crop1:All the crops	Re sowing	Re sowing of Catch crop	Harvest for fodder	Pre Harvesting
Horticulture				
Crop1:All the Vegetable crops	Re sowing	Re sowing of Catch crop	Harvest for fodder	Pre Harvesting
Crop2:All the Fruit crops	• Use anti hail net • Spray of fungicide with 2% urea solution	• Use anti hail net • Spray of fungicide with 2% urea solution	• Use anti hail net • Spray of fungicide with 2% urea solution	• Harvest the damaged fruits • Spray of fungicide with 2% urea solution
Fog				
Sugarcane				
Pigeonpea				
Wheat				

Horticulture				
Potato				
Cauliflower				
Tomato				

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 deptt. • 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 no. 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 management	• Farmers should be encouraged to avail Livestock insurance • Training to livestock owners regarding natural calamities. • Veterinary preparedness with medicines and vaccines. • Vaccination	• Conduction mass animal health camps and treating the effected animals. • Mass campaigning though different media regarding possible outbreak of diseases and their management.	• Availing insurance benefits. • 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.	• 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

	• 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.		
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 magnate.
Health and disease management	• Live stock Insurance • Training to livestock owners regarding natural calamities. • Veterinary preparedness with medicines and vaccines. • Vaccination •	• Conduction mass animal health camp and treating the effected animals. • Training to livestock owners regarding natural calamities. • Establishment of Co-ordination with other Agencies. • Use of mass media to spread expat advice • .	• Culling sick animals • Availing insurance benefits. • Culling unproductive livestock • Proper disposal of corpse of 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.

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 • Prevent the feed from moisture.	• Cleaning of feed store & repair if any. • 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 Tube well	• 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	• Treatment of injured poultry birds.	• Culling of flock • Availing insurance benefits.	

	medicines and vaccines.		• 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 practices. • Watch the fore cast of weather department.	• Making of modern shelter sheds • Increase the plantation of trees	
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	•

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 ponds / change in water quality	• Add some fresh water from other source like cannel etc	• Add oxy-flow to improve oxygen into ponds. • Churning of pond water • Add fresh water into pond for life saving and to reduce salt load	• Add fresh water into pond for life 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	• Liming @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	• Liming @300 kg/ha • Vaccination	• Diagnostic measures and provide appropriate medicines	• Liming and medication as per 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 Electric in floodéd area	• Repair 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 *ie.* 1.75m in 2m deep ponds • Check the water quality and	• Maintain appropriate level of water in ponds *ie.* 1.75m in 2m deep ponds • Check the water quality and	• Maintain appropriate level of water in ponds *ie.* 1.75m in 2m deep ponds • Check the water quality and

	remove the pollutants if any	remove the pollutants if any	remove the pollutants if any
i) Health and Disease management	• Liming@300kg/ha	• Medication as per requirement	• Remove the dead fishes from ponds and add new stocks to compensate • the production

based on forewarning wherever available