

State: **PUNJAB**

Agriculture Contingency Plan for District: **FAZILKA**

1.0 District Agriculture profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Northern Plain (And Central Highlands) In (4.1)	
	Agro-Climatic Zone (Planning Commission)	Trans Gangetic plain region (VI)	
	Agro Climatic Zone (NARP)	Western zone (PB-5)	
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Ferozpur, Bathinda, Muktsar and Mansa	
	Geographic co-ordinates of district headquarters	Latitude	Longitude
		30°55'06'' N	74°36'55'' E
		Altitude	
		196 MSL	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Station, Abohar, Ferozpur-152116	
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Malwal Road, Ferozpur- PIN 152116	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Regional Station, Faridkot	

1.2	Rainfall	Normal RF(mm)	Normal Rainy days	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	278	-	July 1 st week	September 2 nd week
	NE Monsoon (Oct-Dec):	14.8	-		
	Winter (Jan- Feb)	42	-	-	-
	Summer (Mar-May)	21.6	-	-	-
	Annual	356.4	-	-	-

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)	585	475	12	39	-	-	-	-	-	-

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Coarse loamy	-	45
	Coarse loamy and fine loamy associations	-	40
	Fine loamy associations	-	15

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	475	184

Area sown more than once	401	
Gross cropped area	876	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	474.0		
	Gross irrigated area	874.6		
	Rained area	400.6		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals (40 % area is canal irrigated)	-	161	-
	Tanks	-	-	-
	Open wells	-	-	-
	Bore wells	92620	313	-
	Lift irrigation schemes	-	-	-
	Micro-irrigation	-	-	-
	Other sources (please specify)	-	-	-
	Total Irrigated Area	-	474	-
	Pump sets	-	-	-
	No. of Tractors	-	-	-
	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	-	-	-
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	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	260.0	-	260.0	-	-	-	-	260.0	
Cotton	117.0	-	117.0	-	-	-	-	117.0	
Moong	1.8	-	1.8	-	-	-	-	1.8	
Wheat	-	-	-	395.0	-	395.0	-	395.0	
Barley	-	-	-	5.0	-	5.0	-	5.0	
Rapeseed & Mustard	-	-	-	4.0	-	4.0	-	4.0	
Gram	-	-	-	1.3	-	1.3	-	1.3	

	Horticulture crops - Fruits	Area ('000 ha)
		Total
	Kinnow	17.5
	Orange & Malta	1.7
	Guava	0.6
	Ber	0.2
	Horticulture crops - Vegetables	Total
	Potato	1.0
	Other winter vegetable	2.4
	Other summer vegetable	1.9
	Medicinal and Aromatic crops	Total
		-
	Plantation crops	Total
	Sugarcane	1.0
	Eg., industrial pulpwood crops etc.	-
	Fodder crops	Total
	Total fodder crop area	-
	Grazing land	-
	Sericulture etc	-

1.8	Livestock (in number)	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	16.2	47.6	63.8
	Crossbred cattle	18.1	102.0	120.1
	Non descriptive Buffaloes (local low yielding)	1.7	14.5	16.3
	Graded Buffaloes	43.5	332.1	375.7
	Goat	21.2	11.4	32.7
	Sheep	18.9	35.2	54.2
	Others Equine (Horse & Pony)	0.9	0.8	1.8
Commercial dairy farms (Number)			0.08	
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	67	161.1	
	Backyard	-	14.9	

1.10	Fisheries (Data source: Chief Planning Officer of district)						
	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	
		230		-		288	
	B. Culture						
		Water Spread Area (ha)	Yield (t/ha)		Production ('000 tons)		

	i) Brackish water (Data Source: MPEDA/ Fisheries Department)	675	8.1	5.5
	ii) Fresh water (Data Source: Fisheries 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	<i>Kharif</i>		<i>Rabi</i>		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)							
Major Field crops (Crops to be identified based on total acreage)										
	Rice	11000	4043	-	-	-	-	11000	4043	-
	Wheat	-	-	15733	4681	-	-	15733	4681	-
	Moong	160	-	-	-	-	-	160		-
	Rapeseed & Mustard	-	-	700	1625	-	-	700	1625	-
	Cotton	8050	688	-	-	-	-	8050	688	-
	Barley	-	-	1800	3659	-	-	1800	3659	-
	Gram	-	-	150	1145	-	-	150	1145	-
Others	Sugarcane	600	5994	-	-	-	-	600	5994	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Kinnow	35918000	24450	-	-	-	-	-	24450	-
	Orange & Malta	1430000	8190	-	-	-	-	-	8190	-
	Guava	1235600	21140	-	-	-	-	-	21140	-
	Ber	434600	17144	-	-	-	-	-	17144	-

1.12	Sowing window for 5 major field crops	Paddy	Wheat	Cotton	Oilseeds
	<i>Kharif</i> - Rainfed	-	-	-	-
	<i>Kharif</i> -Irrigated	2 nd week of June to 1 st week of July	-	2 nd week April to 4 th week May	-
	<i>Rabi</i> - Rainfed	-	-	-	-
	<i>Rabi</i> -Irrigated	-	4 th week October to 1 st week December.	-	2 nd week October to 1 st week December.

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 (Yellow rust on wheat, BLB on paddy, Late blight on potato, Sucking pests like aphids, jassid, whitefly, Mealy bug in cotton)	-	✓	-
Others Yellow vein mosaic virus in Mungbean	-	✓	-	

1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: - Yes
		Mean annual rainfall as Annexure 2	Enclosed:- NO
		Soil map as Annexure 3	Enclosed:- NO

Annexure I

Location map of Fazilka district within Punjab State



2.0 Strategies for weather related contingencies

2.1 Drought: N A

2.1.1 Rainfed situation: N A

2.1.2 Irrigated 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
Delayed/ limited release of water in canals due to low rainfall	Canal / Tubewell irrigated alluvial soils	Cotton - Wheat Rice – Wheat	Rapeseed/Mustard	<p>A. Cotton:</p> <ul style="list-style-type: none"> i. Ridge planting with each furrow irrigation. ii. Gap filling by transplanting 21 days old cotton seedlings. iii. Alternate furrow irrigation with poor quality Tube well water after PSI with Canal water. <p>B. Rice:</p> <ul style="list-style-type: none"> i. Grow short duration varieties like PR 115 ii. Basmati plantation of Pusa-Basmati 1121 <p>C. Wheat:</p> <ul style="list-style-type: none"> i. Grow late sown varieties like PBW 590 and PBW 509 ii. Bi-directional sowing / Bed planting iii. Closed spacing (7.5x22.5 cms) iv. Seed priming <p>D. Rapeseed-mustard Prefer raya var. PBR-97 under scarce water supply.</p>	-

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			N A		

2.2 Un-timely (unseasonal) rains

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Heavy rainfall with high speed winds in a short span				
Cotton	Ridge planting, draining out excess rain water	Draining out excess rain water, application of nitrogenous fertilizer, foliar spray of KNO ₃ @ 2 %.	Draining out excess rain water and chemical control of pests / diseases	Storage of produce at safer place
Rice	Draining out excess rain water, Nitrogenous fertilizer application	Draining out excess rain water.	Draining out excess rain water	Shifting of produce at safer place for drying.
Wheat	Bed / bidirectional sowing, draining out excess rain water, apply Nitrogenous fertilizer and Gypsum (100 kg/acre) to check nitrogen & sulphur deficiency, respectively	Draining out excess rain water, foliar spray of 3% urea solution	-do-	-do-
Horticulture				
Citrus	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 GA ₃ to check fruit drop due to water-imbalance	Drain out excess water,
Ber		Control of powdery mildew (spray karathane /bayleton @ 0.5 g/liter or sulfur @ 2.5 g/liter	Control of powdery mildew (spray karathane /bayleton @0.5 g/liter or sulfur @ 2.5 g/liter	Shifting and storage of rainy season harvested fruits at proper place
Guava	Drainage of excess water, raising of soil surface around the tree trunks	Drain out excess rain water		Shifting and storage of harvested fruits at proper place
Potato	Manual weed control, earthing up and apply second dose of nitrogen. Drainage of excess	Drain out excess water, spray ridomil @ 1 g/ lit to check late blight		Curing of potatoes should be done properly.

	water			
Chilli	-	Draining out of excess rain water to check wilt	Spray blitox @ 5 g/ l water to check rotting of fruit	Keep in dry place
Cucurbits	-	Spray indofil M-45 @ 3 g/l water against downy mildew	Spray blitax @ 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	-
Outbreak of pests and diseases due to unseasonal rains				
Cotton	Spray larwin @ 250g or ekalux 800 ml/acre to check Mealy bug	<p>Insect/Pests: Spray imidacloprid 40 ml/ pride 20 ml/acre for Jassid; hostathion 600 ml/acrea gainst white fly; larwin @ 250 g or ekalux 800 ml/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>Diseases: Grow LH 144/LH 2076 against leaf curl; cobalt chloride (CoCl₂) to check para wilt, spray blitox + streptomycin 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 1@ 560 ml/acre against leaf folder and stem borer.	<p>Insect/Pests: Spray nuvacron /monocil@ 560 ml/acre against leaf folder and stem borer; confidor @40 ml/acre/ ekalux @ 800 ml/acre against plant hoppers/ rice ear cutting caterpillar.</p> <p>Diseases: Grow PR 120, PR 111 against bacterial leaf blight (BLB); spray blitox (500 ml) /tilt (200 ml) per acre to control false smut; Spray tilt @ 200m l/acre against sheath blight, sheath rot and bunt diseases.</p>		Storage of produce in dry place
Wheat	Spray pesticide to control Pink boll worm especially in rice fields.	Spray nuvacron @ 150 ml/acre to control sucking pest (aphid)	Spray nuvacron @ 150 ml/acre to control aphid, ekalux for army worm (@ 400 ml); boll worm (800 ml) per acre and tilt @ 200 ml/acre to check karnel bunt & rusts.	Treat the produce meant for seed with 250 gm malathion dust (5%) and disinfest 10gunny bags with 5 ml cymbush /10 litres water, Godowns with 100 ml malathion /10 litres water.

Rapeseed - mustard	Drain out excess rain water, Nitrogenous fertilizer application	Drain out excess rain water		Shifting of produce at safer place for drying
Horticulture				
Citrus	Chemical control of phytophthora / foot rot with Ridomil-MZ/ Alliette as per recommendation, Control of sucking pests with systemic pesticides	Chemical control of phytophthora / foot rot with Ridomil-MZ/ Alliette as per recommendation, Control of sucking pests with systemic pesticides	Chemical control of phytophthora / foot rot with Ridomil-MZ/ Alliette as per recommendation, Control of sucking pests with systemic pesticides	Application of fungicides/ nutrients to check post harvest losses
Guava	Chemical control 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.
Chilli	-	Pumping out of excess rain water to check wilt	Spray Blitox @ 5 g/ 1 water to check rotting of fruit	Keep in dry place
Cucurbits	-	Spray Indofil M 45 @ 3 g/l water against downy mildew	Spray Blitox @ 5 g/ 1 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	-

2.3 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Cotton	Heavy rauni (psi) with canal water, planting of crop on eastern side of N-S ridge, gap filling and light irrigation	Apply light irrigation	NA	NA
Rice	Correct Iron deficiency with 0.5 per cent iron sulphate spray, light and frequent	Pounding of water for fifteen days after transplanting to check iron deficiency and for crop	NA	NA

	irrigation	establishment		
Wheat	NA	NA	Apply light irrigation	NA
Rapeseed-mustard	NA	NA	NA	NA
Horticulture				
Citrus	Light and frequent irrigation and shelter from western side to check sun scald and burning injury, application of white paint on main stems,	Apply light and frequent irrigation to check Dropping of flowers and fruit with growth regulator like 2-4-D/GA.		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
Chilli	Mulching and frequent irrigation	Mulching and frequent irrigation	Mulching and frequent irrigation	NA
Cold wave				
Field Crops	N A			
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
Sweet pepper	Provide shelter with sarkanda or cover crop with polythene in low tunnel	-	-	
Tomato	-do-	-	-	
Frost				
Wheat			Apply light irrigation	
Horticulture				
Citrus	New plantation and cover the plants with grass or sarkanda etc	Installation of wind breaks, smoking etc.		NA
Potato	-	Apply light irrigation or use sprinkler irrigation mid night		-
Capsicum	Apply light irrigation or cover the crop with Polythene, sarkanda.	-	-	-
Hailstorm				

Cotton	Re-sowing	Not curable	Not curable	-
Rice	Re-transplanting	-do-	-do-	-
Wheat	Re-sowing	-do-	-do-	-
Horticulture				
Citrus	Protection of nursery with sarkanda etc/ growing of nursery under protected structures.	Removal of broken limbs Apply light irrigation and spray fungicide to check fungal infection with blitox, Bordeaux mixture etc.		NA
Cucurbit	Re sowing or re-transplanting	Apply light irrigation and sprays fungicide		-
Tomato	-do-	-do-		-

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>			
Feed and fodder availability	<p>As the district is occasionally prone to drought the following measures to be taken to ameliorate the fodder deficiency</p> <p>Avoid burning of wheat/paddy straw</p> <p>Establishment of fodder bank at village level with available dry fodder (paddy /wheat straw)</p> <p>Increase area under perennial fodder cultivation with high yielding Hybrid Napier varieties.</p> <p>Conservation of maize green fodder as silage</p> <p>Sowing of cereals (Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder</p>	<p>Harvest and use biomass of dried up crops (paddy/wheat/barley/maize/mungbean etc..) material as fodder</p> <p>Utilizing fodder from fodder bank reserves.</p> <p>Utilizing stored silage/hay.</p> <p>Transporting complete feed/fodder and dry roughages to the affected areas.</p> <p>Concentrate ingredients such as grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p>	<p>Training/educating farmers for feed & fodder storage.</p> <p>Maintenance / repair of silo pits and feed/fodder stores.</p> <p>Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall etc.,</p> <p>Supply of quality fodder seed (multi cut sorghum/bajra/maize varieties) and fodder slips of</p>

	<p>production</p> <p>Encourage fodder production with Maize, Jowar, Bajra , Cowpea, Makkchari, Barseem, Jawi, Rayi grass, Lucerne and Japense grass</p> <p>Processing & storage of feed/fodder and roughages in the form of complete feed/blocks.</p>	<p>Continuous supplementation of mineral mixture to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p>	<p>Napier, guinea grass well before monsoon</p> <p>Replenish the feed and fodder banks</p>
Drinking water	<p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>Desilting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in shandies /community grazing areas</p>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources</p> <p>Add alum in stagnated water bodies</p>	<p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>
Health and disease management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures</p> <p>Procure and stock multivitamins & area specific mineral</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Tick control measures be undertaken to prevent tick</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide</p>

	mixture	borne diseases in animals Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	with mid summer
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 / fodders 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</p> <p>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 (1 kg for small ruminants and 5 kg for large ruminants) in pit</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p>
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 10 AM to 3 PM 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> <ul style="list-style-type: none"> i) Plantation around the shed ii) H₂O sprinklers / foggers in the shed iii) Application of white reflector paint on the roof iv) Thatched sheds should be provided as a shelter to animal to minimize heat stress 	<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				
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice, barley etc, Culling of weak birds	Supplementation for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds	Supplementation to all the birds	
Drinking water	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement	
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and fowl pox	Mixing of Vit. A, D, E, K and B-complex including vit C in drinking water	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit	
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 a cyclone prone district.			
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 Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening	Routine practices are followed	
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/ponds. v) Re-excavation of local canals/village ponds. 	<ul style="list-style-type: none"> i) Use stored water. ii) Use surface water flow. iii) Divert water from unutilized areas. iv) Utilize canal water. v) Aeration of water in ponds/reservoirs. 	<ul style="list-style-type: none"> i) Need based monitoring through research plan. ii) Intensive afforestation program. iii) Augmentation of surface water flow. iv) Strengthening of water sources. v) Rain water harvesting . vi) Compensation claims. vii) Prepare vulnerability map.
(ii) Changes in water quality	<ul style="list-style-type: none"> i) Prohibit dumping of solid, liquid and waste in water sources. ii) Preparedness with stocks of chemicals, disinfectants and therapeutic drugs. 	<ul style="list-style-type: none"> i) Adopt suitable action plan to reduce salt load in water bodies. ii) Generate scientific research data on the survival and tolerance limit of fish and prawn species in saline water. iii) Use disinfectants and therapeutic drugs. iv) Adoption of bio-remedial measures 	<ul style="list-style-type: none"> i) Need based research data should be generated on water quality. ii) Dumping of solid, liquid and waste in water bodies should be stopped through enactment of legislation.
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none">) Critical analysis of long range forecast data. ii) Storage of water. iii) Afforestation program. iv) Conservation of water. v) Re-excavation of local canals/village ponds. 	<ul style="list-style-type: none"> i) Use stored water. ii) Use surface water flow. iii) Divert water from unutilized areas. iv) Utilize canal water. v) Aeration of 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) Adoption of rain

			harvesting methods. v) Compensation claims. vi) Prepare vulnerability map.
(ii) Impact of salt load build up in ponds/Changes in water quality	i) Prohibit dumping of solid, liquid and waste in water sources. ii) Preparedness with stocks of chemicals, disinfectants and therapeutic drugs.	i) Adopt suitable action plan to reduce salt load in water bodies. ii) Generate scientific research data on the survival and tolerance limit of fish and prawn species in saline water. iii) Use disinfectants and therapeutic drugs. iv) Adoption of bio-remedial measures	i) Need based research data should be generated on water quality. ii) Dumping of solid, liquid and waste should be stopped through enactment of legislation.
2. Flood	Not a flood affected district.		
A. Capture			
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 disease	-	-	-
B. Aquaculture	-	-	-
(i) Inundation with flood water	-	-	-
(ii) Water contamination and changes in water quality	-	-	-
(iii) Health and diseases	-	-	-
(iv) Loss of stock and input (feed, chemicals)	-	-	-
(v) Infrastructure damage (pumps, aerators, huts etc)	-	-	-
3. Cyclone / Tsunami	Not a cyclone affected district.		
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.)	-	-	-
4. Heat wave and cold wave	-	-	-
A. Capture	-	-	-
Marine	-	-	-
Inland	<ul style="list-style-type: none"> i) Stay aware of upcoming temperature changes. ii) Arrange the aerators. iii) Ensure sufficient water level in water bodies. vi) Formulate strategic fishing management during the heat/ 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) Educating the farmers through electronic or print media iv) Collect basic weather data on incidence of extremes and physical data of water bodies, water chemistry and seasonal changes, plankton profile and seasonal blooms, topography and soil composition. 	<ul style="list-style-type: none"> i) Intensive afforestation program for reducing heat waves. ii) Gather information about history of catch per unit effort as well as fish yield rate during heat/ cold wave and accordingly simulate future plan for sustainable fishing. iii) 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 for the heat /cold waves. v) Tree plantation around fish ponds 	<ul style="list-style-type: none"> i) Adopt suitable action plan to reduce salt load in water bodies. ii) Generate scientific research data on the survival and tolerance limit of fish and prawn species in saline water. iii) Monitor fishing sites frequently to ensure that they are not affected by heat or cold waves. iv) Use dark materials to cover the water bodies during excessive heat waves. v) Educating the farmers through 	<ul style="list-style-type: none"> i) Intensive afforestation program for reducing heat waves. ii) 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. vi) Loss assessment & insurance claim.

		<p>electronic / print media.</p> <p>vi) Collect basic weather data on incidence of extremes and physical data of water bodies, water chemistry and seasonal changes, plankton profile and seasonal blooms, topography and soil composition.</p>	
(ii) Health and disease management	<p>i) Advance planning and preparedness.</p> <p>ii) Store chemicals, disinfectants and therapeutic drugs.</p> <p>iii) Develop heat/ cold wave control management plan.</p> <p>iv) Stock sufficient emergency medicines.</p>	<p>i) Identification of type of disease outbreak, immediate removal of disease causing agents/ dead fish.</p> <p>ii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs.</p> <p>iii) Determination of nature and speed of transmission of diseases.</p> <p>vi) Emergency aeration or splashing in water bodies</p>	<p>i) Laboratory diagnosis of diseased fish, generation of data about type or kind of disease spread.</p> <p>ii) Eradicating the disease.</p> <p>iii) Follow up surveillance and monitoring.</p> <p>iv) Proper disposal of dead fish.</p> <p>v) Loss assessment & insurance claim.</p>