State: ARUNACHAL PRADESH
Agriculture Contingency Plan for District: LOHIT

1.0 District Agriculture profile*				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Eastern Himalayas, Warm Perhumid Eco-sub region (16.3)		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region (II)		
	Agro Climatic Zone (NARP)	Sub-Tropical Hill Zone (NEH-3)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Lohit, Twang		
	Geographic coordinates of district headquarters head quarters	**Latitude**	**Longitude**	**Altitude**
		27^0 30' to 28^0 45' N	$95^0$45' to $96^0$45' E	210 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ICAR, Basar. Arunachal Pradesh		
	Mention the KVK located in the district with full address	KVK, Momong, Lohit-District		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	ICAR Research Complex for NEH Region, Arunachal Pradesh Center, Basar, West Siang District-791101, Arunachal Pradesh.		

Lohit-dist. at a glance, 2009, District Statistical office, Lohit- dist., Tezu, Arunachal Pradesh-792001

1.2	**Rainfall**	**Normal RF(mm)**	**Normal Onset**	**Normal Cessation**
	SW monsoon (June-Sep):	1380	1st week of June	2nd week of October
	NE Monsoon(Oct-Dec):	165.8	3rd week of October	2nd week of November
	Winter (Jan- February)	113.4	-	-
	Summer (March-May)	649.9	-	-
	Annual	2309.1	-	-

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 (000ha)	521	41.9	10.3	1.6	NA	2.0	NA	48.9	2.2	1.5

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)****	**Percent (%) of total geographical area**
	Black Soils	145.6	12.7
	Alluvial Soils	20.7	1.8
	Sandy Soils	365.88	32.9
	Acid Soils	518.20	45.4

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	41.9	100 %
	Area sown more than once	-	
	Gross cropped area	41.9	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	3.53		
	Gross irrigated area	4.20		
	Rainfed area	32.69		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	68	-	Area may be indicated
	Tanks	0	-	-
	Open wells	5	-	-
	Bore wells	0	-	-
	Lift irrigation schemes	-	-	-

	Micro-irrigation	-	-	-
	Other sources (Spring water well)	2	-	-
	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	No	-	-
	Critical	No	-	-
	Semi- critical	No	-	-
	Safe	8	100	-
	Wastewater availability and use	-	< 70	-
	Ground water quality	-		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Lohit-dist. at a glance, 2009, District Statistical office, Lohit- dist., Tezu, Arunachal Pradesh-792001

1.7 Area under major field crops & horticulture

1.7	**Major field crops cultivated**	**Area (ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Paddy	-	-	-	-	-	-	-	10500
	Maize	-	-	-	-	-	-	-	8024
	Oil Seed	-	-	-	-	-	-	-	11430
	Pulses	-	-	-	-	-	-	-	1559

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Orange	2175.89	-	-
	Pineapple	135.38	-	-
	Banana	111.29	-	-
	Litchi	34.90	-	-
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**

	Vegetable	2010	-	-
	Potato	625	-	-
	Ginger	895	-	-
	Medicinal and Aromatic crops	-	-	-
	Plantation crops	-	-	-
	Eg., industrial pulpwood crops etc.	-	-	-
	Fodder crops	-	-	-
	Total fodder crop area	-	-	-
	Grazing land, reserve areas etc	2100 ha	-	-
	Availability of unconventional feeds/by products eg., breweries waste, food processing, fermented feeds bamboo shoots, fish etc	-	-	-
	Sericulture etc Other agro enterprises (mushroom cultivation etc specify)	2 units	-	-
	Others (specify)	-	-	-

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Indigenous cattle	30.87	33.47	64.34
	Improved / Crossbred cattle	0.23	0.68	0.91
	Buffaloes (local low yielding)	0.53	0.90	195
	Improved Buffaloes	-	-	-
	Goat	10.9	17.98	28.89
	Sheep	-	-	-
	Pig	7.37	7.3	14.74
	Mithun	0.57	1.1	1.6
	Yak	-	-	-
	Others (Horse, mule, donkey etc., specify)	-	-	-
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	30	20	
	Backyard	-	92.03	

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**		
		398				**13**		
	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)			82		1.59	130	
	Others (River/Stream)			-		-	200	

1.11 Production and Productivity of major crops (Average of last 5 years)

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Rice	-	-	-	-	-	-	20916.5	19.87	-
	Oilseed (specify)	-	-	-	-	-	-	9459.5	8.28	-
	Maize	-	-	-	-	-	-	10038	12.31	-
	Pulses	-	-	-	-	-	-	2163	12.77	-

	(specify)									
	Ginger	-	-	-	-	-	-	7309	81.90	-
		-	-	-	-	-	-	-	-	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Orange	-	-	-	-	-	-	22804.25	11.03	-
	Pineapple	-	-	-	-	-	-	5074.4	37.48	
	Banana	-	-	-	--	-	-	10999.5	99.24	-
	Litchi	-	-	-	-	-	-	550	15.75	-
	Papaya	-	-	-	-	-	-	290	17.49	-
	Mango	-	-	-	-	--	-	441	88.20	-

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Maize**	**Mustard**	**Potato**	**Pulses** (specify)
	Kharif- Rainfed	June-August	February-April	-	-	August-September
	Kharif-Irrigated	June- August	-	-	-	-
	Rabi- Rainfed	February-March	September-October	October-November	October-December	October-November
	Rabi-Irrigated	February-March		-	-	-
	Summer-irrigated	-	-	-	-	-
	Summer-rainfed	-	-	-	-	-

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			√

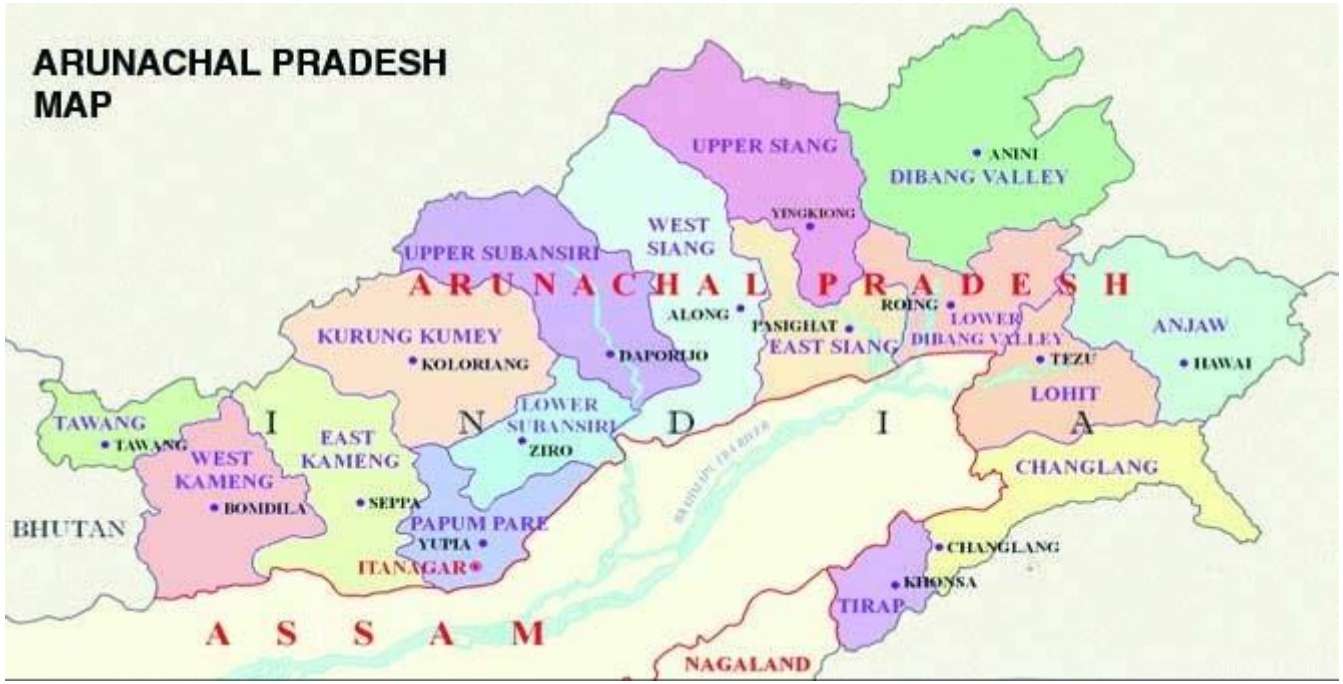
	Sea water intrusion			√
	Snowfall			√
	Landslides			√
	Earthquake		√	
	Pests and disease outbreak (specify)		√	
	Others (like fog, cloud bursting etc.)			

*When contingency occurs in six out of 10 years

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

Annexure I

Location map of Lohit in Arunachal Pradesh



Annexure-II:

MEAN ANNUAL RAINFALL OF LOHIT DISTRICT

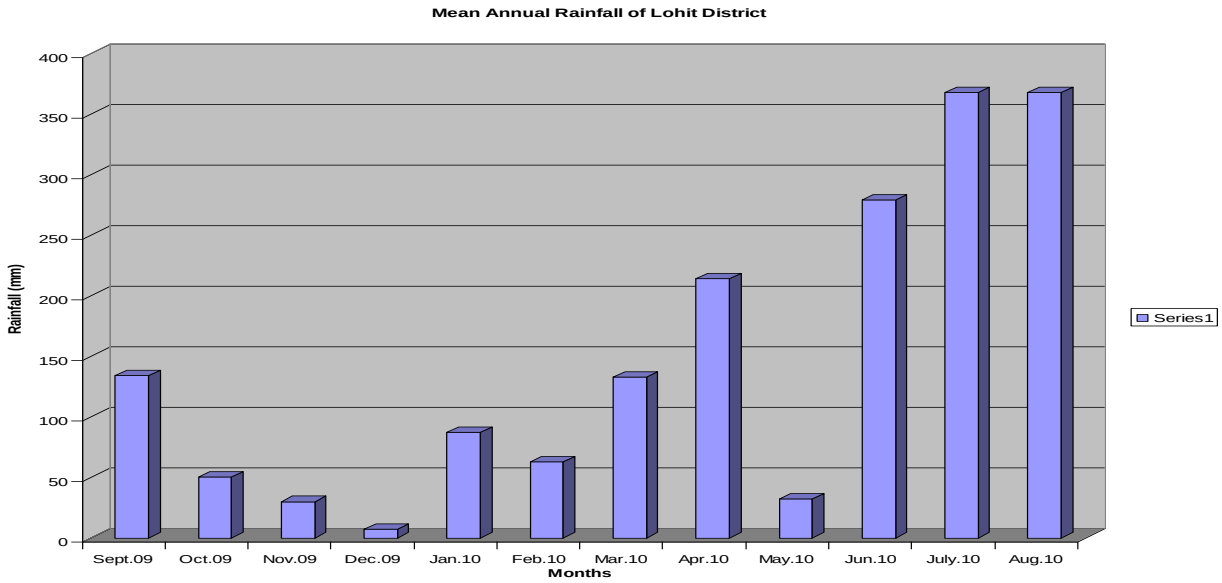


Fig. Average Rainfall map of Lohit-District

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

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 2 weeks (June 3rd week)	Medium rainfall Sandy loam soil, plain lands	Rice	Grow medium duration rice varieties like Satya, Basundhara etc Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc	• Adopt closure row spacing, • Adopt *In-situ* rain water conservation, summer ploughing, interculture, tillage practices • Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigor,	Supply of seeds through Dept.of Agri, ATMA
		Maize	Novjot, Nabin	• Adopt *In-situ* rain water conservation, summer ploughing, interculture, tillage practices	
	Medium rainfall, black soils	Rice	Grow medium duration rice varieties like Satya, Basundhara etc Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc	• Use of bulky organic manures with full P, K and 20% N of recommended dose for basal application. • Maintain more plant population for direct seeded rice. • In-situ rain water conservation, harvesting of runoff for recycling and ground water recharge by elevating the bunds	Breeder seed from AAU Jorhat, Supply of seeds through Dept. of Agril, ATMA etc

Condition	**Suggested Contingency Measures**				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks (July 1st week)	Medium rainfall Sandy loam soil, plain lands	Rice	Grow medium duration rice varieties like Satya, Basundhara etc Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc	• When the mortality of seedlings is less than 50% gap filling should be done. • In-situ rain water conservation, summer ploughing, interculture, tillage practices, weed control. • Apply life saving irrigation to maintain nursery	Supply of seeds through Dept.pf Agri, ATMA
		Maize	Sesame: Gouri, Vinayak, St 1683		
	Medium rainfall, black soils	Rice	Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc Sujata, Durga, PDM-11& 54	• Nursery can be raised for transplanting after application of bulky organic manures with full P,K and 50% N of recommended dose for basal application. • Maintain more plant population in direct seeded rice. • When the mortality of seedlings is less than 50%, gap filling should be done. • *In-situ* rain water conservation by elevating the bund.	Supply of seeds through Dept.pf Agri, ATMA

Condition	Suggested Contingency Measures				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (July 3rd week)	Medium rainfall Sandy loam soil, plain lands	Rice	Varietal substitutions with short duration and drought tolerant varieties of the sole crops i.e. Luit, Kapilee, Satya, basundhara etc. Alternate crops such as Pigeonpea, Greengram, Cowpea should be grown	• Withhold N fertilizer (top dressing) application up to receipt of rainfall. • Crop field should be kept weed free • In rainfed situation apply full dose of P, K and reduce nitrogen application by 40% of the recommended dose as basal along with well decomposed organic manure for early seedling vigor • Close the drainage hole and check seepage loss in direct sown med	Supply of seeds through Dept.pf Agri, ATMA
		Maize	Sesame - fallow Gouri, Vinayak, St 1683	-do-	
	Medium rainfall Black soils	Rice	Varietal substitutions with short duration and drought tolerant varieties of the sole crops i.e. Luit, Kapilee, Satya, basundhara etc.	• Nitrogen application should be reduced by 40 % in basal. Full recommended dose of P and K should be applied. • Close the drainage hole and check seepage loss in direct sown rice. • Timely Weeding	Supply of seeds through Dept.pf Agri, ATMA

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 (August 1st week)	Medium rainfall Sandy loam soil, plain lands	Rice	Grow non paddy crops In the event of late arrival of southwest monsoon the pulses like Cowpea Blackgram, Greengram, Pigeonpea etc	• Use Closure spacing of rice 15 X 15 cm with 4-5 seedlings per hill. • Withhold N fertilizer application till receipt of rainfall. • Apply full P, K and 50 % N at the time of transplanting. • Close the drainage hole and check the seepage loss in direct sown rice regularly.	Supply of seeds through Dept.pf Agri, ATMA
		Maize	Blackgram: USJD 113, KU 301 Sesame: Gouri, Vinayak, St 1683		
	Medium rainfall Black soils	Rice	Grow short duration rice varieties like Luit, Kapilee, Vandana Grow pulses like blackgram, greengram, pigeonpea etc		
		Blackgram	USJD 113, KU 301		

Condition					
Early season drought (normal onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measure**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	Medium rainfall Sandy loam soil, plain lands	Rice Maize Pigeonpea	• Re-sow the crop if the mortality is more than 50%. • Adjust the plant population by gap filling.	• Application of organic matter and FYM. • Apply recommended dose of fertilizers. • Complete hoeing weeding and earthing up at 20 DAS for moisture conservation.	Supply of seed drills and intercultural implements through RKVY. Supply seeds from ATMA, RKVY
	Medium rainfall Black soils	Rice Maize Pigeonpea	• Re-sow the crop if the mortality is more than 50%. • Adjust the plant population by gap filling.	• Strengthen the field and contour bunds for in-situ moisture conservation. • Apply recommended dose of fertilizers. • Application of organic matter and FYM. • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation in groundnut and vegetable crops.	

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 measure**	**Remarks on Implementation**
At vegetative stage	Medium rainfall Sandy loam soil, plain lands	Rice Maize Pigeonpea	Foliar application of nutrients 2% Urea or 2% DAP	• Remove weeds • Strengthen the field bunds & close the holes • Inter-cultivation (Soil mulching). • Organic mulching with previous crop residues. • Follow ridge and furrow method of planting • Follow strip cropping in rolling topography for moisture conservation. • Provide life saving irrigation.	Provide inputs from RKVY
	Medium rainfall Black soils	Rice Maize Pigeonpea	Foliar application of nutrients like 2% Urea or 2% DAP or 1% KNO_3		

condition	Suggested Contingency Measures				
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measure**	**Remarks on Implementation**
At reproductive	Medium rainfall Sandy	Rice Mustard	• Foliar application of 2% urea at pre-flowering and	• Provide irrigation at flowering and grain filling stage.	Provide inputs from RKVY

stage	loam soil, plain lands	Maize, Potato Pigeonpea	flowering stage to pulses and oilseeds • Remove and destroy pest and disease affected plants • Spray 2% KCl + 0.1 ppm boron to non paddy crops to overcome drought	• Harvesting and recycling of rain water • Provide life saving irrigation. • Incase of complete failure of Kharif crop, go for pre-rabi crops/ pulses/vegetable crop cultivation.	
	Medium rainfall Sandy loam soil and Black soils	Rice Mustard, Maize Potato Pigeonpea			

Condition	**Suggested Contingency Measures**				
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Medium rainfall Sandy loam soil, plain lands	Rice Maize Pigeonpea	Harvesting at physiological maturity stage of the crop	Utilization of residual moisture for early sowing of rabi crops like Greengram (Pratap), Blackgram (KU 301), Potato (Kufri Jyoti, Kufri Megha)	Construction of Farm ponds through NREGS, RKVY Supply seeds through ATMA, RKVY
	Medium rainfall Sandy loam soil, Black soil				

2.1.2 Drought- Irrigated situation

Condition	**Suggested Contingency Measures**				
Delayed/ limited release of water in canals due to low rainfall	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
	Canal irrigated Sandy loam soils	Rice-Fallow Rice – Mustard	Rice – Fallow Rice – Niger	Limited & life saving irrigation Provide alternate furrow irrigation, drip irrigation, mulching, Irrigation in root zone	Seeds through ATMA, RKVY

Condition	Suggested Contingency Measures				
Lack of inflows into tanks due to insufficient/ delayed onset of monsoon	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
	NA				

Condition	Suggested Contingency Measures				
Insufficient ground water recharge due to low rainfall	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
	Sandy loam to light black soils (Borewell)	Rice-Vegetable	Short duration varieties of rice like Satya, Basundhara, and short duration varieties of vegetables	Alternate furrow irrigation, Limited & life saving irrigation, sprinkler/ Drip irrigation, Mulching, Irrigate in root zone.	Seeds through ATMA, RKVY

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Paddy	-	Provide drainage If possible	Drain out excess water, harvest at physiological maturity	Shifting to a safer place Dry in shade in a well ventilated space
Greengram, Potato, Mustard	Provide drainage			
Maize				
Sesame				
Horticulture				
Orange	Provide drainage	Provide drainage	Drain out.	Shift to safer place

	Earthing up of plant base/root zone		Harvesting at physiological maturity stage.	
Pineapple	Provide drainage Earthing up of plant base/root zone	Provide drainage	Drain out. Harvesting at physiological maturity stage.	Shift to safer place
Ginger	Provide drainage Earthing up of plant base/root zone	Provide drainage	Drain out. Harvesting at physiological maturity stage and Harvest for vegetable purpose	Shift to safer place
Brinjal	Provide drainage Earthing up of plant base/root zone	Provide drainage	Drain out Harvesting at tender stage for vegetable purpose	Shift to safer place
Chilli	Provide drainage Earthing up of plant base/root zone	Provide drainage	Drain out Harvesting at tender stage for vegetable purpose	Safe storage against storage pest and disease
Heavy rainfall with high speed winds in a short span[2]				
Horticulture				
Orange	Providing wind breaks and drain out.	Providing wind breaks and drain out.	Drain out. Harvesting at physiological maturity stage.	Shift to safer place
Pineapple	Providing wind breaks and drain out.	Providing wind breaks and rain out.	Drain out. Harvesting at physiological maturity stage.	Shift to safer place
Ginger	Providing wind breaks and drain out.	Providing wind breaks and drain out.	Drain out. Harvesting at physiological maturity stage and Harvest for vegetable purpose	Shift to safer place
Brinjal	Providing wind breaks and drain out.	Providing wind breaks and drain out.	Drain out. Harvesting at tender stage for vegetable purpose	Shift to safer place
Chilli	Providing wind breaks and drain out.	Providing wind breaks and drain out.	Drain out. Harvesting at tender stage for	Safe storage against storage pest and disease

			vegetable purpose	
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Spray tricyclazole against blast, Chloropyriphos,Regent against stem borer, Monocrotophos against Swarming caterpillar	Spray tricyclazole against blast, Chloropyriphos against stem borer, Monocrotophos against Swarming caterpillar & leaf folder	Malathion spray against Gundhi bug	Sun drying / disinfection of gunny bags with malathion or heat treatment to manage stored grain pests
Greengram, Potato, Mustard	Apply Phorate granules in the whorls & spray of Endosulfan against maize stem borer	Spray Dimethoate against aphid	Wrapping of cobs against bird damage	Store in clean godown, disinfection of gunny bags / storage structure with malathion
Maize	Removal of infested tips to manage leaf webber	Spraying of systemic insecticide against borers	Spray of Carbufuran dust against capsule borer	Store in clean godown, disinfection of gunny bags / storage structure with malathion
Sesame	Application of Triazophos against YMV	Application of malathion against Flea beetle	Spray of Endosulfan against pod borer	Disinfection of storage structure to manage stored grain pests
Horticulture				
Orange Pineapple	Spraying malathion against beetle, hand collection of egg mass Soil drenching of COC	Application of Triazophos alternatively against fruit borer/ leaf curl virus,	Spraying of Profenophos against fruit borers Metalaxyl against Anthracnose	Segregation of infested fruits & destruction
Ginger Brinjal Chilli	Spraying malathion against beetle, hand collection of egg mass Soil drenching of COC & streptocycline against wilting	Application of Neem oil & Triazophos alternatively against brinjal fruit & shoot borer/ leaf curl virus,	Spraying of Profenophos against fruit borers Metalaxyl against Anthracnose	

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Paddy	Use Submergence tolerant varieties like Jalashree, Jalkanwari, Drainage of the Nursery bed, If not possible go for re –sowing, Dapog method of nursery, SRI method of cultivation	Drainage of excess water. Apply 50% N + 50% K2O as top dressing during the tillering stage. In partially damaged field. gap filling may be done by redistributing the tillers. Wet seeding of sprouted seeds (@75-80 kg/ha) of medium duration varieties like Luit Kapilee Management of pests & diseases	Drainage of excess water. If flood comes during reproductive stage, emphasis should be given on forthcoming rabi crops. Growing of vegetables after receding flood water and adoption of integrated farming system to obtain more income and to compensate the loss during kharif.	Drainage of excess water. If flood comes during reproductive stage, , emphasis should be given on forthcoming rabi crops Supply of seeds and other agro-inputs of *rabi* crops at subsidized rate, provision of bank loan etc. Wet seeding of short duration varieties Utilization of residual soil moisture and use of recharged soil profile for growing pulses
Pulses	Provide drainage, if heavy mortality re-sow the crop	Ensure drainage, Make ridge & furrows	Ensure drainage, Make ridge & furrows	Harvest the matured crop
Horticulture /Plantation crops				
Ginger	Early planting/ seedling	1. Drain out of stagnating water and making field bunds. 2. Re- planting 3.Earthing up of plant base/root zone	Drain out of stagnating water and making field bunds	Shift to safer place.
Brinjal				
Chilli				
Okra				
French bean				
Continuous submergence for more than 2 days	Not Applicable			

Horticulture / Plantation crops				
Ginger	1. Drain out of stagnating water and making field bunds. 2. Re- planting or re-sowing in new areas.	1. Drain out of stagnating water. 2. Re- planting or re-sowing including seed availability. 3. Earthing up of plant base/root zone	2. Drain out of stagnating water. 2. Re- planting or re-sowing including seed availability.	Shift to safer place.
Brinjal				
Chilli				
Okra				
French bean				
Sea water intrusion	Not Applicable			

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

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	Not applicable			
Cold wave	Not applicable			
Frost	Not applicable			
Hailstorm	Resow the crop if heavy damage, Gap filling to maintain optimum population	Stacking where possible, provision for wind break	Stacking where possible, provision for wind break	Harvest at physiological maturity of the crops
Horticulture				
Orange Pineapple	Providing thatch grass roof. Re-planting	Re-planting Direct seeding including seed availability		Shift to safer place
Cyclone	Resow the crop if heavy damage, Gap filling to maintain optimum population	Stacking where possible, provision for wind break.	Stacking where possible, provision for wind break	Harvest at physiological maturity of the crops
Sand deposition or heavy siltation	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	Insurance Encourage the villagers/farmers to cultivate perennial fodder on low laying/irrigated areas on community basis. Establishing fodder and feed banks at village level. Making of silage/hay from extra fodder	Utilizing fodder and feed from perennial trees and Fodder and feed bank of village from silos .	Availing Insurance Culling unproductive livestock
Drinking water	Preservation of water in the tank for drinking purpose Excavation of Bore wells	Using water from reserved tanks for only drinking purpose	Preserve drinking water for future
Health and disease management	Awareness to all the Veterinary sub centers, Dispensary to prepare for the event with medicines and vaccines	Conducting Health Camp at village level	regularly conducting veterinary health camp
Floods			
Feed and fodder availability	1. Storage of Hay, paddy straw in village level at maximum level. 2. Grow tree fodder locally available. For eg. Dimaroo, Malalia, Jackfruit leaves, etc. 3. Establishing fodder and feed banks at village level. 4. Supply of conc. Feed at village level.	1. Used hay, paddy straw from storage. 2. use tree fodders. 3. use agricultural by product as conc. feed. 4. Supply concentrated feed to the villagers.	Do not allow the animals to grazing in flood affected area. Give treatment to the flood affected fodders.
Drinking water	Make aware the villager to preserve drinking water in the tanks at high land	Do not allow the animals to drink flood water. Use water from preserve tanks	Do not allow to drink stagnant flood water. Give treatment to the village pond, well from

		Give treatment to flood water before drinking	Veterinary Dept.
Health and disease management	Make awareness programme for Mass Vaccination at least three months before flood against FMD, Swine Fever. Prepare Veterinary DPPT with Medicines and Stuff	Organized Veterinary Health Camp at village level. Engage extra stuff (Technical person) on flood duties.	Regularly organized Veterinary health camp at least one month after flood.
Cyclone			
Feed and fodder availability	Preserve feed and fodder at village level	Do not allow the animals for free grazing. Use storage feed and fodder.	
Drinking water	Preserve drinking water in tanks	Use preserve water	
Health and disease management	Awareness to the Veterinary sub center/ Dispensary to prepare with medicine	Veterinary health camp	Veterinary health camp
Heat wave and cold wave	NA		
Shelter/environment management			
Health and disease management			
Snowfall	NA		
Earthquake	NA		
Landslides	NA		

[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	Procure feed ingredients from unaffected area and storage for use at village level.	Use feed ingredients from storage		
Drinking water	Preserve drinking water in tanks	Use water from preserve tanks.		
Health and disease management	Prepare Veterinary sub center/ dispensary with medicine and vaccines	Health camp Free treatment	Organized health camp at least one month	
Floods				
Shortage of feed ingredients	Prepare feed storage room at high land or Chang Ghar. Make one common feed storage room at high land where flood cannot affect (in village wise)	Use the feed ingredient after sun drying	Use good condition feed ingredients and discharge damp one	
Drinking water	Preserve drinking water in tanks	Use preserve water from tanks. Treatment to drinking water before use	Treatment to drinking water after at least 30 days	

Health and disease management	Prepare Vaccine and medicine for flood in all Veterinary sub dispensary	Health camp Free treatment	Organized health camp at least one month	
Cyclone	NA			
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management	Prepare shelter shed with all precautionary measure at village level	Shift the birds to shelter shed		
Health and disease management	Prepare medicine and vaccines etc. at village. Veterinary sub center/ dispensary.	Organized health camp		
Snowfall				
Earthquake, Landslides etc				

[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	**NA**		
A. Capture			
Marine			

Inland	NA		
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Secondary water source like river/deep tube well/well/ rain water harvest tank to be developed	Fill up water from the secondary source and apply fertilizer to maintain water productivity.	Stop intake of water from the secondary source
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other	Training and awareness to the Govt. official and farmer		
2) Floods	NA		
A. Capture			
Marine			
Inland	NA		
(i) Loss of stock			
(ii) Changes in water quality			
(iii) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	Try to sell out the stock	Make the stock empty	Again fill the new stock
(ii) Water contamination and changes in water quality	–	Take proper water quality management	Drain out the water partially if possible and fill up from secondary water resource.
(iii) Health and diseases	Maintain the water quality	Use medicine if required	Take suggestion from expert and thenapply medicine

(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)	–	–	Contact the concerned Dept. For any kind of compression and loan
(vi) Any other	Training and awareness to the farmers and FEO, Field staff	–	–
3. Cyclone / Tsunami	NA		
A. Capture	NA		
Marine			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds	Maintain the duke and drainage system properly	Use nets side of pond dykes and drainage canal	Drainage or outlet system should be properly
(ii) Changes in water quality (fresh water / brackish water ratio)	–	Pond water quality should be checked, if required exchange the water	Use lime if required or exchange the water.
(iii) Health and diseases	–	Exchange the water or use medicine	Take the suggestion of expert
(iv) Loss of stock and inputs (feed, chemicals etc)	Try to sell out the stock	Make the stock empty	Again fill up with new stock
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			Contact the concerned dept. For concession of loan
(vi) Any other	Awareness through training, leaflet, radio talk, etc.		
4. Heat wave and cold wave	NA		
A. Capture	NA		

Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)	Management of water quality to be done and arrangement of secondary source of water should be done	Exchange water upto 2/3 and apply fertilizer	Exchange water upto 2/3 and take suggestion from expert.
(ii) Health and Disease management	Provide proper sanitation	Use lime, bleeching, Alum	If required use medicine.
(iii) Any other	Awareness to FEO, Field staff, villagers for the event	–	–

[a] based on forewarning wherever available