

State: PUNJAB

Agriculture Contingency Plan: District- MANSA

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Western Plain, Kachchh And Part Of Kathiawar Peninsula, Hot Arid Eco-Region (2.3)		
	Agro-Climatic Region (Planning Commission)	Trans Gangetic Plain Region (VI)		
	Agro Climatic Zone (NARP)	Western Zone (PB-5)		
	List all the districts or part thereof falling	Ferozepur, Mansa, Musktsar		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		29°58'44.83" N	75°23'48.02" E	241 m
	Name & Address of concerned ZRS/ZARS/RARS/RRS/RRTTS	RS, Bathinda		
	Mention the KVK located in the district with address	KVK, Khokhar Khurd (Mansa), PIN-141 004		
Name & Address of the nearest Agromet. Field Unit (AMFU, IMD) for agroadvisories in the zone	AMFU, Bathinda			

1.2	Rainfall	Rainfall (mm)	Rainy days (Number)	Normal Onset (week and month)	Normal Cessation (week and month)
	SW monsoon (June-September):	116.3		End of June to 1 st week of July	Second week of September onwards
	NE Monsoon(October-December):	2.5	-	-	

	Winter (Jan-February)	22.2	-		
1.5	Agricultural land use	Area ('000 ha)		Cropping Intensity%	
	Net sown area	190		194	
	Area sown more than once	179			
	Gross sown area	369			
	Summer (March-May)	12.8	-		
	Annual:	153.8			

1.3	Land use pattern of the district	Total geographical area	Cultivable area	Forests	Land under non-agriculture use	Permanent pastures	Cultivable waste land	Land under misc. tree crops & grooves	Barren and unculturable land	Current fallows	Other fallows
	Area ('000 ha)	219	190	3	15	-	-	-	-	6	-

1.4	Major Soil types	Area ('000ha)	% Area of total geographical area
	Alluvial plains	184.2	84.0
	Sand dunes	17.6	8.0
	Basin	3.0	1.3
	Alluvial plains (Low lying)	14.3	6.5

1.6	Irrigation	Area ('000'ha)			
	Net irrigated area	190			
	Gross irrigated area	365.2			
	Rainfed area	-			
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area	
	Canals		96	51	
	Tanks	-	-	-	
	Open wells	-	-	-	
	Bore wells (Tubewells)	26123	94	49	
	Lift irrigation schemes				
	Micro-irrigation				
	Other sources (please specify)				
	Total Irrigated Area		190		
	Pump sets	30131			
	No. of Tractors	15800			
	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	5	100%		
	Critical	-	-		
	Semi- critical	-	-		
	Safe	-	-		
	Wastewater availability and use	-	-		
Ground water quality	Not suitable for irrigation		Salinity (EC > 3000 µS/cm at 25 ° C), Fluoride (>1.5 mg/l), Iron (>1.0 mg/l), Nitrate (>45 mg/l)		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%					
1.7	Area under major field crops ('000 ha)	<i>Kharif irrigated</i>	<i>Rabi irrigated</i>	Summer	Total
	Crop				
	Cotton	90	-	-	90

Rice	71	-	-	71
Moong	0.5		-	
Wheat	-	169	-	169
Rapeseed & Mustard	-	2.0	-	2.0
Barley	-	1.0	-	1.0
Horticulture crops	Area ('000 ha)			
Fruits	Total			
1 Citrus	0.5			
2 Grapes	0.5			
3 Guava	0.1			
4. Ber	0.1			
5 Peach	0.006			
Others (Amla, Pappaya, Karonda etc.)	0.002			

Vegetable crops	Area ('000 ha)			
	Total			
Potato	0.1			
Onion	0.04			
Winter vegetables	0.2			
Summer vegetables	0.2			
Root crops	0.2			
Sericulture	-			
Medicinal and Aromatic crops	-			
Plantation crops	-			
Grazing lands (ha)	-			

Fodder crops (2007-08)	Area ('000 ha)			
<i>Kharif</i>	<i>Rabi</i>	Total		
Maize	Barseem			

Jowar	Jawi	
Bajra	Rayi grass	
Cowpea	Lucerne	
Makkchari	Japense grass	
Total Fodder crops		9.5

1.8	Livestock (in number)	Male ('000)	Female ('000)	Total ('000)	
	Non descriptive Cattle (local low yielding)	19.3	17.6	37.2	
	Crossbred cattle	3.8	14.6	18.4	
	Non descriptive Buffaloes (local low yielding)	0.4	2.8	3.1	
	Graded Buffaloes	26.1	203.8	229.9	
	Goat	4.5	13.9	18.4	
	Sheep	4.1	14.4	18.6	
	Others Equine (Horse & Pony)	0.8	0.4	1.2	
Commercial dairy farms (Number)				-	
1.9	Poultry	No. of farms	Total No. of birds ('000)		
	Commercial	43	207.6		
	Backyard		9.4		
1.10	Fisheries (Data source: Chief Planning Officer of district)				
	A. Capture				
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs	No. of village tanks
45		-	468		

	B. Culture			
		Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)	639.7	6.4	4.1
	ii) Fresh water (Data Source: Fisheries Department)			

Production and Productivity of major crops (2008-2009)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (000 tons)
		Production ('000 Mt)	Productivity (kg/ha)	Production ('000 Mt)	Productivity (kg/ha)	Production ('000 Mt)	Productivity (kg/ha)	Production ('000 Mt)	Productivity (kg/ha)	
1.	Cotton	*366	571	-	-	-	-	-	-	-
2.	Rice	296	4168	-	-	-	-	-	-	-
3.	Wheat	-	-	791	4623	-	-	-	-	-
4.	Potato	-	-	4.1	20714	-	-	-	-	-
5.	Rapeseed & Mustard	-	-	3	1247	-	-	-	-	-

Major Horticultural crops (Crops to be identified on the basis of total acreage)

	Horticultural crops	Production ('000 t)	Productivity (kg/ ha)
1.	Citrus	9.8	

2.	Grapes	1.4	28874
3.	Guava	2.9	21714
4.	Ber	2.3	17194
5.	Peach	0.1	17820
6.	Others (Amla, Pappaya, Karonda etc.)	0.02	

refers to 000 bales

1.12	Sowing window (start and end of sowing period) (Specify week eg. 1st week of June to 1st week of July)	Cotton	Rice	Wheat	Rapeseed/Mustard
	Kharif- Rainfed	-	-	-	-
	Kharif-Irrigated	April/May to Oct./Nov.	June to Oct.	-	-
	Rabi- Rainfed	-	-	-	-
	Rabi-Irrigated	-	-	Oct./Nov. to April	Oct./Nov. to April

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 inundation			✓
	Pests and diseases	✓		
	Others (specify)			

1.14	Include Digital maps of the district for	Location map of district with in State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed : Yes
		Soil map as Annexure 3	Enclosed : Yes

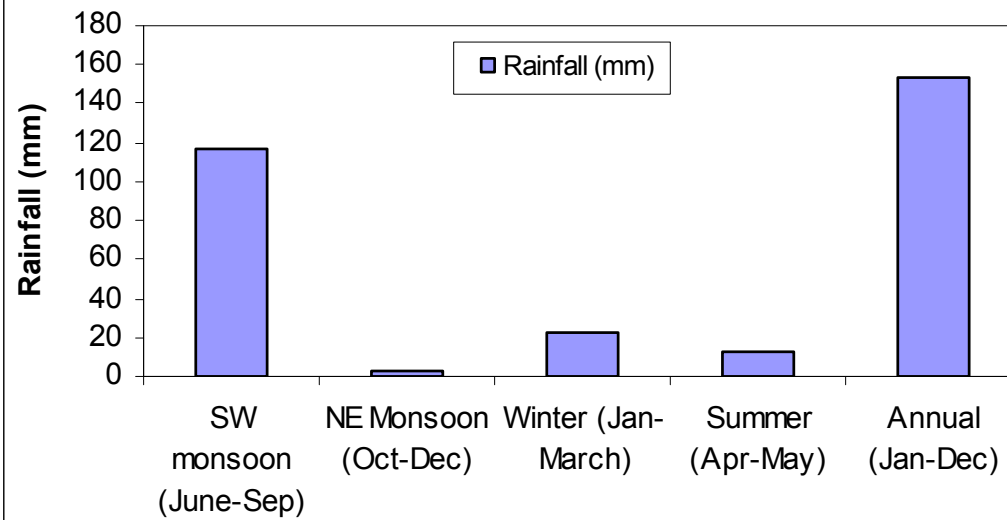
Annexure I

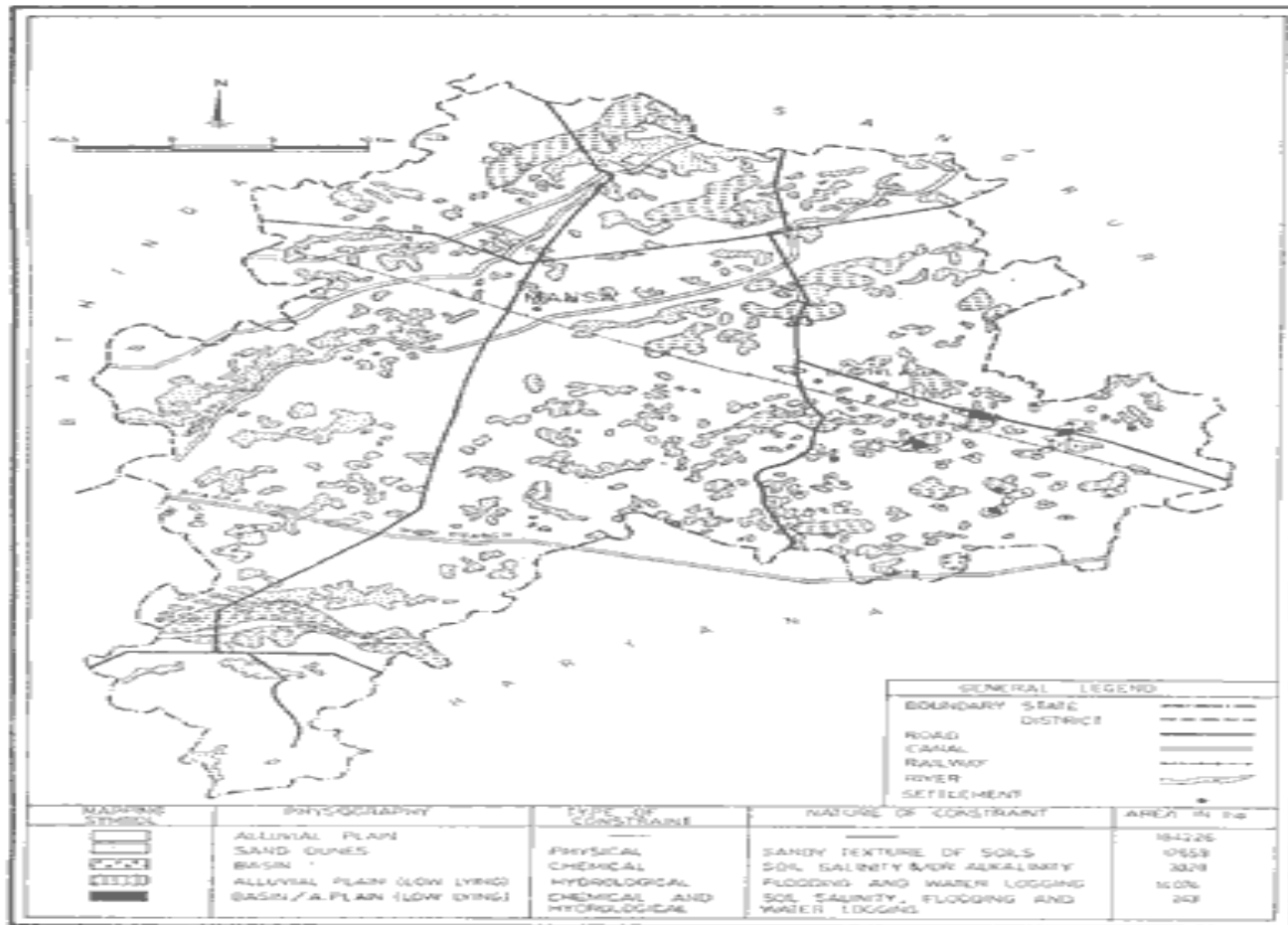
LOCATION OF MANSA



Annexure II

**Five year (2004-2008) Average rainfall (in mm) of Mansa district
in different seasons**





Annexure III - Soil types Map of Mansa District, Punjab

2.0 Strategies for weather related contingencies

2.1 Drought: N A

2.1.1 Rainfed situation: N A

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 (Specify month)	NA				

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 (Specify month)	NA				

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 6 weeks (Specify month)	NA				

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 8 weeks (Specify month)	NA				

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.	NA				

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 measures	Remarks on Implementation
At vegetative stage	NA				

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	NA				

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
	NA				

2.1.2 Irrigated situation

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed/ limited release of water in canals due to low rainfall	Canal irrigated Alluvial soils	Cotton - Wheat	Cotton (RCH -308 Bt)	Cotton: Ridge planting with each furrow irrigation Gap filling by transplanting 21 days old cotton seedlings. Alternate furrow irrigation with poor quality Tube well water after PSI with Canal water.	(Pun seed, NSC, PAU and progressive farmers)
		Rice - Wheat	Rice :Grow short duration varieties (P R 115)	Rice: Wheat: Bi-directional sowing / Bed planting closed spacing(7.5x22.5 cms) Seed priming	
			Wheat: Grow late sown varieties (PBW 509 and PBW 590)		
		Cotton- Rapeseed/Mustard Rice- Rapeseed/Mustard	Rapeseed/Mustard Torla (PBT 37) Raya (PBR 210 and PBR 97) Gobhi Sarson (PGSH 51 and GSL 2)	Rapeseed/Mustard: Bed planting Micro irrigation life saving irrigations, only in critical stages of crop (eg. flowering etc.	

Condition			Suggested Contingency measures		
	Major Farming situation	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			N A		

Condition			Suggested Contingency measures		
	Major Farming situation	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			N A		

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall					(Pun seed, NSC, PAU and progressive farmers)
Any other condition (specify)	-	-	-	-	-

2.2 Un-timely (unseasonal) rains

Condition	Suggested contingency measure			
Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Cotton	Ridge planting, pumping out excess rain water	Pumping out excess rain water, application of nitrogenous fertilizer, foliar spray of 2 % KNO ₃	Pumping out excess rain water and chemical control of pests/ diseases (1.Insect/Pests: Spray Imedachlopid 40 ml/ Pride20ml/acre for Jassid; Hostathion 600 ml/acre against white fly; Larwin@250gOr Ekalux 800ml/acre to check Mealy bug; synthetic pyrethroids/Carbamate insecticides against Pink/ spotted /American (small size) boll worm ; Organophosphate/Naturalite/ oxadiazine against American (big size) boll worm and Carbamate/ Organochlorinate/ Organophosphates against Tobacco boll worm. 2.Diseases: Grow LH 144/LH 2076 against Leaf curl; Cobalt chloride(COCl ₂) to check para wilt disease, Spray blitox+ streptocycline against Bacterial Blight and Blitox/Captan for control of Anthrenose, leaf blight and leaf spot .	Storage of produce at safer place
Rice	Pumping out excess rain water, Nitrogenous fertilizer application	Pumping out excess rain water.	Pumping out excess rain water	Shifting of produce to safer place for drying.

Wheat	Bed / bidirectional sowing, Pumping out excess rain water, apply Nitrogenous fertilizer and Gypsum(100 kg/acre) to check Nitrogen & Sulphur Deficiency respectively	Pumping out excess rain water, foliar spray of 3%urea solution	-do-	Shifting of produce at safer place for drying
Rapeseed/Mustard	Pumping out excess rain water, Apply Nitrogenous fertilizer and Gypsum(100 kg/acre) to check nitrogen & sulphur Deficiency respectively	Pumping out excess rain water Pest Aphid : Spray 40 gm of Actara 25WG or 400 ml Endosulfan 35 EC in 80-100 litre of water and disease management	-do-	-do-
Horticulture				
Citrus	Cultivation on well drained soils, drainage of excess water, raising of soil surface around the tree trunks, chemical control of foot rot/ Phytophthora, remove broken branches	Drain out excess rain water and prune out broken branches	Drain out excess water, Application of growth regulators to check fruit drop due to water-imbalance	Drain out excess water,
Guava	Drainage of excess water, raising of soil surface around the tree trunks	Drain out excess rain water	Shiftng and storage of harvested fruits at proper place	

Ber	-	Control of powdery mildew (spray karathene /Bayleton@0.5g/ltr or sulfur @ 2.5 g/ltr	Control of powdery mildew (spray karathene /Bayleton@0.5g/ltr or sulfur @ 2.5 g/ltr	Shifting and storage of rainy season harvested fruits at proper place
Grapes	Drainage of excess water, chemical control of anthracnose	Drain out excess rain water	Cultivation of early ripening cultivars(Perlette and BeautySeedless)and application of Israeli technique(?) f or quality improvement	-do-
Chilli	Re sowing	Wilting and lodging. Pumping of excess rain water and spray the crop with M -45 or Blitox @ 3 gm per litre water		-
Cucurbits	-	Rotting of flowers and fruit, Spray M-45 @ 3gm per litre of water		-
Outbreak of pests and diseases due to unseasonal rains				
Cotton	Spray Larwin@250g Or Ekalux 800ml/acre to check Mealy bug	<p>1.Insect/Pests: Spray Imidachloprid 40 ml/ Pride20ml/acre for Jassid; Hostathion 600 ml/acre against white fly; Larwin@250gOr Ekalux 800ml/acre to check Mealy bug; synthetic pyrethroids/Carbamate insecticides against Pink/ spotted /American(small size) boll worm ; Organophosphate/Naturalite/oxadiazine against American(big size) boll worm and Carbamate/ Organochlorinate/ Organophosphates against Tobacco boll worm.</p> <p>2.Diseases: Grow LH 144/LH 2076 against Leaf curl; Cobalt chloride(COCl₂) to check para wilt disease, Spray Blitox+streptocycline against Bacterial Blight and Blitox/Captan for control of Anthracnose,leaf blight and leaf spot .</p>		Storage of produce in dry place
Rice	Spray Nuvacron/Monocil@ 560 ml/acre against leaf folder	<p>1. Insect/Pests: Spray Nuvacron /Monocil@ 560 ml/acre against leaf folder and stem borer; Confidor @40 ml/acre/ Ekalux @ 800 ml/acre against Plant</p>		-do-

	and stem borer.	hoppers/ Rice ear cutting caterpillar. 2. Diseases: Grow PR 120, PAU 201, PR 111 against Bacterial leaf blight (BLB); spray Blitox(500ml)/Tilt (200ml) per acre to control False smut; Spray Tilt @ 200m l/acre against sheath blight ,Sheath rot and Bunt diseases.		
Wheat	Spray pesticide to control Pink boll worm especially in rice fields.	Spray Nuvacron @150ml/acre to control sucking pest (Aphid), Ekalux for Army worm (@400 ml); Boll worm(800 ml) per acre and Tilt @200ml/acre to check Kernel bunt & rusts.		Treat the produce meant for seed with 250gm Malathion dust(5%)and disinfect 10 gunny bags with 5 ml cymbush/10 litres water ,Godowns with 100 ml Malathion/10 litres water.
Rapeseed/Mustard	Spray the pesticides when the insects (Aphids,jassids) have completely covered the flowers and pods	Aphids : Spray Actara 25 WG@ 40 g or Rogar 30 EC in 80-125 litres of water. Diseases: Two sprays of Blitox or Indofil M-45 in 100 litres of water at interval of 15 days to check white rust and Alternaria blight		Storage of produce in dry place
Horticulture				
Citrus	Chemical control of Phytophthora / foot rot with Ridomil-MZ/ Alliette as per recommendation (Decorticate and disinfect the wound on trunk either with disinfect solution and cover the wounds with Bordeaux paste folled by Bordeaux mixtureand Ridomil MZ as paint(2g/100ml of linseed oil) to the infected tree Control of sucking pests with systemic pesticides (1250 ml Roger (dimethoate)30 EC)	Chemical control of Phytophthora / Foot rot with Ridomil-MZ/ Alliette as per recommendation(Decorticate and disinfect the wound on trunk either with disinfect solution and cover the wounds with Bordeaux paste folled by Bordeaux mixtureand Ridomil MZ as paint(2g/100ml of	Chemical control of Phytophthora / Foot rot with Ridomil-MZ/ Alliette as per recommendation (Decorticate and disinfect the wound on trunk either with disinfect solution and cover the wounds with Bordeaux paste folled by Bordeaux mixture and Ridomil MZ as paint(2g/100ml of linseed oil) to the infected tree), Control of sucking pests with systemic pesticides	Application of fungicides/ nutrients (GA 3 @ 30 ppm and wrapping in polythene of 100 gauze) to check post harvest losses

		linseed oil) to the infected tree) Control of sucking pests with systemic pesticides		
Grapes	Chemical control (Prune the shoots in in Jan and Feb, Spray Bordeaux mixture in last week of March, Spray Bavistan 50 WP @ 500g in last week of May in 500 L of water , Spray Bavistan 50 WP @ 500g in mid July in 500 L of water)of sucking pests and diseases like Powdery mildew/ Anthracnose	Chemical control of sucking pests and diseases like powdery mildew/ Anthracnose	Chemical control of sucking pests and diseases like powdery mildew/ anthracnose/ hen and chicken disease/shot berry etc.	Timely harvesting of grapes, storage in proper CFB boxes.
Guava	Chemical control(Anthracnose/wilt with @300g and insects like fruit fly with Fenvelrate @1250 mi) of sucking pests	Chemical control (Anthracnose/wilt with @300g and insects like fruit fly with Fenvelrate @1250 mi) of sucking pests and diseases like anthracnose.	Chemical control (Anthracnose/wilt with @300g and insects like fruit fly with Fenvelrate @1250 mi) of fruit fly and anthracnose of guava. Harvesting at proper maturity level.	
Ber	Chemical Control of powdery mildew (spray karathene /Bayleton@0.5g/liter or sulfur @ 2.5 g/liter) of Leaf eating caterpillar and diseases like powdery mildew.) of fruit fly Control of leaf eating catterpillar	Spray sevin (Hexavin)@3g/liter Pumping out of excess rain water to check wilt	Sray Endosulfan@ 2.5g/liter (fruit fly) Spray sevin (Hexavin)@3g/liter (leaf eating caterpillar) Spray Blitox @ 5 g/ l water to check rotting of fruit	- Keep in dry place
Chilli	--			
Cucurbits	-	Spray Indofil M 45 @ 3 g/l water against downy mildew	Spray Blitox @ 5 g/ l water to check rotting of fruit. Also destroy the infested fruits and spray the crop with Endosulfan @ 8 ml/l or Sevin @ 5 g/l water to control fruit fly	-

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Cotton	Heavy irrigation (psi) with canal water, planting of crop on eastern side Of N-S ridge, gap filling and light irrigation	Apply light irrigation	NA	
Rice	Correct Iron deficiency with 0.5 % iron sulphate spray, light and frequent irrigation	Pounding of water for fifteen days after transplanting to check iron deficiency and for crop establishment	NA	
Wheat	NA	NA	Apply light irrigation	NA
Rapeseed/mustard	-do-	-do-	-do-	-do-
Horticulture				
Citrus	Light and frequent irrigation and shelter from western side to check sun scald and burning injury, application of white wash paint on main stems	Apply light and frequent irrigation to check Dropping of flowers and fruit with growth regulator like 2-4-D/GA (20 ppm)	NA	NA
Cucurbit	Frequent irrigation and shelter from western side to check burning of crops	Apply frequent irrigation to check drooping of flowers and drawing of pollens.	NA	NA
Ber	light and frequent irrigation and shelter from western side	light and frequent irrigation, application of white wash paint on main stem		

Chilli	Mulching and frequent irrigation	Mulching and frequent irrigation	Mulching and frequent irrigation	NA
Cold wave				
Field crops	NA	NA	NA	NA
Horticulture				
Citrus	Apply light and frequent irrigation , protect the plants by providing shelter from North-West direction, smoking	Apply light and frequent irrigation , protect the plants by providing shelter from North-West direction, smoking		NA
Ber	-do-	-		-
Guava	-do-	-		-
Frost				
Horticulture				
Citrus	New plantation, and cover the plants with grass or sarkanda etc	Installation of wind breaks, smoking etc.		NA
Ber	Protection of nursery with sarkanda etc/ growing of nursery under protected structures.	Apply light irrigation, smoking		-
Guava	-do-	Installation of wind breaks, smoking, light irrigation etc.		-
Hailstorm				
Field crops	Resowing or re-transplanting			
Horticulture				
Citrus	Protection of nursery with sarkanda etc/ growing of nursery under protected structures.	Removal of broken limbs Apply light irrigation and spary blitox to check fungal infection with, Bordeaux mixture etc.		NA
Ber	-do-	Apply light irrigation and sprays fungicide		
Tomato	Re sowing or retransplanting	Apply light irrigation and sprays fungicide		Apply light irrigation and sprays fungicide -

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
<i>Drought</i>	Not Applicable		
Floods			
Feed and fodder availability	<p>In case of early forewarning (EFW), harvest all the crops (paddy/wheat/barley/maize/mungbean etc.) that can be useful as feed/fodder in future (store properly)</p> <p>Keeping sufficient of dry fodder to transport to the flood affected villages</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>Keep stock of bleaching powder and lime</p> <p>Carry out Butax spray for control of external parasites</p> <p>Identify the Clinical staff and trained paravets and indent for their services as per schedules</p> <p>Identify the volunteers who can serve in need of emergency</p> <p>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations</p>	<p>Transportation of animals to elevated areas</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe storms, un-tether or let loose the animals</p> <p>Use of unconventional and locally available cheap feed ingredients for feeding of livestock.</p> <p>Avoid soaked and mould infected feeds / foddors to livestock</p> <p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Encouraging farmers to cultivate short-term fodder crops like sunhemp, Lucerne, berseem, maize etc.,.</p> <p>Deworming with broad spectrum dewormers</p> <p>Proper disposable of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p>

			Drying the harvested crop material and proper storage for use as fodder.
Cyclone	Not applicable		
Cold wave	Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	<p>Allow for late grazing between 10AM to 3PM during cold waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves</p> <p>In severe cases, put on the heaters at night times</p> <p>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Heat wave	<p>Arrangement for protection from heat wave</p> <p>i) Plantation around the shed</p> <p>ii) H₂O sprinklers / foggers in the shed</p> <p>iii) Application of white reflector paint on the roof</p> <p>iv) Thatched sheds should be provided as a shelter to animal to minimize heat stress</p>	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers/fans during heat waves in case of high yielders (Jersey/HF crosses)</p> <p>In severe cases, vitamin 'C' and electrolytes should be added in H₂O during heat waves.</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>

2.5.2 Poultry

	Suggested contingency measures			Convergence/ linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drought	<i>Not applicable</i>			
Floods				
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging	Routine practices are followed	
Drinking water	Provide clean drinking water	Sanitation of drinking water	Sanitation of drinking water	
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder to prevent ammonia accumulation due to dampness	Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD	
Cyclone	Not applicable			
Heat wave and cold wave				
Shelter/environment management	Heat wave: Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed	
	Cold wave: Provision of proper shelter	Close all openings with polythene sheets	Routine practices are followed	

	Arrangement for brooding Assure supply of continuous electricity	In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening		
Health and disease management	Deworming and vaccination against RD and fowl pox	Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C In hot summer, add anti-stress probiotics in drinking water or feed	Routine practices are followed	

2.5.3. Fisheries/ Aquaculture

	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	<ul style="list-style-type: none"> i) Critical analysis of long range forecast data. ii) Storage of water. iii) Afforestation program iv) Conservation of rivers, wetlands/village ponds. v) Re-excavation of local canals/ponds. 	<ul style="list-style-type: none"> i) Use stored water. ii) Make judicious use of available water sources. iii) Divert water from unutilized areas. iv) Utilize canal water. v) Aeration of fish ponds. 	<ul style="list-style-type: none"> i) Need based monitoring through research plan. ii) Intensive afforestation program. iii) Augmentation of surface water flow. iv) Construction of water reservoir. v) Adoption of rain harvesting methods. vii) Prepare vulnerability map.
(ii) Changes in water quality	<ul style="list-style-type: none"> i) Dumping of solid, liquid and 	<ul style="list-style-type: none"> i) Use disinfectants and 	<ul style="list-style-type: none"> i) To maintain water quality, need based research

	waste should be stopped. ii) Store chemicals, disinfectants and therapeutic drugs.	therapeutic drugs. ii) Adoption of bio remedial measures	data should be generated. ii) Dumping of solid, liquid and waste should be stopped through enactment of legislation.
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	i) Critical evaluation of long range forecast data. ii) Storage of water. iii) Afforestation program. iv) Installation of tube wells. v) Conservation of rivers/wetlands/dams. vi) Re-excavation of local canals and ponds	i) Use stored water. ii) Make judicious use of available water sources. iii) Divert water from unutilized areas. iv) Utilize canal water. v) Aeration of fish ponds.	i) Need based monitoring through research plan. ii) Intensive afforestation program. iii) Augmentation of surface water flow. iv) Construction of water reservoir. v) Adoption of rain harvesting methods. vii) Prepare vulnerability map.
(ii) Impact of salt load build up in ponds/Changes in water quality	i) Store chemicals, disinfectants and therapeutic drugs.	i) Immediate examination of water samples. ii) Use appropriate disinfectants and therapeutic drugs. iii) Adoption of bio-remedial measures. iv) Reduce salinity to moderate levels for increasing survival rate of fish/prawn/other organisms with the application of scientific techniques.	i) Need based research data should be generated. ii) Cleaning of water bodies. iii) Regular water monitoring and bio-monitoring of water bodies.

(iii) Any other	-	-	-
2. Flood			
A. Capture			
Marine	-	-	-
Inland			
(i) Average compensation paid due to loss of human life	<ul style="list-style-type: none"> i) Be prepared to evacuate at a short notice. ii) Preparation of flood control action plan. iii) Warning dissemination and precautionary response. iv) Formation of flood management committee. v) Mobilize local committees for protection. vi) Enhancement in coping capabilities of common people. vii) Insurance for the life of people/fishermen. 	<ul style="list-style-type: none"> i) Human evacuation from the area. ii) Coordination of assistance. iii) Damage and need assessment. iv) Immediate management of relief supplies. v) Immediate help and compensation delivery during emergency. 	<ul style="list-style-type: none"> i) Arrangement for rescue and casualty care. ii) Arrangement for burial control room. iii) Restoration of essential services, security and protection of property iv) Support to rehabilitation, logistics, training and awareness build up & testing and updating the plan v) Insurance claim.
(ii) No. of boats/nets damaged	<ul style="list-style-type: none"> i) Annual repair of boats/nets and gears. ii) Insurance of boats/nets/gears. 	<ul style="list-style-type: none"> i) Coordination of assistance. iii) Immediate management of relief supplies. iv) Govt. support and compensation. 	<ul style="list-style-type: none"> i) Education/ training for technical knowledge for the repair of boats/nets and gears. ii) Provision for evacuation. iii) Loss assessment & insurance claim.
(iii) No. of houses damaged	<ul style="list-style-type: none"> i) Educate and provide training for 	<ul style="list-style-type: none"> i) Damaged house enumeration 	<ul style="list-style-type: none"> i) Repair of damaged houses.

	<p>the repair of houses.</p> <p>ii) Store raw materials for repairing of houses.</p> <p>iii) House insurance.</p>	<p>and loss assessment.</p> <p>ii) Coordination of assistance.</p> <p>iii) Immediate management of relief supplies.</p> <p>iv) Immediate support and compensation.</p>	<p>ii) Loss assessment & insurance claim.</p>
(iv) Loss of stock	<p>i) Keep boats, nets/gears ready for emergency use.</p> <p>ii) Store fuels, food/other item.</p> <p>iii) Develop flood control management plans.</p> <p>iv) Stock material insurance.</p>	<p>i) Mobilize local people for protection</p> <p>ii) Hire stock/inputs from areas/company/ farmers who are not affected by flood.</p>	<p>i) Locate backup stocks and verify its usability.</p> <p>ii) Follow flood control management plan.</p> <p>iii) Notify utilities of the critical demand about loss of stock and inputs.</p> <p>iv) Loss assessment & insurance claim.</p>
(v) Changes in water quality	<p>i) Provision to stop/close the effluent/sewage discharge point in to water bodies.</p> <p>ii) Store chemicals, disinfectants and therapeutic drugs.</p> <p>iii) Develop flood control management plan.</p>	<p>i) Do not use contaminated water.</p> <p>ii) Proper preparation and management through emergency aeration.</p> <p>iii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs.</p> <p>iv) Immediate support of govt./industrial organization for maintaining the purity and quality of water bodies.</p> <p>v) Need based bioremediation.</p>	<p>i) Need based research data should be generated to maintain water quality,</p> <p>ii) Dumping of solid, liquid and waste should be stopped through enactment of legislation.</p> <p>iii) Contact govt. and industrial organization for immediate remedy and cleaning of the water bodies.</p> <p>iv) Regular water monitoring and bio-monitoring of water bodies for formulation of management plan.</p>
(vi) Health and disease	<p>i) Advance planning and preparedness.</p>	<p>i) Prompt action or immediate removal of disease causing</p>	<p>i) Laboratory diagnosis of disease fish, generation of data about type or kind of disease spread.</p>

	<ul style="list-style-type: none"> ii) Store chemicals, disinfectants and therapeutic drugs. iii) Stock sufficient stock of medicines. 	<ul style="list-style-type: none"> agents/ dead fish. ii) Proper disposal of dead fish. iii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs. iv) Emergency aeration or splashing in water bodies. 	<ul style="list-style-type: none"> ii) Eradicating the disease where possible. iii) Follow up surveillance and monitoring after disease outbreak. iv) Bio-monitoring and maintaining water quality. v) Need based research data should be generated. vi) Loss assessment & insurance claim.
B. Aquaculture			
(i) Inundation with flood water	<ul style="list-style-type: none"> i) Proper facility construction /strengthening for ponds and its stock safety. ii) Development of flood control management plan. iii) Arrangement of emergency backup equipment on site. iv) Insurance of stocks. v) Prevention from entry of alien/wild organisms through flood water. 	<ul style="list-style-type: none"> i) Arrangement for evacuation ii) Arrangement for rescue and casualty care iii) Arrangement for burial control room. iv) Restoration of essential services, security and protection of property. v) Coordination of assistance. vi) Damage and need assessment. vii) Immediate management of relief supplies. viii) Release excess water from height of T. ix) Lower the water level in culture facilities. 	<ul style="list-style-type: none"> i) Support to rehabilitation, logistics, training and awareness build up & testing and updating the plan. ii) Reallocate fish to maintain appropriate biomass so that waste assimilation capacity of pond is not exceeded. iii) Reduce or cease feeding because uneaten food and fish wastes causes decrease in dissolved oxygen level. iv) Strengthening of water bodies/ponds. v) Loss assessment & insurance claim.

<p>(ii) Water contamination and changes in water quality</p>	<p>i) Provision to stop/close the effluent/sewage discharge into water bodies. ii) Store chemicals, disinfectants and therapeutic drugs. iii) Develop flood control management plan.</p>	<p>i) Do not use contaminated water. ii) Proper preparation and management through emergency aeration. iii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs. iv) Immediate support of govt./industrial organization for maintaining the purity and quality of water bodies. iv) Need based bioremediation.</p>	<p>i) Need based research data should be generated to maintain water quality, ii) Dumping of solid, liquid and waste should be stopped through enactment of legislation. iii) Contact govt. and industrial organization for immediate remedy and cleaning of water bodies. iv) Regular water monitoring and bio-monitoring of water bodies for formulation of management plan.</p>
<p>(iii) Health and diseases</p>	<p>i) Advance planning and preparedness. ii) Store chemicals, disinfectants and therapeutic drugs. iii) Stock sufficient emergency medicines.</p>	<p>i) Identification of type of disease outbreak, prompt action or immediate removal of disease causing agents/ dead fish. ii) Proper disposal of dead fish. iii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs. iv) Determination of nature and speed of transmission of diseases. v) Proper preparation and management through emergency aeration.</p>	<p>i) laboratory diagnosis of disease fish, generation of data about type or kind of disease occurrence. ii) Eradicating the disease. iii) Follow up surveillance and monitoring after disease outbreak. iv) Proper disposal of dead fish. vii) Loss assessment & insurance claim.</p>

(iv) Loss of stock and input (feed, chemicals)	<ul style="list-style-type: none"> i) Keep the stock/input in safer place for emergency purpose. ii) Store fuels, food/other items. iii) Develop flood control management plan. iv) Stock material insurance. 	<ul style="list-style-type: none"> i) Search/locate the stock/input, if the condition is good can be used for the purpose otherwise discard it. ii) Mobilize local people for protection. iii) Purchase/hire valuable stock/inputs from areas/company/farmers who are not affected by flood 	<ul style="list-style-type: none"> i) Strengthening of stock. ii) Assessment of total loss. iii) Insurance claims.
(v) Infrastructure damage (pumps, aerators, huts etc)	<ul style="list-style-type: none"> i) Training for emergency the repair of infrastructure. ii) Store raw materials for repairing of pumps aerators, huts etc. iii) Infrastructure insurance. 	<ul style="list-style-type: none"> i) Damaged infrastructure enumeration and need assessment. ii) Locate backup equipment and verify its operation. iii) Coordination of assistance. iv) Immediate management of relief supplies. 	<ul style="list-style-type: none"> i) Locate backup equipment and verify its operation. ii) Notify utilities of the critical demand. iii) Repair of damaged infrastructure. iv) Loss assessment & insurance claim.
(vi) Any other			
3. Cyclone / Tsunami	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 (freshwater/brackish water ratio)	-	-	-
(iii) Health and disease	-	-	-
(iv) Loss of stock and input (feed, chemicals etc.)	-	-	-
(v) Infrastructure damage (pumps, aerators, shelters/huts etc.)	-	-	-
(vi) Any other	-	-	-
4. Heat wave and cold wave			
A. Capture			
Marine	-	-	-
Inland	<ul style="list-style-type: none"> i) Listen to local weather forecasts and stay aware of upcoming temperature changes. ii) Arrange the aerators. iii) Ensure sufficient water quantity in water bodies. iv) Formulate strategic fishing management during the heat waves or cold waves. v) Tree plantation around fish ponds 	<ul style="list-style-type: none"> i) Monitor fishing sites frequently to ensure that they are not affected by heat or cold waves. ii) Use dark materials to cover the water bodies during excessive heat waves. iii) Adopt proper care and management during the fishing period of cold/ heat waves like keeping stock of drinking water and extra cloths. iv) Educating the farmers through electronic / print media 	<ul style="list-style-type: none"> i) Intensive afforestation program. ii) Collect basic weather data on incidence of extreme as well as physical data of water bodies, water chemistry and seasonal changes, plankton profile and seasonal blooms, topography and soil composition. iii) Gather information about history of catch per unit effort as well as fish yield rate during heat wave and cold wave and accordingly simulate future plan for sustainable fishing. iv) Loss assessment & insurance claim.

B. Aquaculture			
(i) Changes in pond environment (water quality)	<ul style="list-style-type: none"> i) Listen to local weather forecasts and stay aware of upcoming temperature changes. ii) Arrange the aerators. iii) Ensure sufficient water quantity in water bodies. iv) Formulate strategic fishing management during heat/cold waves. v) Tree plantation around fish ponds. 	<ul style="list-style-type: none"> i) Avoid extreme temperature changes as well as low temperature changes for the safety of fishermen life. ii) Monitor fishing sites frequently to ensure that they are not affected by heat or cold waves. iii) Use dark materials to cover the water bodies during excessive heat waves. iv) Adopt proper care and management during the fishing period of cold/ heat waves like keeping stock of drinking water and extra cloths. v) Educating the farmers through electronic/ print media 	<ul style="list-style-type: none"> i) Intensive afforestation program for reducing heat waves. ii) Collect basic weather data on incidence of extremes as well as physical data of water bodies, water chemistry and seasonal changes, plankton profile and seasonal blooms, topography and soil composition. iii) Gather information about history of catch per unit effort as well as fish yield rate during heat wave and cold wave and accordingly simulate future plan for sustainable fishing. v) Loss assessment & insurance claim.
(ii) Health and disease management	<ul style="list-style-type: none"> i) Advance planning and preparedness. ii) Store chemicals, disinfectants and therapeutic drugs. iii) Develop heat/cold wave control 	<ul style="list-style-type: none"> i) Identification of type of disease outbreak, prompt action or immediate removal of disease causing agents/ dead fish. ii) Proper disposal of dead fish. 	<ul style="list-style-type: none"> i) laboratory diagnosis of disease agents, generation of data about type or kind of disease spread. ii) Eradicating the disease where possible. iii) Follow up surveillance and monitoring after

	<p>management plan.</p> <p>iv) Stock sufficient quantities of emergency medicines.</p>	<p>iii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs.</p> <p>iv) Determination of nature and speed of disease transmission.</p> <p>v) Proper preparation and management through emergency aeration or splashing in water bodies.</p>	<p>disease outbreak.</p> <p>iv) Loss assessment and insurance claim.</p>
(iii) Any other	-	-	-