State: GUJARAT

Agriculture Contingency Plan for District: VALSAD

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Western Ghats And Coastal Plain, Hot Humi-per humid eco region (19): North Sahyadris and Konkan Coast, hot, humid eco-subregion(19.1)			
	Agro-Climatic Zone (Planning Commission)	Gujarat plains and hills region (XIII)			
	Agro Climatic Zone (NARP)	South Gujarat Heavy Rainfall area (GJ-1)			
	List all the districts or part thereof falling under the NARP Zone	Navsari, Valsad, Dang, Tapi			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		20° 36' 37.40" N	**72° 55' 32.93" E**	**19 m**	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Navsari Agricultural University, Navsari.			
	Mention the KVK located in the district	KVK, Ambheti (NGO) ,Taluka-Kaprada,Dist-Valsad			
1.2	**Rainfall (Year:2009)**	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	2350	63	June 3rd week	Sept 4th week
	NE Monsoon(Oct-Dec):	-		-	-
	Winter (Jan- March)	-	-	-	-
	Summer (Apr-May)	-	-	-	-
	Annual	2350	63	-	-

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

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)	294.4	165.3	87.6	17.5	2.3	7.6	7.5	4.5	11.4	1.7

(Source :District Panchayat reports,C-DAP2012, PLP NABARD-2016-17)

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)**	**Area ('000 ha)**	**Percent (%) of total**
	1. Black	20.489	10.54
	2. Medium black	36.148	18.60
	3. Alluvial	19.335	9.95
	4.Sandy	2.292	1.18
	5. Saline	20.421	10.51
	6. Hilly/ Leterite	95.590	49.20
	Others (specify):	-	-

(Source :Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), District Irrigation Plan, VALSAD, GUJARAT (2016-2020) p-31.

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	165.3	120.0
	Area sown more than once	17.5	
	Gross cropped area	182.8	

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

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	58.8		
	Gross irrigated area	91.2		
	Rain fed area	104.588		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	361	15.4	25.0
	Tanks	363	1.4	2.2
	Open wells /Bore wells	6861	28.2	45.8
	River/ check dam	446	16.6	26.9
	Lift irrigation schemes	NA	NA	-
	Micro-irrigation Pump sets	18019	25	-
	Other sources (please specify)	NA	NA	-
	Total Irrigated Area	46768	61.6	100.0
	No. of Tractors	1842		
	Ground water 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	√		
	Wastewater availability and use			
	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) (Specify year – 2014-15)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	**Rain fed**	**Total**	**Irrigated**	**Rain fed**	**Total**	**Summer**	**Grand total**
	Paddy	18.66	51.54	70.20	-	-	-	1.000	71.20
	Ragi	-	5..60	5.60	-	-	-	-	5.60
	Sugarcane				12.445	-	12.445		12.445
	Indian bean	-	-	-		8.180	8.180		8.180
	Niger				5.87		5.87		5.87

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

	Horticulture crops – Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rain fed**
	Mango	29.40		29.40
	Sapota	3.1		3.1
	Banana	0.80	0.80	
	Cashew nut	5.84		5.84
	Coconut	0.180		0.180
	Horticulture crops – Vegetable	Total	Irrigated	Rain fed
	Okra	2.23	2.23	-
	Tomato	1.93	1.93	-

	Brinjal	2.56	2.56	-
	Cucurbits	4.06	2.0	2.06
	Medicinal and Aromatic crops	Total	Irrigated	Rain fed
	Plantation crops	Total	Irrigated	Rain fed
	NIL	NIL	NIL	NIL
	Eg., industrial pulp wood crops etc.	NIL	NIL	NIL
	Fodder crops	Total	Irrigated	Rain fed
	Grasses	0.098	NIL	0.098
	Total fodder crop area	0.098	NIL	0.098
	Grazing land	-	-	-
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

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

1.8	**Livestock (2012)**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	85.91	73.07	158.98
	Crossbred cattle	10.75	74.43	85.18
	Non descriptive Buffaloes (local low yielding)	27.2	49.1	76.3
	Graded Buffaloes	-	-	-
	Goat	85.4	37.06	122.4
	Sheep	1.2	2.2	3.4
	Others (Camel, Pig, Yak etc.)			
	Commercial dairy farms (Number)			

1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**
	Commercial		74.5
	Backyard		387.7

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			

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

1.11 Production and Productivity of major crops (Average of last 5 years: 2013-2015; 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)										
	Paddy (Irrigated)	74.674	4001	-	-	-	-	74.674	4001	-
	Paddy (Un-Irrigated)	163.404	3170	-	-	-	-	163.404	3170	-
	Ragi	10.376	1850	-	-	-	-	10.376	1850	-
	Sugarcane	-	-	821.37	66000	-	-	821.37	66000	--
	Indian bean	-	-	4.908	600	-	-	4.908	600	-
	Niger	-	-	3.659	750	-	-	3.659	750	-

Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	271.268	9226					271.268	9226	-
	Sapota	28.155	9058					28.155	9058	-
	Banana	45.167	56458					45.167	56458	-
	Cashew nut	18.716	3199					18.716	3199	-
	Coconut	0.130	10000 nuts					0.130	10000 nuts	-

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Paddy	Ragi	Sugarcane	Indian bean	Niger
	Kharif- Rain fed	2nd week of June to	2nd week of June to		-	2nd week of June to 2nd

		2nd week of July	2nd week of July			week of July
	Kharif-Irrigated	2nd week of June to 2nd week of July				
	Rabi- Rain fed				2nd week of October to 2nd week of November	
	Rabi-Irrigated			1st week of Oct to 4th week of Jan.		

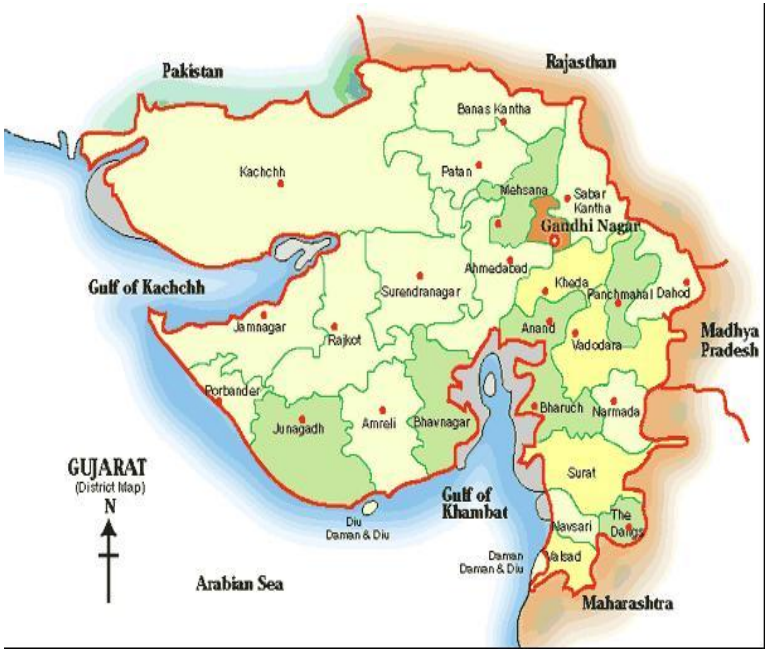
(Source :District Panchayat reports, reports of Agriculture department)

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought			√
	Flood			√
	Cyclone			√
	Hail storm			√
	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water intrusion			√
	Pests and disease outbreak (specify)		√	
	Others (specify)	Nil	Nil	Nil

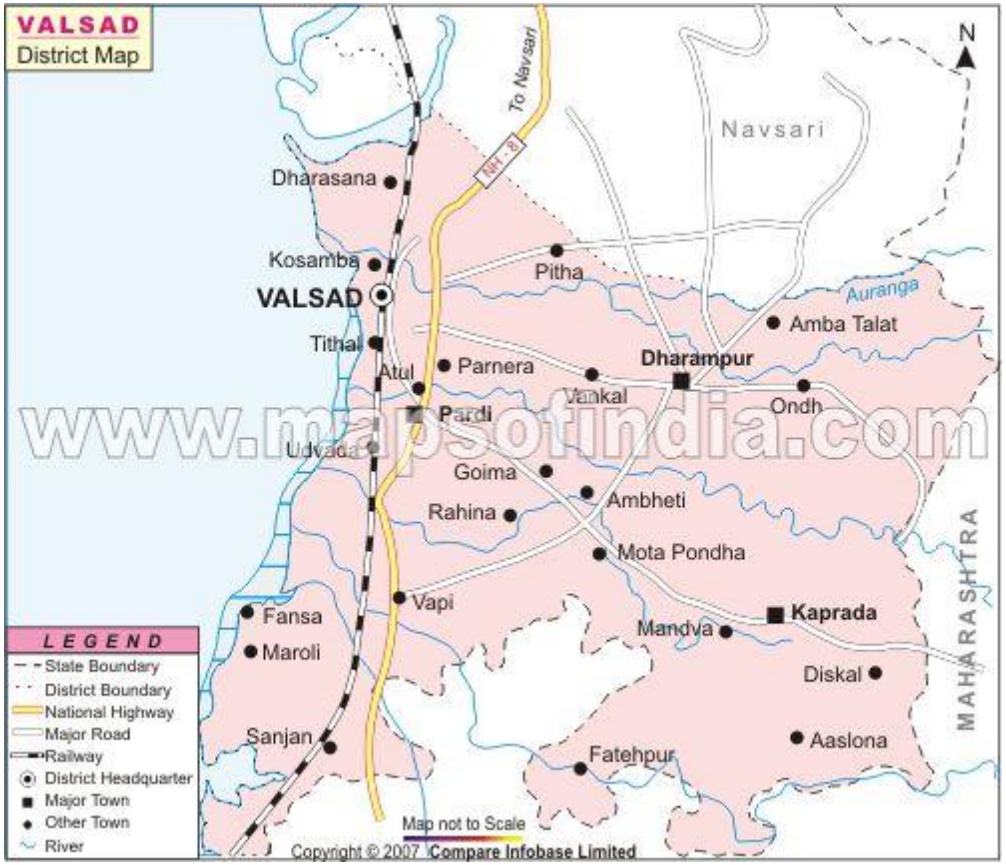
(Source :District Panchayat reports, reports of Agriculture department)

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: No

Location map of district within state



Map of Valsad district



Rainfall data of last 10 years for Valsad district

Sr.No.	Year	Rainfall(mm)
1	2007	2877
2	2008	1901
3	2009	2428
4	2010	2472
5	2011	2562
6	2012	1597
7	2013	2819
8	2014	2096
9	2015	1656
10	2016	2673

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 **July 2 nd week**	Heavy rainfall and medium black soil	Paddy	**No Change**	Wider spacing Conservation furrow Inter cultivation Thinning Changes in nutrient application Sprouted seed sowing, mulching, alternate furrow irrigation in sugarcane	Linkage with RKVY, GSSC and NFSM
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		
		Niger	**No Change**		
	Heavy rainfall and deep black soil	Paddy	**No Change**	Delay nursery preparation Give irrigation to nursery, Delay nursery preparation Give irrigation to nursery Delay to fertilizer application Delay to fertilizer application	
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		
		Niger	**No Change**		
	Heavy rainfall and rocky soil	Paddy	No Change	Delay to fertilizer application Delay to fertilizer application	
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		

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 4 weeks **July 4 th week**	Heavy rainfall and medium black soil	Paddy	**No Change**	• Sprouted seed sowing in paddy • SRI method • Aerobic rice • Wider spacing • Mulching Micro irrigation	Linkage with RKVY, GSSC and NFSM
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		
	Heavy rainfall and deep black soil	Paddy	No Change	Delay nursery preparation Gave irrigation to nursery,Delay nursery preparation Gave irrigation to nursery Delay to fertilizer application Delay to fertilizer application	
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		
	Heavy rainfall and rocky soil	Paddy	No Change	• Wider spacing • Mulching • Micro irrigation • Interculturing	
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		

Condition	This is not expected in this district				
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 **August 3 rd week**	Heavy rainfall and medium black soil				
	Heavy rainfall and deep black soil				
	Heavy rainfall and rocky soil				

Condition	**This is not expected in this district**				
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 September 1 st week	Heavy rainfall and medium black soil				
	Heavy rainfall and deep black soil				
	Heavy rainfall and rocky soil				

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Heavy rainfall and medium black soil	Paddy	**No Change**	Mulching Interculturing Moisture conservation practices	Linkage with RKVY, GSSC and NFSM
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		
	Heavy rainfall and deep black soil	Paddy	No Change	Intercultivation Weed control Moisture conservation Conservation Furrow thinning	
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		
	Heavy rainfall and rocky soil	Paddy	No Change	Provision of life saving irrigation Intercultivation	
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		

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[e]**
At vegetative stage	Heavy rainfall and medium black soil	Paddy	**No Change**	Interculturing and soil mulching Moisture conservation practices	Linkage with RKVY, GSSC and NFSM
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		
		Niger	**No Change**		
	Heavy rainfall and deep black soil	Paddy	**No Change**	Moisture conservation practices Interculturing and soil mulching	Linkage with RKVY, GSSC and NFSM
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		
		Niger	**No Change**		
	Heavy rainfall and rocky soil	Paddy	**No Change**	Soil mulching Interculturing Moisture conservation	Linkage with RKVY, GSSC and NFSM
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At flowering/ fruiting stage	Heavy rainfall and medium black soil	Paddy	**No Change**	___	Link up with I W SM
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		
		Niger	**No Change**		
	Heavy rainfall and deep black soil	Paddy	**No Change**	___	
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		
		Niger	**No Change**		
	Heavy rainfall and rocky soil	Paddy	**No Change**	___	
		Ragi	**No Change**		
		Sugarcane	**No Change**		
		Indian bean	**No Change**		
		Niger	**No Change**		

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Heavy rainfall and medium black soil	Normal Crop/cropping system	Life saving irrigation, Harvest at physiological maturity stage	Sugarcane, Gram and other Pulse crops. Nursery for summer rice	1 Link up with I W SM and RKVY
	Heavy rainfall and deep black soil	Normal Crop/cropping system	Life saving irrigation, Harvest at physiological maturity stage	Sugarcane, Wheat, Pulses and vegetables	
	Heavy rainfall and rocky soil	Normal Crop/cropping system	Life saving irrigation, Harvest at physiological maturity stage	Sugarcane, Nursery for summer rice vegetables	

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	Heavy rainfall and medium black soil	Normal Crop/cropping system	Aerobic Paddy and SRI method of paddy cultivation, Wider spacing	1.Mulching 2. Alternate Furrow irrigation 3. Drip irrigation	Link up with I W SM, GSSC and NFSM
	Heavy rainfall and deep black soil	Normal Crop/cropping system	Aerobic Paddy and SRI method of paddy cultivation, Wider spacing	1.Mulching 2. Alternate Furrow irrigation 3. Drip irrigation	
	Heavy rainfall and rocky soil	Normal Crop/cropping system	Aerobic Paddy and SRI method of paddy cultivation, Wider spacing	1.Mulching 2. Alternate Furrow irrigation 3. Drip irrigation	

Condition	Not applicable				
	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	Heavy rainfall and medium black soil	Normal Crop/cropping system			
	Heavy rainfall and deep black soil	Normal Crop/cropping system			
	Heavy rainfall and rocky soil	Normal Crop/cropping system			

Condition	Not applicable				
	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					

Condition	Not applicable				
	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					

Condition	Not applicable				
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall					

Condition	Not applicable				
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**

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	Provide drainage	Provide drainage	Removal excess water Harvesting at physiological maturity stage	Shift to safer place
Ragi	Provide drainage	Provide drainage	Removal excess water Harvesting at physiological maturity stage	Shift to safer place
Sugarcane	Provide drainage	Provide drainage -	Removal excess water Harvesting at physiological maturity stage	
Indian bean	Provide drainage	Provide drainage	-Removal excess water Harvesting at physiological maturity stage	Shift to safer place
Niger	Provide drainage	Provide drainage	Removal excess water Harvesting at physiological maturity stage	Shift to safer place
Horticulture				
Mango	Provide drainage	Provide drainage	Need base insect pest management	--
Sapota	Provide drainage	Provide drainage	Need base insect pest management	--

Banana	Provide drainage	Provide drainage	Need base insect pest management	--
Cashew nut	Provide drainage	Provide drainage	Need base insect pest management	--
Coconut	Provide drainage	Provide drainage	Need base insect pest management	--
Heavy rainfall with high speed winds in a short span				
Paddy	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in shade and turn frequently
Ragi	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in shade and turn frequently
Sugarcane	Provide drainage	Provide drainage	Wind break and shelter belt	----------
Indian bean	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in shade and turn frequently
Niger	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in shade and turn frequently
Horticulture				
Mango	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in shade and turn frequently
Sapota	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in shade and turn frequently
Banana	Provide drainage	Provide drainage	Wind break and shelter belt -	Shift to safe place dry in shade and turn frequently
Cashew nut	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in

				shade and turn frequently
Coconut	Provide drainage	Provide drainage	--	Shift to safe place
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Need based plant protection IPDM	Need based plant protection IPDM	Need based plant protection IPDM	Safe storage against storage pest and diseases
Ragi				
Sugarcane				
Indian bean				
Niger				
Horticulture				
Mango	Need based plant protection IPDM	Need based plant protection IPDM	Need based plant protection IPDM	Safe storage against storage pest and diseases
Sapota				
Banana				
Cashew nut				
Coconut				

2.3 Floods :- Not applicable

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:- Not applicable

Extreme event type	Suggested contingency measure			
	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: No contingency plan is required as this particular area do not experience any extreme weather situation in the past.