

**State: ARUNACHAL PRADESH**  
**Agriculture Contingency Plan for District: LOHIT**

<b>1.0 District Agriculture profile*</b>				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	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	<b>Latitude</b>	<b>Longitude</b>	<b>Altitude</b>
		27 <sup>0</sup> 30' to 28 <sup>0</sup> 45' N	95 <sup>0</sup> 45' to 96 <sup>0</sup> 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

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

<b>1.3</b>	<b>Land use pattern of the district</b> (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
	<b>Area (000ha)</b>	521	41.9	10.3	1.6	NA	2.0	NA	48.9	2.2	1.5

<b>1.4</b>	<b>Major Soils (common names like red sandy loam deep soils (etc.))*</b>	<b>Area ('000 ha)**</b>	<b>Percent (%) of total geographical area</b>
	Black Soils	145.6	12.7
	Alluvial Soils	20.7	1.8
	Sandy Soils	365.88	32.9
	Acid Soils	518.20	45.4

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

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	3.53		
	Gross irrigated area	4.20		
	Rainfed area	32.69		
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	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	-	-	-
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	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)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	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	-	-
	<b>Horticulture crops - Vegetables</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>

	Vegetable	2010	-	-
	Potato	625	-	-
	Ginger	895	-	-
	<b>Medicinal and Aromatic crops</b>	-	-	-
	<b>Plantation crops</b>	-	-	-
	Eg., industrial pulpwood crops etc.	-	-	-
	<b>Fodder crops</b>	-	-	-
	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	-	-
	<b>Others (specify)</b>	-	-	-

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>
	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	1.95
	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)			
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>	
	Commercial	30	20	
	Backyard	-	92.03	

<b>1.10</b>	<b>Fisheries</b> (Data source: Chief Planning Officer)						
	<b>A. Capture</b>						
	<b>i) Marine</b> (Data Source: Fisheries Department)	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		-	-	-	-	-	-
	<b>ii) Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>	
			398				13
	<b>B. Culture</b>						
				<b>Water Spread Area (ha)</b>	<b>Yield (t/ha)</b>	<b>Production ('000 tons)</b>	
	<b>i) Brackish water</b> (Data Source: MPEDA/ Fisheries Department)			-	-	-	
	<b>ii) Fresh water</b> (Data Source: Fisheries Department)			82	1.59	130	
	<b>Others (River/Stream)</b>			-	-	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)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
	Rice	-	-	-	-	-	-	20916.5	19.87	-
	Oilseed (specify)	-	-	-	-	-	-	9459.5	8.28	-
	Maize	-	-	-	-	-	-	10038	12.31	-
	Pulses	-	-	-	-	-	-	2163	12.77	-

	(specify)									
	Ginger	-	-	-	-	-	-	7309	81.90	-
		-	-	-	-	-	-	-	-	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
	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	-

<b>1.12</b>	<b>Sowing window for 5 major field crops (start and end of normal sowing period)</b>	<b>Rice</b>	<b>Maize</b>	<b>Mustard</b>	<b>Potato</b>	<b>Pulses (specify)</b>
	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	-	-	-	-	-

<b>1.13</b>	<b>What is the major contingency the district is prone to? (Tick mark)</b>	<b>Regular*</b>	<b>Occasional</b>	<b>None</b>
	Drought			
	Flood			
	Cyclone			
	Hail storm			
	Heat wave			
	Cold wave			
	Frost			

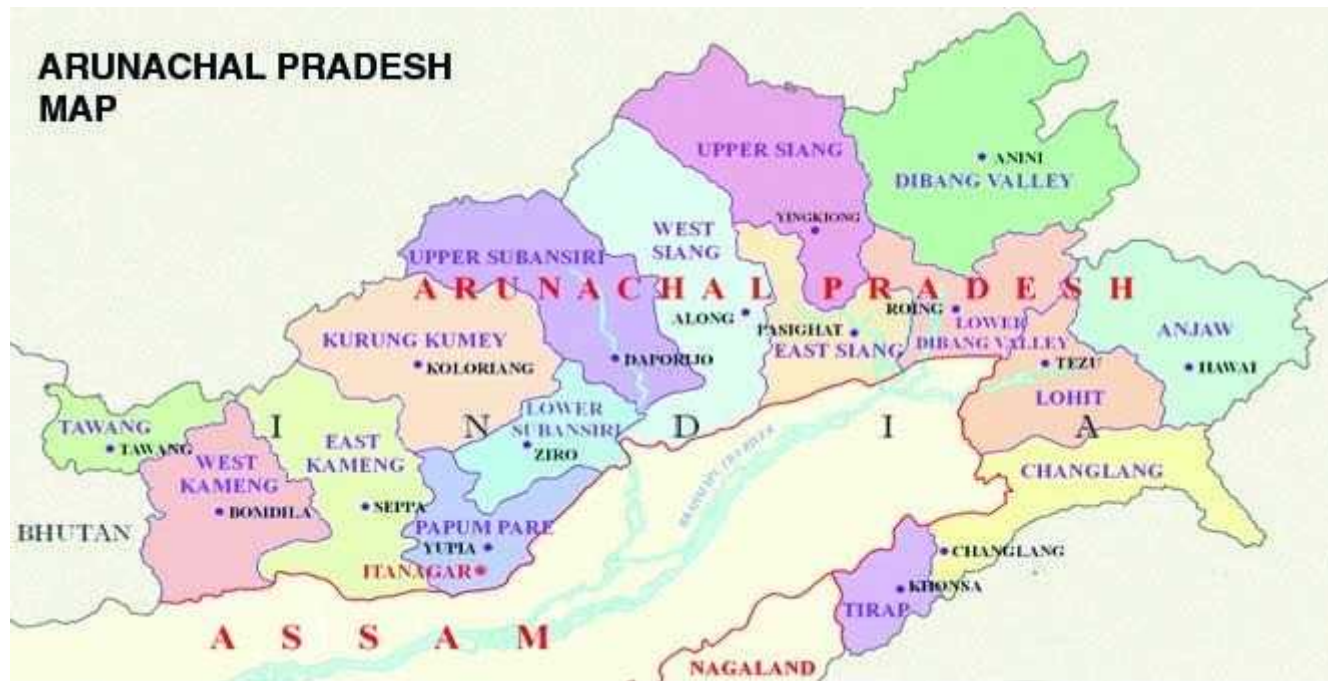
	Sea water intrusion			
	Snowfall			
	Landslides			
	Earthquake			
	Pests and disease outbreak (specify)			
	Others (like fog, cloud bursting etc.)			

\*When contingency occurs in six out of 10 years

<b>1.14</b>	<b>Include Digital maps of the district for</b>	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**

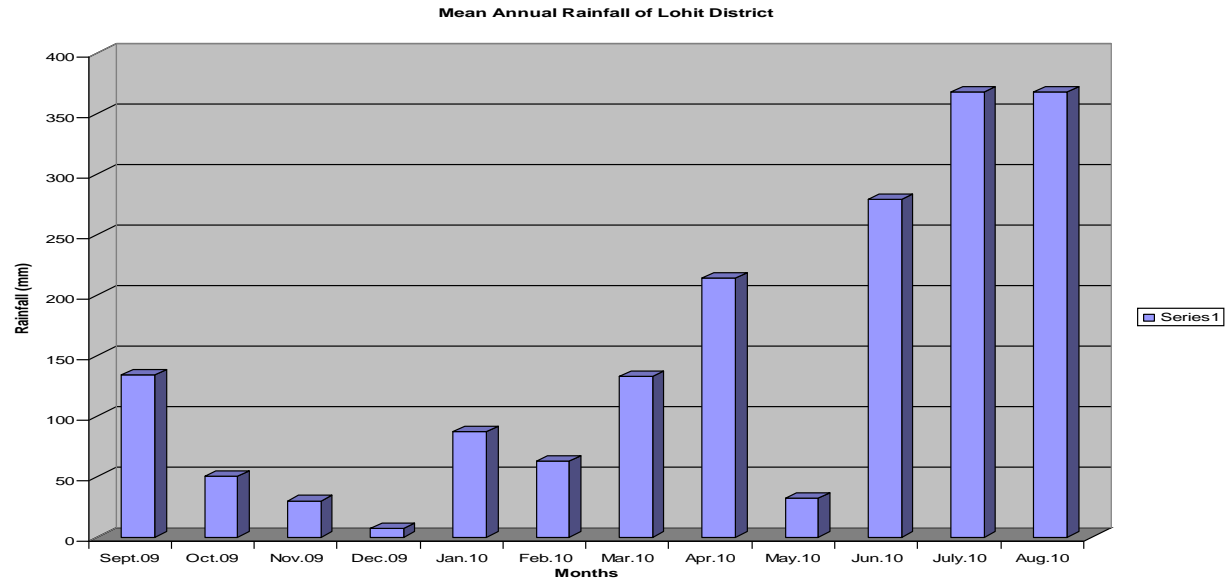


Fig. Average Rainfall map of Lohit-District

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

Condition	Suggested Contingency Measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
<b>Early season drought (delayed onset)</b>  <b>Delay by 2 weeks</b> ( June 3 <sup>rd</sup> 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	<ul style="list-style-type: none"> <li>• Adopt closure row spacing,</li> <li>• Adopt <i>In-situ</i> rain water conservation, summer ploughing, interculture, tillage practices</li> <li>• Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigor,</li> </ul>	Supply of seeds through Dept.of Agri, ATMA
		Maize	Novjot, Nabin	<ul style="list-style-type: none"> <li>• Adopt <i>In-situ</i> rain water conservation, summer ploughing, interculture, tillage practices</li> </ul>	
	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	<ul style="list-style-type: none"> <li>• Use of bulky organic manures with full P, K and 20% N of recommended dose for basal application.</li> <li>• Maintain more plant population for direct seeded rice.</li> <li>• In-situ rain water conservation, harvesting of runoff for recycling and ground water recharge by elevating the bunds</li> </ul>	Breeder seed from AAU Jorhat,  Supply of seeds through Dept. of Agril, ATMA etc

Condition	Suggested Contingency Measures				
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 4 weeks  (July 1 <sup>st</sup> 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	<ul style="list-style-type: none"> <li>• When the mortality of seedlings is less than 50% gap filling should be done.</li> <li>• In-situ rain water conservation, summer ploughing, interculture, tillage practices, weed control.</li> <li>• Apply life saving irrigation to maintain nursery</li> </ul>	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	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Maintain more plant population in direct seeded rice.</li> <li>• When the mortality of seedlings is less than 50%, gap filling should be done.</li> <li>• <i>In-situ</i> rain water conservation by elevating the bund.</li> </ul>	Supply of seeds through Dept.pf Agri, ATMA

Condition	Suggested Contingency Measures				
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 6 weeks  (July 3 <sup>rd</sup> 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	<ul style="list-style-type: none"> <li>• Withhold N fertilizer (top dressing) application up to receipt of rainfall.</li> <li>• Crop field should be kept weed free</li> <li>• 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</li> <li>• Close the drainage hole and check seepage loss in direct sown med</li> </ul>	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.	<ul style="list-style-type: none"> <li>• Nitrogen application should be reduced by 40 % in basal. Full recommended dose of P and K should be applied.</li> <li>• Close the drainage hole and check seepage loss in direct sown rice.</li> <li>• Timely Weeding</li> </ul>	

Condition	Suggested Contingency Measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 8 weeks  (August 1 <sup>st</sup> 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	<ul style="list-style-type: none"> <li>• Use Closure spacing of rice 15 X 15 cm with 4-5 seedlings per hill.</li> <li>• Withhold N fertilizer application till receipt of rainfall.</li> <li>• Apply full P, K and 50 % N at the time of transplanting.</li> <li>• Close the drainage hole and check the seepage loss in direct sown rice regularly.</li> </ul>	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		

<b>Condition</b>					
<b>Early season drought (normal onset)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measure</b>	<b>Remarks on Implementation</b>
<b>Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.</b>	Medium rainfall Sandy loam soil, plain lands	Rice Maize Pigeonpea	<ul style="list-style-type: none"> <li>• Re-sow the crop if the mortality is more than 50%.</li> <li>• Adjust the plant population by gap filling.</li> </ul>	<ul style="list-style-type: none"> <li>• Application of organic matter and FYM.</li> <li>• Apply recommended dose of fertilizers.</li> <li>• Complete hoeing weeding and earthing up at 20 DAS for moisture conservation.</li> </ul>	<p>Supply of seed drills and intercultural implements through RKVY.</p> <p>Supply seeds from ATMA, RKVY</p>
	Medium rainfall Black soils	Rice Maize Pigeonpea	<ul style="list-style-type: none"> <li>• Re-sow the crop if the mortality is more than 50%.</li> <li>• Adjust the plant population by gap filling.</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthen the field and contour bunds for in-situ moisture conservation.</li> <li>• Apply recommended dose of fertilizers.</li> <li>• Application of organic matter and FYM.</li> <li>• Complete hoeing weeding and earthing up at 20 DAS for moisture conservation in groundnut and vegetable crops.</li> </ul>	

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	<ul style="list-style-type: none"> <li>Remove weeds</li> <li>Strengthen the field bunds &amp; close the holes</li> <li>Inter-cultivation (Soil mulching).</li> <li>Organic mulching with previous crop residues.</li> <li>Follow ridge and furrow method of planting</li> <li>Follow strip cropping in rolling topography for moisture conservation.</li> <li>Provide life saving irrigation.</li> </ul>	Provide inputs from RKVY
	Medium rainfall Black soils	Rice  Maize  Pigeonpea	Foliar application of nutrients like 2% Urea or 2% DAP or 1% KNO <sub>3</sub>		

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	<ul style="list-style-type: none"> <li>Foliar application of 2% urea at pre-flowering and</li> </ul>	<ul style="list-style-type: none"> <li>Provide irrigation at flowering and grain filling stage.</li> </ul>	Provide inputs from RKVY

<b>stage</b>	loam soil, plain lands	Maize, Potato Pigeonpea	flowering stage to pulses and oilseeds <ul style="list-style-type: none"> <li>Remove and destroy pest and disease affected plants</li> <li>Spray 2% KCl + 0.1 ppm boron to non paddy crops to overcome drought</li> </ul>	<ul style="list-style-type: none"> <li>Harvesting and recycling of rain water</li> <li>Provide life saving irrigation.</li> <li>Incase of complete failure of Kharif crop, go for pre-rabi crops/ pulses/vegetable crop cultivation.</li> </ul>	
	Medium rainfall Sandy loam soil and Black soils	Rice Mustard, Maize Potato Pigeonpea			

<b>Condition</b>	<b>Suggested Contingency Measures</b>				
<b>Terminal drought</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Rabi Crop planning</b>	<b>Remarks on Implementation</b>
	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

<b>Condition</b>	<b>Suggested Contingency Measures</b>				
<b>Delayed/ limited release of water in canals due to low rainfall</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Agronomic measures</b>	<b>Remarks on Implementation</b>
	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				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient/delayed onset of monsoon	NA				

Condition	Suggested Contingency Measures				
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient ground water recharge due to low rainfall	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			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
<b>Continuous high rainfall in a short span leading to water logging</b>				
Paddy	-	Provide drainage	Drain out excess water, harvest at physiological maturity	Shifting to a safer place
Greengram, Potato, Mustard	Provide drainage	If possible		Dry in shade in a well ventilated space
Maize				
Sesame				
<b>Horticulture</b>				
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
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
<b>Horticulture</b>				
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	
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
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
<b>Horticulture</b>				
Orange	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
Pineapple				
Ginger				
Brinjal	Soil drenching of COC & streptomycin 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	
Chilli				

## 2.3 Floods

Condition	Suggested contingency measure <sup>o</sup>			
Transient water logging/ partial inundation <sup>1</sup>	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% K <sub>2</sub> O 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 <i>rabi</i> 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
<b>Horticulture /Plantation crops</b>				
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				
<b>Continuous submergence for more than 2 days</b>	Not Applicable			

<b>Horticulture / Plantation crops</b>				
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				
<b>Sea water intrusion</b>	Not Applicable			

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

Extreme event type	Suggested contingency measure <sup>r</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Heat Wave</b>	Not applicable			
<b>Cold wave</b>	Not applicable			
<b>Frost</b>	Not applicable			
<b>Hailstorm</b>	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
<b>Horticulture</b>				
Orange Pineapple	Providing thatch grass roof. Re-planting	Re-planting Direct seeding including seed availability		Shift to safer place
<b>Cyclone</b>	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
<b>Sand deposition or heavy siltation</b>	Not Applicable			

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	<p>Insurance</p> <p>Encourage the villagers/farmers to cultivate perennial fodder on low laying/irrigated areas on community basis.</p> <p>Establishing fodder and feed banks at village level.</p> <p>Making of silage/hay from extra fodder</p>	<p>Utilizing fodder and feed from perennial trees and</p> <p>Fodder and feed bank of village from silos .</p>	<p>Availing Insurance</p> <p>Culling unproductive livestock</p>
Drinking water	<p>Preservation of water in the tank for drinking purpose</p> <p>Excavation of Bore wells</p>	<p>Using water from reserved tanks for only drinking purpose</p>	<p>Preserve drinking water for future</p>
Health and disease management	<p>Awareness to all the Veterinary sub centers, Dispensary to prepare for the event with medicines and vaccines</p>	<p>Conducting Health Camp at village level</p>	<p>regularly conducting veterinary health camp</p>
<b>Floods</b>			
Feed and fodder availability	<ol style="list-style-type: none"> <li>1. Storage of Hay, paddy straw in village level at maximum level.</li> <li>2. Grow tree fodder locally available. For eg. Dimaroo, Malalia, Jackfruit leaves, etc.</li> <li>3. Establishing fodder and feed banks at village level.</li> <li>4. Supply of conc. Feed at village level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Used hay, paddy straw from storage.</li> <li>2. use tree fodders.</li> <li>3. use agricultural by product as conc. feed.</li> <li>4. Supply concentrated feed to the villagers.</li> </ol>	<p>Do not allow the animals to grazing in flood affected area.</p> <p>Give treatment to the flood affected fodders.</p>
Drinking water	<p>Make aware the villager to preserve drinking water in the tanks at high land</p>	<p>Do not allow the animals to drink flood water.</p> <p>Use water from preserve tanks</p>	<p>Do not allow to drink stagnant flood water.</p> <p>Give treatment to the village pond, well from</p>

		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 staff (Technical person) on flood duties.	Regularly organized Veterinary health camp at least one month after flood.
<b>Cyclone</b>			
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
<b>Heat wave and cold wave</b>	NA		
Shelter/environment management			
Health and disease management			
<b>Snowfall</b>	NA		
<b>Earthquake</b>	NA		
<b>Landslides</b>	NA		

<sup>s</sup> based on forewarning wherever available

## 2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event <sup>a</sup>	During the event	After the event	
<b>Drought</b>				
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	
<b>Floods</b>				
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	
<b>Cyclone</b>	NA			
Shortage of feed ingredients				
Drinking water				
Health and disease management				
<b>Heat wave and cold wave</b>				
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				

<sup>a</sup> based on forewarning wherever available

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
<b>1) Drought</b>	NA		
<b>A. Capture</b>			
Marine			

Inland	NA		
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
<b>B. Aquaculture</b>			
(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		
<b>2) Floods</b>	NA		
<b>A. Capture</b>			
Marine			
Inland	NA		
(i) Loss of stock			
(ii) Changes in water quality			
(iii) Health and diseases			
<b>B. Aquaculture</b>			
(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 then apply 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	–	–
<b>3. Cyclone / Tsunami</b>	NA		
A. Capture	NA		
Marine			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds	Maintain the dike 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.		
<b>4. Heat wave and cold wave</b>	NA		
A. Capture	NA		

Marine			
Inland			
<b>B. Aquaculture</b>			
(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, bleaching, Alum	If required use medicine.
(iii) Any other	Awareness to FEO, Field staff, villagers for the event	-	-

<sup>a</sup> based on forewarning wherever available