State: GUJARAT

Agriculture Contingency Plan for District: TAPI

1.0 District Agriculture profile						
1.1	Agro-Climatic/Ecological Zone					
	Agro Ecological Sub Region (ICAR)	Central (Malva) Highlands, Gujarat Plains and Kathiawar, Peninsula Ecoregion (5.2)				
	Agro-Climatic Zone (Planning Commission)	Gujarat plains and hills region (XIII)				
	Agro Climatic Zone (NARP)	South Gujarat Heavy Rainfall Zone		(GJ-1), South Gujarat zone (GJ-2)		
	List all the districts or part thereof falling under the NARP Zone	Navsari, Valsad, Dangs Tapi				
	Geographic coordinates of district headquarters	Latitude		Longitude		Altitude
		21° 11' 31.56 " N		72° 48' 18.15"E		10.66 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Rice Research Station,Vyara-394 650,Dist-Tapi				
		Navsari Agricultural University, Navsari				
	Mention the KVK located in the district	Krishi Vigyan Kendra, NAU., Vyara-394 650,Dist-Tapi				
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):	1536	58	3rd week of June	4th week of September	
	NE Monsoon(Oct-Dec):	------		-	-	
	Winter (Jan- March)	-------		-	-	
	Summer (Apr-May)	--------		-	-	
	Annual	1536	58	-	-	

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)	3434.64 Sq. km	347.51	74.025	48.50	8.98	3.43	2.188	45.65	0.611	0.014

(Source :District Panchayat reports, reports of Agriculture department)

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)*	Area (‘000 ha)	Percent (%) of total
	Plain Area- Heavy black soils	208.78	60.78
	Hilly Area- Light soil (lateritic and eroded shallow and Clay loam moderately deep shallow soil	138.73	39.92

1.5	Agricultural land use	Area (‘000 ha)	Cropping intensity %
	Net sown area	347.51	133
	Area sown more than once	115.5	
	Gross cropped area	463.01	

1.6	Irrigation	Area (‘000 ha)		
	Net irrigated area	63.496		
	Gross irrigated area	115.5		
	Rain fed area	232.01		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	3	26.642	42
	Tanks	458	--	--
	Open wells	15654	24.121	38
	Bore wells	15651		
	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (please specify) Lift irrigation schemes, Bore wells, Micro irrigation		12.733	20
	Total Irrigated Area	-	63.496	100.0
	Pump sets	14546	-	-
	No. of Tractors	8746	-	-
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	-	-	-
	Critical	-	-	-
	Semi- critical	-	-	-
	Safe	Yes	-	-
	Wastewater availability and use	-	-	-
	Ground water quality			

(Source :District Panchayat reports, reports of Agriculture department)

1.7 Area under major field crops & horticulture (as per latest figures)(Average of last six years)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			Rabi				
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total	Summer	Grand total
	Paddy	29.22	23.74	52.96	-	-	-	- -	52.96
	Jowar	1.260	-	1.260	2.740		2.740	-	-
	Sugarcane	-	-	-	22.93	-	22.93	- -	22.93
	Groundnut	1.465		1.465				19.0	20.127
	Cotton	2.586	5.045	7.631	-	- -	-	- -	7.631

	Horticultural crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rain fed
	Mango	5.070	5.070	
	Sapota	0.085	0.085	
	Banana	1.625	1.625	
	Papaya	1.927	1.927	
	Custard apple	0.041		0.041
	Horticultural crops - Vegetables	Total		
	Okra	8.985		
	Brinjal	3.637		
	Onion	0.176		
	Tomato	0.659		
	Cucurbits	3.268		

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	--	-	132.400
	Crossbred cattle	--	-	183.400
	Non descriptive Buffaloes (local low yielding)	-	-	343.200
	Graded Buffaloes			
	Goat	-	-	181.100
	Sheep	-	-	--
	Others (Camel, Pig, Yak etc.)	-	-	-
	Commercial dairy farms (Number)	-	-	-
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	45	456.600	
	Backyard	21	207.810	

1.10	Fisheries (Data source: Chief Planning Officer)						
	8) 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	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		---		----		-----	
	B. Culture	Not applicable					

	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	--	--	--

(Source :District Panchayat reports, reports of Agriculture department)

1.11 Production and Productivity of major crops (Average of last 5 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)										
	Paddy	8290	2640			1560	2860	9850	2750	17268.75
	Jowar	17059	1331.2	25484	1666.8			42543	1499	136137.6
	Sugarcane			1342.07	75754			1342.07	75754	
	Groundnut	2298	1560			1350	1919	3648	1739.5	18233
	Cotton	2415	1684.5					2415	1684.5	
	Pigeon Pea	15242	920.4					15242	920.4	
	Soyaben	8708	1200.0					8708	1200.0	
	Black Gram	1185	510					1185	510	
	Wheat			14893	3136.2			14893	3136.2	35743.68
	Gram			2711.2	1162.74			2711.2	1162.74	5693.52
Major Horticultural crops (Crops to be identified based on total acreage)										
Others	Mango	-	-	-	-	70.1	8200	70.1	8200	-
	Sapota	-	-	-	-	19.9	10000	19.9	10000	-
	Banana	-	-	763.8	65000	-	-	763.8	65000	-
	Papaya	-	-	8.7	6000	-	-	8.7	6000	-
	Custard apple	-	-	-	-	0.075	1500	0.075	1500	-

Major Vegetable crops (Crops to be identified based on total acreage)										
	Okra			117.369	13.06			117.369	13.06	
	Brinjal	3.637	67.696					3.637	67.696	
	Onion			5.470	31.11			5.470	31.11	
	Tomato			14.834	22.51			14.834	22.51	
	Cucurbits			60.109	18.39			60.109	18.39	

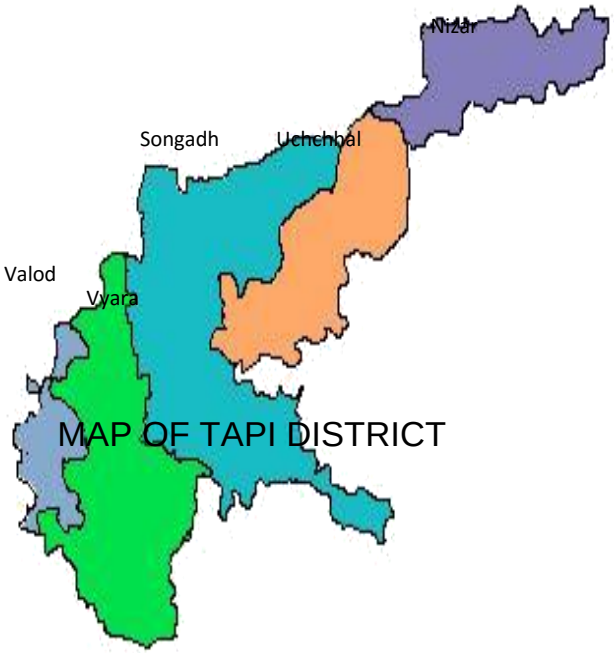
1.12	**Sowing window for 5 major crops**	Paddy	Sorghum(grain	Sugarcane	Groundnut	Cotton
	Kharif- Rain fed	2 nd week of June to 2 nd week of July	2 nd week of June to 2 nd week of July	-	-	2 nd week of June to 2 nd week of July
	Kharif-Irrigated	2 nd week of June to 2 nd week of July	2 nd week of June to 2 nd week of July	-	-	2 nd week of June to 2 nd week of July
	Rabi- Rain fed	-	-	-	-	-
	Rabi-Irrigated	-	-	1st week of October to 4th week of January.	1st week of January to 2nd week of February.	-

1.13	**What is the major contingency the district is prone to?** (Tick mark and mention years if known during the last 10 year period)	**Regular**	**Occasional**	**None**
	Drought			√
	Flood			√
	Cyclone			√
	Hail storm			√

	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water inundation			√
	Pests and diseases (specify) (specify the pests and diseases in the major crops)		√	

(Source :District Panchayat reports, reports of Agriculture department)

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 Yes
		Soil map as Annexure 3	Enclosed: Not



Location map of district within State as Annexure I

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rain fed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 2 weeks I st week of July	Moderately deep black & sandy loam soil (Plain area)	Paddy	No Change	Intercultivation, Protected Irrigation and weed management. Alternate method of rice cultivation	Linkage with RKVY, NSC and NFSM
		Sorghum	No Change		
		Sugarcane	No Change		
		Groundnut	No Change		
		Cotton	No Change		

	Sandy loam soil (Hilly area)	Paddy	No Change		
		Sorghum	No Change		
		Sugarcane	No Change		
		Groundnut	No Change		
		Cotton	No Change		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks 3 rd week of July	Moderately deep black & sandy loam soil (Plain area)	Paddy	No Change	Alternate method of rice cultivation Micro irrigation - Inter cultivation -	Linkage with GSSC NSC RKVY NHM
		Sorghum	No Change		
		Sugarcane	No Change		
		Groundnut	No Change		
		Cotton	No Change		
	Sandy loam soil (Hilly area)	Paddy	No Change	20 % Higher seed rate Higher fertilizer Moisture conservation Insect Pest Resistant Variety	
		Sorghum	No Change		
		Sugarcane	No Change		
		Groundnut	No Change		
		Cotton	No Change		

Condition					
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks Ist week of August	Moderately deep black & sandy loam soil (Plain area) Sandy loam soil (Hilly area)	As above	- Use early maturing variety based on specific area Use Jowar + pulse cropping system Paddy + pulse cropping system -	Sprouted Paddy cultivation SRI technology Use mixed cropping Use life saving irrigation at critical stages Arobic rice cultivation Use drip and sprinkler irrigation	

Condition	Situation does not arise				
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 8 weeks 3rd week of August		As above	Use early maturing variety based on specific area Use Jowar + pulse cropping system Paddy + pulse cropping system	Sprouted Paddy cultivation SRI technology Use mixed cropping Use life saving irrigation at critical stages Arobic rice cultivation Use drip and sprinkler irrigation	

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	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.	Moderately deep black & sandy loam soil (Plain area)	Paddy Sorghum Sugarcane Groundnut	Gap filling Thinning Give protective irrigation	Adopt foliar sprays of nutrients Adopt Minimum Tillage Technology	Linkage with RKVY, NSC and NFSM

		Cotton			
	Sandy loam soil (Hilly area)	Paddy	Gap filling Thinning Give protective irrigation	Adopt foliar sprays of nutrients Adopt Integrated Nutrient Management	
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
At vegetative stage	Moderately deep black & sandy loam soil (Plain area)	Paddy	Use antitranspirant chemical Give protective irrigation Repeated intercultivation Weed management	Use plastic or grass mulch. Application of foliar nutrients Give protective irrigation	Linkage with RKVY, NSC and NFSM
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			
	Sandy loam soil (Hilly area)	Paddy	Use antitranspirant chemical Give protective irrigation Repeated intercultivation Weed management	Use plastic or grass mulch. Application of foliar nutrients. Give protective irrigation	Linkage with RKVY NSC and NFSM
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Moderately deep black & sandy loam soil (Plain area)	Paddy	Give protective irrigation Adopt Integrated Nutrient Management Practices	Adopt foliar application of nutrients at flowering stage Use plastic or grass mulch.	Linkage with RKVY, NSC and NFSM
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			
	Sandy loam soil (Hilly area)	Paddy	Give protective irrigation Adopt Integrated Nutrient Management Practices	Adopt foliar application of nutrients at flowering stage Use plastic or grass mulch.	Linkage with RKVY, NSC and NFSM
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Moderately deep black & sandy loam soil (Plain area)	Paddy	Harvest at physiological maturity stage Give protective irrigation	Adopt foliar application of nutrients Life saving irrigation Relay cropping system	Linkage with RKVY, NSC and NFSM
		Sorghum			
		Sugarcane			
		Groundnut			

		Cotton			
	Sandy loam soil (Hilly area)	Paddy	Harvest at physiological maturity stage	Adopt foliar application of nutrients	Linkage with RKVY, NSC and NFSM
		Sorghum Sugarcane Groundnut Cotton	Give protective irrigation		

2.1.2 Drought - Irrigated situation:

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Moderately deep black & sandy loam soil (Plain area) Sandy loam soil (Hilly area)	Paddy / Pigeon pea	Short duration pulses crop namely Green gram, Black gram and late Pigeon pea	Short duration Variety and Life Saving irrigation	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Moderately deep black & sandy loam soil (Plain area)	Sugarcane	Pappdi and Pigeon pea for vegetable purpose	Select early mature variety	
	Sandy loam soil (Hilly area)	--	-	-	-

Condition					
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Moderately deep black & sandy loam soil (Plain area)	Paddy, sugarcane, Pulses	Paddy and Pulses	Preferred traditional variety of paddy and pulsed also Adopt millet	
	Sandy loam soil (Hilly area)	Pulses	Pulses traditional variety	Millets and traditional pulses	

Condition					
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Moderately deep black & sandy loam soil (Plain area)	Paddy / Pigeon pea	Short duration pulses crop namely Green gram, Black gram and late Pigeon pea	Short duration Variety and Life Saving irrigation	
	Sandy loam soil (Hilly area)	Drilled paddy / Pigeon pea	Traditional variety of pulses and millet	Short duration pulses crop namely Green gram, Black gram and late Pigeon pea	Short duration Variety and Life Saving irrigation

Condition	This is not expected in this district				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Moderately deep black & sandy loam soil (Plain area)	Paddy and vegetables	Short duration pulses crop namely Green gram, Black gram and late Pigeon pea	Short duration Variety and Life Saving irrigation	
	Sandy loam soil				

	(Hilly area)	Drilled paddy / Pigeon pea	Traditional variety of pulses and millet	Short duration pulses crop namely Green gram, Black gram and late Pigeon pea	Short duration Variety and Life Saving irrigation

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Paddy	Resowing Provide drainage	Provide drainage	Plan for rabi crop	Shift to safer place
Sorghum	Resowing Provide drainage	Provide drainage	Plan for rabi crop	Shift to safer place
Sugarcane	Resowing Provide drainage	Provide drainage	-	Shift to safer place
Groundnut	Resowing Provide drainage	Provide drainage	Plan for rabi crop	Shift to safer place
Cotton	Resowing Provide drainage	Provide drainage	Plan for rabi crop	Shift to safer place
Horticulture				
Mango	Provide drainage	Provide drainage	Provide drainage	Shift to safe place dry in shade and turn frequently
Sapota	Provide drainage	Provide drainage	Provide drainage	Shift to safe place dry in shade and turn frequently
Banana	Provide drainage	Provide drainage	Provide drainage	Shift to safe place dry in shade and turn frequently
Papaya	Provide drainage	Provide drainage	Provide drainage	Shift to safe place dry in shade and turn frequently
Custard apple	Provide drainage	Provide drainage	Provide drainage	Shift to safe place dry in shade and turn frequently
Heavy rainfall with high speed winds in a short span				
Paddy	Resowing, Gap filling	Use lodging resistant variety	Plan for rabi crop	Shift to safe place

	Provide drainage			dry in shade and turn frequently
Sorghum	Resowing, Gap filling Provide drainage	Use lodging resistant variety	Plan for rabi crop	
Sugarcane	Provide drainage	Use lodging resistant variety	-	
Groundnut	Resowing, Gap filling Provide drainage	Use lodging resistant variety	Plan for rabi crop	
Cotton	Resowing, Gap filling Provide drainage	Use lodging resistant variety	Plan for rabi crop	
Horticulture				
Outbreak of pests and diseases due to unseasonal rains	Give crop wise pest & disease management in detail			
Paddy	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Sorghum	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Sugarcane	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Groundnut	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Cotton	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Horticulture rops				
Mango	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Sapota	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Banana	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Papaya	Need based plant protection IPDM	Need based plant protection IPDM	Harvest at physiological maturity stage	Need based plant protection IPDM
Custard apple	Need based plant	Need based plant protection	Harvest at	Need based plant

	protection IPDM	IPDM	physiological maturity stage	protection IPDM	
2.3 Floods :					

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

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	--	-- -	--	--
Horticulture				
Cold wave				
Horticulture				
Frost				
Horticulture				

Hailstorm
Horticulture
Cyclone
Horticulture

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingent measures		
Drought	**Before the event**	**During the event**	**After the event**
Feed and fodder availability	• Insurance • Encourage perennial fodder on bunds and waste land on community basis • Establishing fodder banks, • Encouraging fodder crop in irrigated area • Silage-using excess fodder for silage	• Utilization of perennial tree and fodder bank reserves • Utilizing stored silos • Transporting excess fodder from adjoining districts • Use of feed mixture	• Availing insurance • Culling unproductive livestock
Drinking waters	• Preserving water in the tank for drinking purpose • Excavation of bore wells	• Using preserved water in the tanks for drinking wherever ground water resources are available priority for drinking purpose	
Health and disease management	Veterinary preparedness with medicines and vaccine	• Mass animal heath camp and treatment of affected animals once in campaign	• Culling of sick animals
Floods			
Feed fodder availability	• Feeds and fodder should be transported to adjoining well protected areas. • Village or Taluka level feed and fodder bank with facilities like TMR machine/ feed block machine should be developed. • Prepare balanced feed formulations using available feed resources.	• Transportation of fodder especially dry fodder should be done to affected area. • Use of Total Mixed Ration (TMR)/ feed block should be encouraged. • Use of unconventional feed like tree leaves etc. in ration may be incorporated.	• Culling of unproductive animals
Drinking Water	• Preserving water in water tank for drinking purpose.	• Using preserved water for drinking • Avoid wastage of water	• Repair damaged water sources like tank, pond, wells etc.

Health and disease management	• Veterinary preparedness with medicines and vaccine • Availing Insurance of animals and farm equipments	• Mass animal heath camp and treatment of animals • Ring vaccinations like FMD, HS should be conducted.	• Culling of sick animals • **Proper burial of carcass using disinfection**
Cyclone			
Feed and fodder availability	• Feed and fodder should transport to safe area. • Use of curtails to avoid splashing of water in feed storage • Prepare balanced feed formulations using available feed resource	• Keep fodder in closed area so it does not get wasted. • Use of **toxin binders in feed**	• Use balanced ration to restore normal production. • Use feed additives like probiotics, prebiotics, enzymes etc. to encourage overall health status.
Drinking water	• Keep eye on water sources/stock	• Use of electrolyte/ coccidiostats/ antidiarrhoeal in water	• Repair damaged water resources.
Health and disease management	• Veterinary preparedness with medicines and vaccine • Insurance of animals	• Isolate affected animals	• Proper burial of carcass using disinfection
Heat wave and cold wave			
Shelter and environment management (**For heat wave)**	• Install foggers/sprinklers in house having timer to avoid overuse of water • Tree plantation on both the side of shed • Keep drinking water available whenever needed and use electrolytes in water.	• Use of silage feeding encouraged. • Increase feeding frequency and feeding during night hours • Use of water bodies like pond for wallowing of animals • Increase energy density of diet by incorporating **bypass fat.**	• Use of cooling mechanisms to maintain house temperature on comfort zone for better production.
Shelter and environment management **(For cold wave)**	• Keep calf below 1 year age in separate shed that protects animals from direct cold.	• Use of bedding materials like paddy straw should be done for Calves. • Use of lamp/bulb to increase the temperature of shed during night hours. • Increase use of dry fodder and urea treated straw.	.
Health and disease management	• Veterinary preparedness with medicines	• Use of electrolytes in drinking water	Isolate affected animals and give special concern

2.5.2 Poultry

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	• Purchase sufficient quantity of ready feed /raw feed ingredients as per storage facilitiesand requirement. • Indentify and test available alternative lowcost feed resources in feed testinglaboratories for their exact composition forformulating balanced feed. • Prepare balanced feed formulation usingavailable feed resources. • Create alternative power generating facilitiesi.e. Generator set. Take insurance of poultry sheds, equipmentsand feed factory well in advance may be inthe starting phase of opening the farm.	• Feed formulations using low costfeed ingredients in case of non-availability of high pricedconventional ingredients. • Keep check on productionperformance and modify ration consulting poultry specialist. • Nutrient density should beincreased in proportion to feedconsumption. • Avoid feed wastage	• Shift over to good quality feed foroptimum production performance.
Drinking water	-	-	-
Health and disease management	• Use of anti-stress vitamins (AD_3ECB_{12}-Vimeral / Famitone / Stressvell etc.) in feed and drinking water. • Use of adaptogenetic herbal medicines (Zetress / Zist etc). • Use probiotics (Protexin / Biovet-YC) in feed. • Vaccinate birds against important diseases like R.D., IBD, I.B., Fowl pox according to age as per scheduled programme.	• Use anti-stress, vitamins and adaptogenetic herbal drugs. • Perform vaccination for Ranikhet Disease & Infectious Bronchitis . • Prophylactic medication for important diseases like E.coli & CRD. • Use of electrolytes in feed and drinking water.	• Vaccinate birds as per vaccination schedule. • Perform deworming with Levamisole / Albendazole / Piperazine etc) and use antibiotics, vitamins as per monthly health calendar programme
Floods			
Shortage of feed ingredients	• Purchase sufficient quantities of ready feed / raw feed ingredients. • Store feeding material in suitable houses which should be leak proof and without dampness. • Store feed on iron stands away from the wall	• Use of toxin binders (Chek–O-Tox/ UTPP etc.) in the feed. • All electric connections should be in good condition to avoid shock and accident.	• Use of Toxin binder should be continued to avoid development of mycotoxins in the feed

	to avoid increase in moisture & mould growth. • Road repairing for transporting feed and farm products. • Take insurance of poultry sheds, equipments, feed factory and mortality of birds due to drowning in flood water well in advance may be in the starting phase of opening the farm.		
Drinking water	-	-	-
Health and disease management	• Complete vaccination as per the programme for various categories of the birds i.e. Layers & Broilers. • Poultry sheds should be constructed at high raised land/or go for raised platform poultry sheds especially in flood affected areas. (conceptional biosecurity)	• Use of probiotics / or antibiotics in feed to protect birds from bacterial infections like E.coli, CRD, Enteritis etc.	• Use of probiotics should be continued in feed for 10-15 days.
Cyclone	Not Observed		
Shortage of feed ingredients			
Drinking water			
Health and disease management			
Heat wave and cold wave	Not Observed		
Shelter/environment management			
Health and disease management			

management				
Health and disease management				

2.5.3 Fisheries/ Aquaculture: Not observed

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought	-		
A. Capture	-		
Marine	-	-	
Inland	-		
(i) Shallow water depth due to insufficient rains/ inflow	-	-	-
(ii) Changes in water quality	-	-	-
(iii) Any other	-	-	-
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/ inflow	-	-	-
(ii) Impact of salt load build up in ponds / change in water quality	-	-	-
(iii) Any other	-	-	-
2) Floods	-		
A. Capture	-		
Marine	-	-	-
Inland	-	-	-
B. Aquaculture	-		
3. Cyclone / Tsunami			
A. Capture			

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Marine	-		
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)	-	-	-
(ii) Health and Disease management	-	-	-
(iii) Any other	-	-	-