

State: Jharkhand

Agriculture Contingency Plan for District: Lohardaga

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Moderately To Gently Sloping Chattisgarh Mahanadi Basin, Hot Moist/Dry Sub humid Transitional ESR With Deep Loamy To Clayey Red And Yellow Soils (11.0)		
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau And Hills Region (VII)		
	Agro Climatic Zone (NARP)	Western Plateau Zone (BI-5)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Chatra, Garhwa, Gumla, Hazaribagh, Khunti, Latehar, Loharganda, Palamu, W. singbhum, Ranchi, Simdehga		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		23°30' and 23°40' N	84°40' and 84°50' E	210 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Research Station (ZRS), Chianki, Birsa Agricultural University, Ranchi		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Old D.K.G.K. Office, PO. Lohardanga, Distt. Lohardaga-834006		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	ZRS, Chianki			

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1011		3 rd week of June	3 rd week of September
	NE Monsoon(Oct-Dec):	102			
	Winter (Jan- Feb)	38		-	-
	Summer (Mar-May)	75		-	-
	Annual	1228		-	-

1.3	Land use pattern of the district	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)	148.3	39.3	44.4	-	0.06	4.9	-	9.1	20.5	20.6

1.4	Major Soils	Area ('000 ha)	Percent (%) of total
	1. Red lateritic (Ultic Paleustalfs) soils		
	2. Loam soils (Haplustalfs)		
	3. Fine Loam (Rhodustlafs) soils		
	4. Fine mixed Loam (Paleustalfs) soils		

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	39.3	108%
	Area sown more than once	10.5	
	Gross cropped area	49.9	

1.6	Irrigation	Area ('000 ha)

Net irrigated area	5.7		
Gross irrigated area			
Rainfed area			
Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
Canals		0.7	
Tanks		0.07	
Open wells		1.8	
Bore wells		2.05	
Lift irrigation schemes			
Micro-irrigation			
Other sources (Check Dam)		1.07	
Total Irrigated Area			
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

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			28.8					28.8
	Maize			5.9			0.3		7.2
	Pigeonpea			3.4					3.4
	Blackgram			3.8					3.8
	Greengram			0.2					0.2
	Wheat						2.9		2.9

	Chick pea						1.2		1.2
	Pea						4		4
	Lentil						0.2		0.2

Horticulture crops - Vegetables	Total	Irrigated	Rainfed
Cauliflower	1.0		
Cabbage	1.0		
Tomato	1.0		
Brinjal	0.4		
Chilli	0.7		
Ladies finger	0.3		
Bottle gourd	0.4		
Bitter gourd	0.5		
Cucumber	0.1		
Ridge gourd	0.2		
Sponge gourd	0.3		
French bean	0.1		
Medicinal and Aromatic crops			
Plantation crops			
Fodder crops			
Total fodder crop area			
Grazing land			
Sericulture etc			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)			132.4
	Improved cattle			
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)			
	Descript Buffaloes			12.2
	Goat			86.5
	Sheep			1.5
	Others (Camel, Pig, Yak etc.)			9.9
	Duckery			
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds ('000)	

	Commercial								
	Backyard							254.3	
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)								

1.11 Production and Productivity of major crops

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 identified based on total acreage)										
	Rice	47.7	1660					47.7	1660	
	Maize	9.8	1680	0.4	1764			10.2	1722	

	Pigeonpea	1.3	400					1.3	400	
	Blackgram	2.1	560					2.1	560	
	Greengram	0.11	630					0.11	630	
	Wheat			4.18	1414			4.18	1414	
	Chick pea			0.8	660			0.8	660	
	Pea			3.5	1110			3.5	1110	
	Lentil			0.07	415			0.07	415	
Major Horticultural crops (Crops identified based on total acreage)										
	Cauliflower	31.3	0.2					31.3	0.2	
	Cabbage	26.3	0.2					26.3	0.2	
	Tomato	23.3	0.2					23.3	0.2	
	Brinjal	11.8	0.3					11.8	0.3	
	Chilli	0.5	0.09					0.5	0.09	
	Ladies finger	8.0	0.17					8.0	0.17	
	Bottle gourd	60.0	0.13					60.0	0.13	

1.12	Sowing window for 5 major field crops	Rice	Blackgram	Pigeon pea	Maize	Wheat
	Kharif- Rainfed	4 th week of June to 4 th week of July	3 rd week of June to 4 th week of June	3 rd week of June to 2 nd week of July	3 rd week of June to 4 th week of July	
	Kharif-Irrigated	2 nd week of June to 3 rd week of June				

	Rabi-Rainfed					3 rd week of October to 4 th week of October
	Rabi-Irrigated					3 rd week of November to 4 th week of December

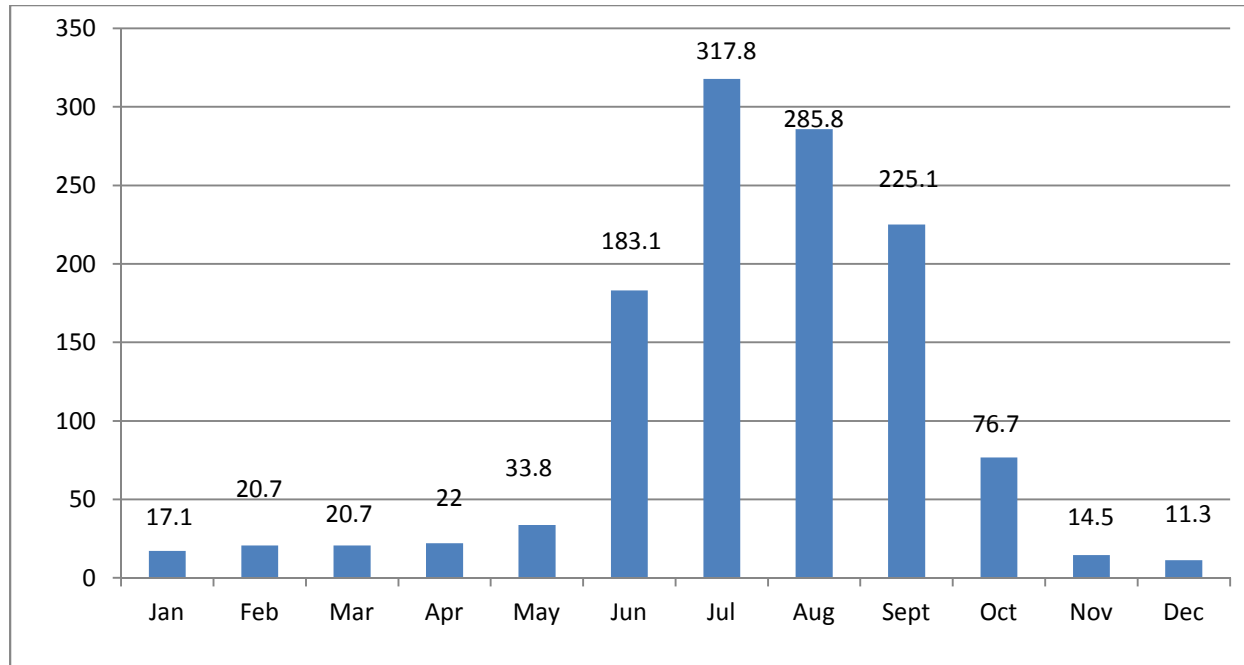
1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	✓		
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave		✓	
	Cold wave		✓	
	Frost		✓	
	Sea water intrusion			✓
	Pests and disease outbreak		✓	

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 II	Enclosed: Yes
		Soil map as Annexure III	Enclosed: Yes

Annexure I



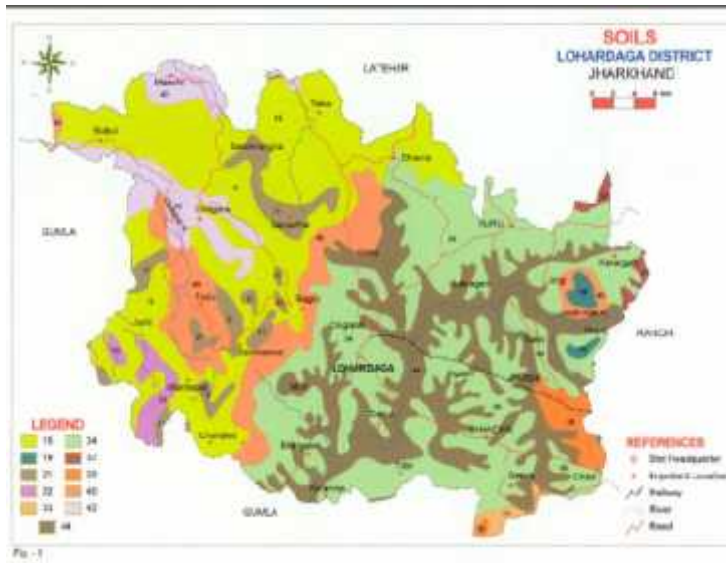
Annexure II



Annexure III

Legend Information:-

- 15- Shallow excessively drained gravelly loamy soils
- 19- Shallow, excessively drained, gravelly loamy soils
- 21- Deep excessively drained coarse loamy soils
- 22- Deep moderately well drained fine soils
- 33- Very Deep moderately well drained fine loamy soils
- 34- Very deep, well drained, fine loamy soils with severe erosion
- 37- Shallow well drained, loamy soils
- 39- Deep moderately well drained fine soils.
- 40- Deep, moderately well drained, fine loamy soils
- 42- Deep moderately drained, fine soils
- 44- Very deep poorly drained fine soils



Source: SAMETI, Jharkhand

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed 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 1 st week of July	Upland sandy loam soils	Pigeonpea + Maize, Rice Blackgram	Pigeonpea + Okra Pigeonpea + Sorghum Pigeonpea , Birsa Arhar – 1, Bahar, local Okra – Pravani kranti, Arka Anamika A – 4 Sorghum – CSV – 20, CSV - 17 Hybrid	Follow wider spacing (75X 25 cm) in Pigeonpea Seed treatment Integrated pest management	
	Medium land medium deep sandy loam soils	Rice	Rice – Naveen, shabhagi		
	Low land deep clay soils	Rice	Hybrid Rice - PAC – 807, Uday – 111, 27P31, Arize – 6444		

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Early season drought (delayed onset) Delay by 4 weeks 3 rd week of July	Upland sandy loam soils	Pigeonpea + Maize, Rice, Blackgram	Pigeonpea + Okra Pigeonpea + Sorghum Pigeonpea , Birsa Arhar – 1, Bahar, local Okra – Pravani kranti, Arka Anamika A – 4 Sorghum – CSV – 20, CSV - 17 Hybrid	Line sowing Wider spacing of (75X 25 cm) Pigeonpea Use of potash fertilizer, Seed treatment,	Supply of seeds through D.A.O. and N.F.S.M.
	Medium land medium deep sandy loam soils	Rice	Rice – Naveen, shabhagi		

	Low land deep clay soils	Rice	Hybrid Rice - PAC – 807, Uday – 111, 27P31, Arize – 6444		
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Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 6 weeks 1 st week of August	Upland sandy loam soils	Pigeonpea + Maize, Rice, Blackgram	Pigeonpea + Okra Pigeonpea + Sorghum Pigeonpea , Birsa Arhar – 1, Bahar, local Okra – Pravani kranti, Arka Anamika A – 4 Sorghum – CSV – 20, CSV - 17 Hybrid	Line sowing , Wider spacing of (75X 25 cm) Pigeonpea Use of potash fertilizer, Seed treatment	Supply of seeds through D.A.O. and N.F.S.M.
	Medium land medium deep sandy loam soils	Rice	Rice – Naveen, shabhagi		
	Low land deep clay soils	Rice	Hybrid Rice - PAC – 807, Uday – 111, 27P31, Arize – 6444		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 8 weeks 3 rd week of August	Upland sandy loam soils	Finger millet	Toria Toria – Bhawani, Panchali, Pant Toria – 303, Lotni (Local)	In Finger millet : Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying, Thinning to retain one seedling at 30 cm Inter cultivation, Conservation furrow	Supply of seeds through D.A.O. and N.F.S.M.
		Niger	Hybrid Pigeonpea–ICPH - 2671		

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation	Remarks on Implementation

				measures	
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	Upland sandy loam soils	Pigeonpea + Maize, Rice, Blackgram	Pigeonpea + Okra Pigeonpea + Sorghum Pigeonpea , Birsa Arhar – 1, Bahar, local Okra – Pravani kranti, Arka Anamika A – 4 Sorghum – CSV – 20, CSV - 17 Hybrid	Soil mulching Gap filling Re Sowing Conservation furrow	
	Medium land medium deep sandy loam soils	Rice			
	Low land deep clay soils	Rice			

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Upland sandy loam soils	Maize + Pigeonpea, Pigeonpea + Sesame, Maize + Groundnut/Cowpea Fingermillet, Blackgram	Life saving irrigation, Weeding cum – hoeing to break capillarity	Application of compost to enhance the water holding capacity of soil, Judicious land of P for better penetration of root system Weeding and weed mulching of the field Pre sowig application of compost and Judicious land of P&K for better water holding and root growth.	Supply of Pumps (Sprinkler) sets under RKVY
	Medium land medium deep sandy loam soils	Rice	Life saving irrigation through Pumps and sprinkler.		
	Low land deep clay soils	Rice	Life saving irrigation through Pumps		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation meausues	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/	Upland sandy	Maize + Pigeonpea,	Life saving irrigation	Intercultivation (soil	Supply of irrigation

fruiting stage	loam soils	Maize + Blackgram, Pigeonpea + Sesame, Maize + Groundnut, Pigeonpea + Groundnut, Finger millet	through sprinkler system Weed – cum – hoeing and weed mulching	mulching) Conservation Furrow	devices under RKVY.
	Medium land medium deep sandy loam soils	Rice	Life saving irrigation by lifting the water from ponds/ wells		
	Low land deep clay soils	Rice	Life saving irrigation through Pumps/Ponds/wells.		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Upland sandy loam soils	Maize + Pigeonpea / Blackgram/ Groundnut/ Cowpea , Pigeonpea + Sesame, Finger millet	Life saving irrigation, Harvesting of pods of Cowpea and Blackgram for vegetable purpose and fodder.	Niger, Rai, Chickpea, Linseed. Rai + Wheat, Linseed + Horsegram, Wheat + Mustard, Lentil, Niger, Toria, Chickpea, Vegetables like – Tomato, Vegetable pea, Potato.	Supply of Pumps (Sprinkler) sets under RKVY Seeds and planting materials supply under RKVY, Ponds/wells under MNREGS and RKVY.
	Medium land medium deep sandy loam soils	Rice	Life saving irrigation		
	Low land deep clay soils	Long duration rice varieties and hybrids.	Life saving irrigation,		

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
Limited release of water in canals due to low rainfall					

Condition	Suggested Contingency measures				
	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					
Lack of inflows into tanks due to insufficient /delayed onset of monsoon					
Insufficient groundwater recharge due to low rainfall					

2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed 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				
Pigeonpea	Ridge making	Provide drainage		
Blackgram	Ridge making	Provide drainage		
Rice	Bund making	Provide drainage	Provide drainage	
Horticulture				
Cucurbits	Staking	Provide drainage	Provide drainage	
Vegetables	Sowing on ridge			

Outbreak of pests and diseases due to unseasonal rains				
Pulses	Leaf hoper/caterpillar Control- Monocrotophos @ 1 ml/lit			
Maize	Stem borer Control- Phorate 10G@ 20 kg/ha	Sheath blight Control- Hexaconazole 1.0 lit in 500 lit water/ha		
Rice		Blast diseases Control- Tricyclazole (0.05 %)	False Smut Control- Propiconazole 0.1 % or Copper oxy chloride -50 (2 kg/ha)	
Bhendi		YVM Control- Carbofuran 3G @ 3 gm/m ²		
French bean	Rust disease Control- Mancozeb 2.5 kg/ha			

2.3 Floods

Condition	Suggested contingency measure ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
Continuous submergence for more than 2 days ²		Not Applicable		
Sea water intrusion ³				

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Hailstorm	Not applicable			

Heat Wave				
Wheat	Life saving irrigation	Life saving irrigation	Life saving irrigation (Terminal heat)	
Cold wave				
Wheat	Irrigation Balanced fertilizer application Foliar spray of nutrients	Light irrigation Mulching with crop residue \ weeds Fertilizer application	Irrigation, fertilizer application	
Vegetables	Raising of seedling in Poly house, re sowing if damaged	Light irrigation Mulching with crop residue \ weeds Disease and pest control, care for chilling injury or replanting	Quick harvesting	Grading, quick disposal for marketing
Pigeonpea		Light irrigation Mulching with crop residue \ weeds		
Frost				
Wheat		Light irrigation Mulching with crop residue \ weeds		
Pigeonpea	Exposure of crop to smoke by burning waste material during night time	Exposure of crop to smoke by burning waste material during night time Light sprinkler irrigation	Exposure of crop to smoke by burning waste material during night time Light sprinkler irrigation	Exposure of crop to smoke by burning waste material during night time
Tomato & Potato		Earth up to 15cm ht. Irrigation Intercultivation, Mulching with weeds		Harvest in dry weather
Horticultural crops (fruit	Light frequent irrigation may be practiced wherever irrigation facilities are available, mulching, thatching and creating			

crops)	smoke screens and lighting of fire is also practiced where irrigation facilities are not available
Cyclone	Not applicable

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Drought			
Feed and fodder availability	Preservation of surplus fodder, encourage fodder cultivation and tree plantation and also encourage supply of molasses to cattle feed plants.	Arrangement of feeds and fodder from adjoining areas, exploitation of non conventional feed resources, use of urea treated straw and feed blocks.	Promotion of fodder seed production, cultivation and storage, establishment of fodder block making machines in fodder surplus areas.
Drinking water	Repairs of tube wells, clear off the sludge in the canals and local water catchments and clean the water tanks, large ponds and lakes	Harnessing water through the existing reservoirs and exploitation of groundwater.	To strengthen reservoirs by promoting recharging of water and rain water harvesting during rainy season.
Health and disease management	Mass vaccination and deworming	Provide shades to animals and water as much as possible. Treatment of diseased animals and proper disposal of carcasses.	Treatment of diseased animals and provide vitamin and mineral supplement to regain strength and vigour.

^s based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event ^a	During the event	After the event	
Drought				
Shortage of feed ingredients	Storage of feed	Provide non conventional feed, supplement anti oxidant and anti stress		

Drinking water	Storage of water in tanks	Add vit-C and other anti stress ingredients with water		
Health and disease management	Regular vaccination	Vaccination and treatment of diseased one	Disposal of dead birds	

^a based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1. Drought			
Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Plough the pond and apply lime @ 250kg/ha	Reduce the stocking density from 25000 fry (1 inches size) to 10000-15000/ha	Remove the fishes of bigger size(0.5 kg)
(ii) Impact of salt load build up in ponds / change in water quality		Apply lime @ 50 kg on every 15-30 days. Aerate the water as per need	Apply lime as per need @ 50 kg/ha
2. Heat wave and cold wave			
Aquaculture			
(i) Changes in pond environment (water quality)	Reduce application of organic manure and supplementary feeds	Reduce/stop application of feed	Harvest the bigger fishes, reduce/stop application of supplementary feed. Apply lime @ 50 kg/ha and potassium permanganate in perforated plastic ball 5-10g in each ball
(ii) Health and Disease management	Apply lime	Apply lime/salt as per need	Apply lime/salt as per need.

^a based on forewarning wherever available