

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 (Newly formed district)			
	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 3 rd week	Sept 4 th 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)	264	163.4	57.6	17.5	2.3	9.5	7.5	4.5	-	1.7

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

1.4	Major Soils (common names like red sandy loam deep soils (etc.,)* (2006-07)	Area ('000 ha)	Percent (%) of total
	1. Black	37.22	14.1
	2. Medium black	137.01	51.9
	3. Loam	15.85	5.8
	4.Sandy	3.43	1.3
	5. Alkaline	0.79	0.3
	6. Rocky	69.7	26.4
	Others (specify):		

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	163.4	155.0
	Area sown more than once	89.8	
	Gross cropped area	253.3	

(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	10.9	23.5
	Tanks	363	1.2	2.6
	Open wells	6861	24.1	51.6
	Bore wells	446	10.3	22.1
	Lift irrigation schemes	NA	NA	-
	Micro-irrigation	NA	NA	-
	Other sources (please specify)	NA	NA	-
	Total Irrigated Area	46768	46.7	100.0
	Pump sets	18019	24.1	
	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 -- 2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total		
Paddy	16.8	55.5	72.4	-	-	-	1.0	73.4	
Ragi	-	5.1	5.1	-	-	-	-	5.1	
Sugarcane	12.4	-	12.4					12.4	
Indian bean	-	-	-		8.1	8.1		8.1	
Niger				5.8		5.8		5.8	

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

Horticulture crops – Fruits	Area ('000 ha)
	Total
Mango	2.0
Sapota	0.1
Banana	0.2
Cashew nut	0.2
Coconut	0.1
Horticulture crops – Vegetable	Total
Okra	1.4
Tomato	1.0

Brinjal	1.322
Bottle gourd	0.072
Medicinal and Aromatic crops	Total
Plantation crops	Total
NIL	NIL
Eg., industrial pulp wood crops etc.	NIL
Fodder crops	Total
Grasses	0.098
Total fodder crop area	0.098
Grazing land	-
Sericulture etc	-
Others (specify)	-

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

1.8	Livestock (2003-04)	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	122.8	96.4	219.2
	Crossbred cattle	21.7	67.1	88.8
	Non descriptive Buffaloes (local low yielding)			95.4
	Graded Buffaloes			
	Goat			146.6
	Sheep			2.9
	Others (Camel, Pig, Yak etc.)			
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds ('000)	

	Commercial						
	Backyard						
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: 2004, 05, 06, 07, 08; 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)	62.4	3700	-	-	-	-	62.4	3700	-
	Paddy (Un-Irrigated)	150.0	2700	-	-	-	-	150.0	2700	-
	Ragi	3.8	750	-	-	-	-	3.8	750	-
	Sugarcane	821.3	66000	-	-	-	-	821.3	66000	--
	Indian bean	-	-	4.9	600	-	-	4.9	600	-
	Niger	-	-	2.3	400	-	-	2.3	400	-

Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	18.5	9000					2065	9000	-
	Sapota	1.5	9000					1.5	9000	-
	Banana	9.5	45000					9.5	45000	-
	Cashew nut	0.1	600					0.1	600	-
	Coconut	130	10000 nuts					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	15 th June to 15 th July	15 th June to July		-	15 th June to 15th July
	Kharif-Irrigated	15 th June to 15 th Oct				
	Rabi- Rain fed				November-October	
	Rabi-Irrigated			1 st Oct to 31 st 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)			-

(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 Valsad district in Gujarat State



Rainfall data of last 10 years for Valsad district

S.No.	Year	Rainfall(mm)
1	2000	1824
2	2001	2124
3	2002	1817
4	2003	2354
5	2004	2589
6	2005	3131
7	2006	2455
8	2007	2877
9	2008	1901
10	2009	2428

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rain fed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks July 2 nd week	Heavy rainfall and medium black soils	Paddy	No Change	<ul style="list-style-type: none"> • 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 soils	Paddy	No Change	Delay nursery preparation Give irrigation to nursery,	
		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	
		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	<ul style="list-style-type: none"> • 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 to fertilizer application	
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		

	Heavy rainfall and rocky soil	Paddy	No Change	<ul style="list-style-type: none"> •Wider spacing •Mulching •Micro irrigation •Interculturing 	
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	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 August 3 rd week	Heavy rainfall and medium black soil	This is not expected in this district			
	Heavy rainfall and deep black soil				
	Heavy rainfall and rocky soil				

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

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset)					
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 Intercultivation 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	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Heavy rainfall and medium black soil	Paddy	No Change	Intercultivation and soil mulching Moisture conservation practices	As above
		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 Intercultivation and soil mulching	As above
		Ragi	No Change		
		Sugarcane	No Change		
		Indian bean	No Change		
		Niger	No Change		
	Heavy rainfall and rocky soil	Paddy	No Change	Soil mulching Intercultivation Moisture conservation	As above
		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 measures	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	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought	Heavy rainfall and medium black soil	As above	Life saving irrigation, Harvest at physiological maturity stage	Sugarcane, Gram and other Pulse crops. Nursery for summer rice	Link up with I W SM and RKVY
	Heavy rainfall and deep black soil	As above	Life saving irrigation, Harvest at physiological maturity stage	Sugarcane, Wheat, Pulses and vegetables	
	Heavy rainfall and rocky soil	As above	Life saving irrigation, Harvest at physiological maturity stage	Sugarcane, Nursery for summer rice vegetables	

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			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	As above	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	As above	Aerobic Paddy and SRI method of paddy cultivation, Wider spacing	1. Mulching 2. Alternate Furrow irrigation 3. Drip irrigation	
	Heavy rainfall and rocky soil	As above	Aerobic Paddy and SRI method of paddy cultivation, Wider spacing	1. Mulching 2. Alternate Furrow irrigation 3. Drip irrigation	

Condition					
	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	As above	Not applicable		
	Heavy rainfall and deep black soil	As above			
	Heavy rainfall and rocky soil	As above			

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			Not applicable		

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			Not applicable		

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

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Paddy	Provide drainage	Provide drainage	Removal excess water Harvesting at physiological maturity stage	Shift to safer place
Ragi	-Do-	-Do-	Drain out excess water Harvest for vegetable purpose	Safe storage against storage pest and disease
Sugarcane	-Do-	-Do-	-Do-	-----
Indian bean	-Do-	-Do-	-Do-	-Do-
Niger	-Do-	-Do-	-Do-	-Do-
Horticulture				
Mango	Provide drainage	Provide drainage	Need base insect pest management	Shift to safe place dry in shade and turn frequently
Sapota	-Do-	-Do-	-Do-	-Do-
Banana	-Do-	-Do-	-Do-	-Do-
Cashew nut	-Do-	-Do-	-Do-	-Do-
Coconut	-Do-	-Do-	-Do-	-Do-
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	DO-
Sugarcane	-Do-	-Do-	-Do-	-Do-
Indian bean	-Do-	-Do-	-Do-	-Do-
Niger	-Do-	-Do-	-Do-	-Do-
Horticulture				
Mango	Provide drainage	Provide drainage	Wind break and shelter belt	Shift to safe place dry in shade and turn frequently
Sapota	-Do-	-Do-	-Do-	-Do-
Banana	-Do-	-Do-	-Do-	-Do-
Cashew nut	-Do-	-Do-	-Do-	-Do-
Coconut	-Do-	-Do-	-Do-	-Do-
Outbreak of pests and diseases due to unseasonal rains				
Paddy	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
Sapota				

Banana				diseases
Cashew nut				
Coconut				

2.3 Floods: - Not applicable

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
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				
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2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	Insurance Encourage perennial fodder on bunds and waste land on community basis Establishing fodder banks, encouraging fodder crops in irrigated area Silage – using excess fodder for silage	Utilizing fodder from perennial trees and Fodder bank reserves Utilizing fodder stored in silos Transporting excess fodder from adjoining districts Use of feed mixtures	Availing Insurance Remove unproductive livestock
Drinking water	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 vaccines	Conducting mass animal Health Camps and treating the affected once in Campaign	Remove sick animals
Floods	Not observed		
Feed and fodder availability			
Drinking water			
Health and disease management			
Cyclone	Not observed		
Feed and fodder availability			
Drinking water			

Health and disease management			
Heat wave and cold wave	Not observed		
Shelter/environment management			
Health and disease management			

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drought				
Shortage of feed ingredients	Insurance & Integration Establishing geed serve Bank	Utilizing from feed serve banks	Availing insurance Strengthening feed Reserve Banks	Insurance & Integration Establishing geed serve Bank
Drinking water	Preparing of tank of water	Campaign and Mass Vaccination	Culling affected birds	Preparing of tank of water
Health and disease management	Emergency Veterinary preparedness with medicines vaccination to birds	Careful watch	Careful watch	----
Floods	Not observed			
Shortage of feed ingredients				
Drinking water				
Health and disease management				

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				

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture	Ponds are filled with breaks water Liming treatment is done	Live stock removed from the ponds	Ponds should be dried and refilled with fresh water and maintain breeding material/live stock.
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
B. Aquaculture	Mixing of creek water and fresh water Desilting is practiced	Live stock is removed/sold	Ponds should be drained and refilled with fresh water
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
2) Floods			

A. Capture	Out let of ponds are opened and livestock is shifted to another place	-	Out let are closed and live stock shifted and lime treatment is done
Marine			
Inland			
(i) Average compensation paid due to loss of human life			
(ii) No. of boats / nets/damaged			
(iii) No.of houses damaged			
(iv) Loss of stock			
(v) Changes in water quality			
(vi) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water			
(ii) Water contamination and changes in water quality			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
3. Cyclone / Tsunami	Not observed		
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	Not observed		
(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)			
4. Heat wave and cold wave	Not observed		
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			