Agriculture Contingency Plan

District: Namsai

State: ARUNACHAL PRADESH

KRISHI VIGYAN KENDRA
District: Namsai
(Indian Council of Agricultural Research)
AP Centre Basar, Arunachal Pradesh

Ref. No: 14(2)/KVK/Namsai/2018-19/84 Dtd: 24.05.18

State: ARUNACHAL PRADESH

Agriculture Contingency Plan for District: Namsai

1.0 District Agriculture profile*				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)			
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region		
	Agro Climatic Zone (NARP)	Temperate/Sub-alpine Zone		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	**Whole District**		
	Geographic coordinates of district headquarters	**Latitude**	**Longitude**	**Altitude**
		27^0 30' to 27^0 55' N	$95^0$45' to $96^0$20' E	156 MSL
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ICAR RC NEH Region AP Centre, Basar, Arunachal Pradesh		
	Mention the KVK located in the district with full address	KVK, Momong, Namsai-District under ICAR RC NEH Region AP Centre, Basar, Arunachal Pradesh		
	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.		

***Indicate source of data while furnishing information at different places in the district profile.**

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):	452	NA	1st week of June	2nd week of October
	NE Monsoon(Oct-Dec):	69	NA	3rd week of October	2nd week of November
	Winter (Jan- February)	50	NA	-	-
	Summer (March-May)	210	NA	-	-
	Annual;	228	NA	-	-

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	1587 Sq. km	191.31 sq km		62.5 sq km	12.3 sq km	49.02 sq km	21.32 sq km	627.92 sq km	76.5 sq km	65.79 sq km

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)*	Area ('000 ha)**	Percent (%) of total geographical area
	1. Black Soil	-	-
	2. Alluvial Soil	NA	NA
	3. Sandy Soil	NA	NA
	4. Acid Soil	NA	NA
	5. Red Soil	NA	NA

	Others (specify):		

* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP); ** Pl. give the details of the major soils occupying more than 5% of total geographical area. Degree of soil acidity (pH) may also be indicated

1.5	**Agricultural land use**	Area (sq. km.)	Cropping intensity %
	Net sown area	478.74	131%
	Area sown more than once	NA	
	Gross cropped area	627.92	

1.6	**Irrigation**	Area (‘000 ha) (undivided district)		
	Net irrigated area	3.53		
	Gross irrigated area	4.36		
	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	10		
	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	05	100	no
	Wastewater availability and use		< 70	
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

District Statistical Hand book, Namsai District - 2016-17, Arunachal Pradesh-792001

1.6. a.	**Fertilizer and Pesticides use**	Type	Total quantity (tonnes)
1	Fertilizers*	Urea	-
		DAP	--
		Potash	--
		SSP	--
		Other straight fertilizers (specify)NPK	-
		Other complex fertilizers (specify)	-
2	Chemical Pesticides*	Insecticides	NA
		Fungicides	NA
		Weedicides	NA
		Others (specify)	-

* If break up is not available, indicate total quantity used in the district for any recent year, mention here the year and source of statistic

District Statistical Hand book, Namsai District - 2016-17, Arunachal Pradesh-792001

1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 2016-17)

1.7	S.No.	Major field crops cultivated	Area ('000 ha)							
			Kharif			*Rabi*				
			Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	1	Paddy	NA	NA	NA	NA	NA	NA	NA	9.375
	2	Maize	NA	NA	NA	NA	NA	NA	NA	1.475
	3	Oil Seed	NA	NA	NA	NA	NA	NA	NA	1.438
	4	Pulses	NA	NA	NA	NA	NA	NA	NA	0.512
		Others (specify)								

	S.No.	**Horticulture crops - Fruits**	**Area ('000 ha)**		
			Total	**Irrigated**	**Rainfed**
	1	Orange	0.96	NA	NA
	2	Pineapple	0.13	NA	NA
	3	Banana	0.3	NA	NA
	4	Litchi	0.005	NA	NA
	5	**Arecanut**	**0.030**		
	Others (specify)				

		Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	1	Vegetable	5.345	NA	NA
	2	Potato	0.405	NA	NA
	3	Ginger	1.42	NA	NA
	4	**Turmeric**	**1.42**	NA	NA
	5	**Black Pepper**	**0.030**	NA	NA
	Others (specify)				
		Medicinal and Aromatic crops	**Total**	**Irrigated**	**Rainfed**
	1	NA	NA	NA	NA
	2	NA	NA	NA	NA
	Others (specify)				
		Plantation crops	**Total**	**Irrigated**	**Rainfed**
	1	NA	NA	NA	NA
	2	NA	NA	NA	NA
	3	NA	NA	NA	NA
	4	NA	NA	NA	NA
	5	NA	NA	NA	NA
	Others (Specify)	Eg., industrial pulpwood crops etc.			

		Fodder crops	Total	Irrigated	Rainfed
	1	NA	NA	NA	NA
	2	NA	NA	NA	NA
	3	NA	NA	NA	NA
	4	NA	NA	NA	NA
	5	NA	NA	NA	NA
	Others (Specify)				
		Total fodder crop area			
		Grazing land, reserve areas etc	1.230		
		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	18.671	16.482	42.967
	Improved / Crossbred cattle			
	Buffaloes (local low yielding)	0.322	1.337	1.988
	Improved Buffaloes	-	-	-
	Goat	-	-	11.696

	Sheep	-	-	
	Pig	-	-	11.696
	Mithun	-	--	
	Yak			--
	Others (Horse, mule, donkey etc., specify)			
	Commercial dairy farms (Number)			1 no
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	-		
	Backyard	-	137.590	

1.10 **Fisheries** (Data source: District Statistical Hand book, Namsai District, 2016-17)

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**
	1231		

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)	148	-	0.9
Others (River/Stream)			0.001

1.11 Production and Productivity of major crops (2016-17)

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)										
Crop 1	Rice	-		-		-		23.44	2500	NA
Crop 2	Oilseed	-		-		-		0.845	588	NA
Crop 3	Maize	-		-		-		0.1655	1122	NA
Crop 4	Pulses	-		-		-		0.0683	1334	NA
Crop 5	Ginger	-		-		-		1.136	8000	NA
Others										
Major Horticultural crops (Crops to be identified based on total acreage)										
Crop 1	Orange	-		-		-		4.2	4400	NA
Crop 2	Pineapple	-		-		-		1.1	8460	NA
Crop 3	Banana	-		-		-		1.255	4160	NA
Crop 4	Litchi	-		-		-		0.288	2880	NA
Crop 5	Papaya	-		-		-		0.0125	4160	NA
Others	Mango							-	-	-

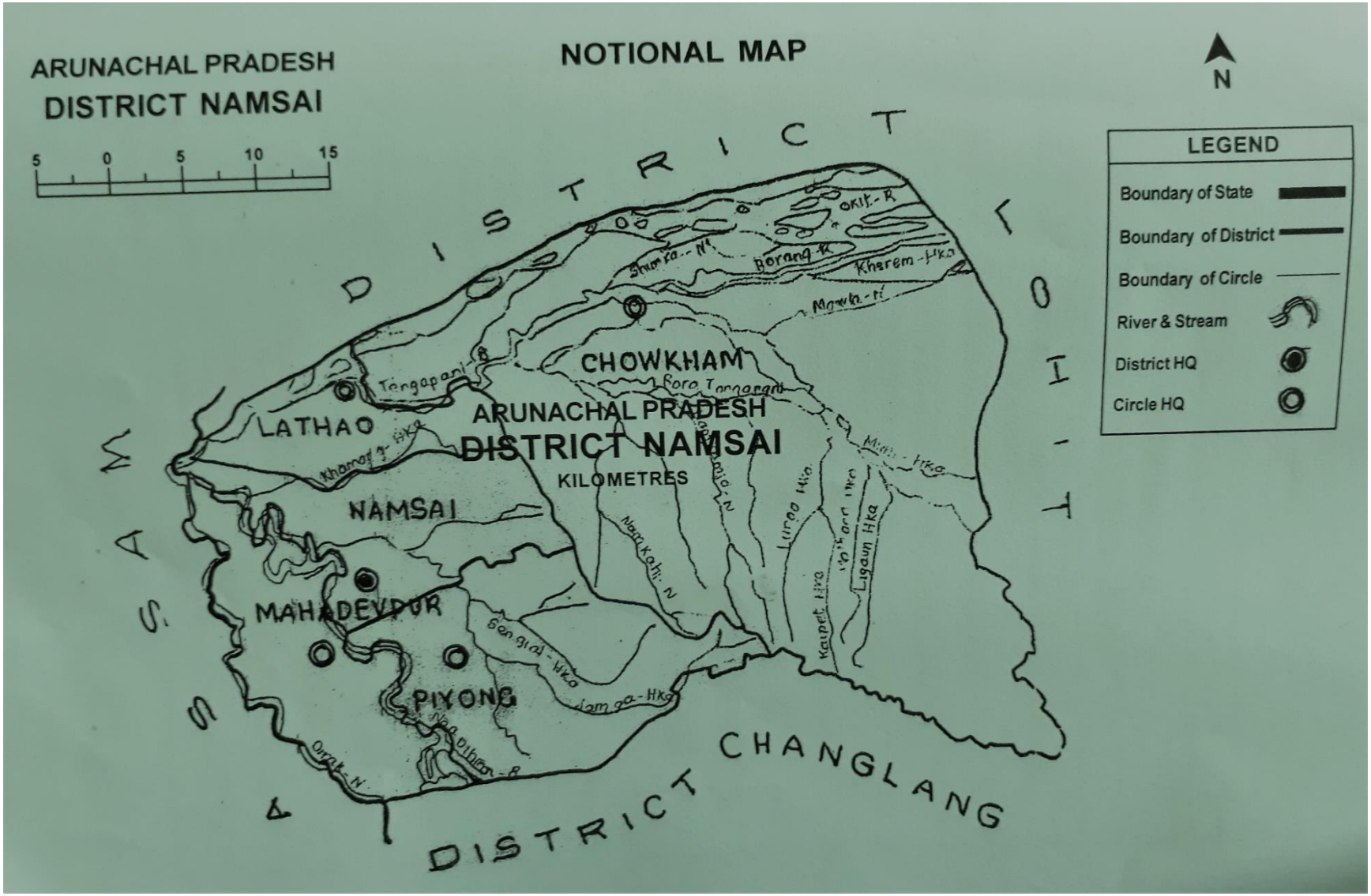
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Crop 1: Rice	2: Maize	3: Mustard	4: Potato	5: Pulses
	Kharif- Rainfed	June-Aug	Feb-Apr	-	-	Aug-Sept
	Kharif-Irrigated	June-Aug	NA	-	-	-
	Rabi- Rainfed	Feb-Mar	Sept-Oct	Oct-Nov	Oct-Dec	Oct-Nov
	Rabi-Irrigated	Feb-Mar	NA	-	-	-
	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**	1. Namsai District Map (Annexure - I)	Enclosed: Yes
		2. Namsai Road Map (Annexure - II)	Enclosed: Yes
		3. Namsai District Annual Rainfall (Annexure - IV) , 2017	Enclosed: Yes

Annexure: 1 **Location Map of Namsai District**



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rain fed 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 Ranjan, Basundhara etc Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc	• Closer row and plant spacing, • In-situ rain water conservation, summer ploughing, interculture, tillage practices, weed • Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigor, • Maintain plant population per unit area of the crop	Supply of seeds through Dept.of Agri, ATMA
	Medium rainfall, black soils	Rice	Grow medium duration rice varieties like Satya Ranjan, 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 Ranjan, Basundhara etc Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc	• Apply life saving irrigation to maintain nursery • 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.	Supply of seeds through Dept.pf Agri, ATMA
		Sesamum	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 Use of bulky organic manures with full P,K and 50% N of recommended dose for basal application. • Maintain more plant population for 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 Ranjan, Basundhara etc. Non paddy crop such as , arhar, green gram, cow pea, Soyabean, Black Gram should be grown	• In rainfed situation apply full P, K and reduce Nitrogen application by 40% of the recommended dose as basal along with well decomposed organic manure for early seedling vigour • Close the drainage hole and check seepage loss in direct sown medium land rice regularly. • Withhold N fertilizer (top dressing) application up to receipt of rainfall. • crop field should be kept weed free	Supply of seeds through Dept.pf Agri, ATMA
		Sesamum - fallow	Gouri, Vinayak, St 1683	-do-	-do-
	Medium rainfall Sandy loam soil, 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**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**

		system			
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, Arhar etc	• Use Closer spacing of Rice 15 X 15 cm • Close the drainage hole and check the seepage loss in direct sown rice regularly. • Withhold N fertilizer application till receipt of rainfall. • Follow plant protection measures against stem borer and blast in nursery. • Use tractor, power tiller, rotavator for speedy land preparation. • Follow close planting of 4-5 seedlings per hill. • Apply full P, K and 50 % N at the time of transplanting.	Supply of seeds through Dept.pf Agri, ATMA
		Maize	Novjot, Nabin		
		Black Gram Green Gram	USJD 113, KU 301, SBC 40,47/ PU-31 IPM 02-3/SGC 16/SGC 20		
	Medium rainfall Sandy loam soil, Black soils	Rice	Grow short duration rice varieties like Luit, Kapilee, Vandana Grow pulses like blackgram, greengram, Arhar etc	• Close the drainage hole and check the seepage loss in direct sown medium land rice regularly. • Withhold N fertilizer application till receipt of rainfall. • Follow plant protection	Supply of seeds through Dept.pf Agri, ATMA

		Black gram Green Gram	USJD 113, KU 301, SBC 40,47/ PU-31 IPM 02-3/SGC 16/SGC 20	measures against stem borer and blast in nursery. • Use tractor, power tiller, rotavator for • speedy land preparation. • Apply life saving irrigation. • Use Closer spacing of Rice 15 X 15 cm	

***Matrix for specifying condition of early season drought due to delayed onset of monsoon (2, 4, 6 & 8 weeks) compared to normal onset (2.1.1)**

Normal onset (Month and week)	**Month and week for specifying condition of early season drought due to delayed onset of monsoon**			
	Delay in onset of monsoon by			
	2 wks	**4 wks**	**6 wks**	**8 wks**
June 1st wk *	June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk
June 2nd wk	June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk
June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk
June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk
July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk	Sep 1st wk
July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk	Sep 2nd wk

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 Mustard Maize Potato Arhar	• Resow the crop if the mortality is more than 50%. • Adjust the plant population by gap filling .	• Organic matter, FYM application. • Apply recommended dose of fertilizers. • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation.	Supply of seed drills and intercultural implements through RKVY. Supply seeds from ATMA, RKVY
	Medium rainfall Sandy loam soil, Black soils	Rice Mustard Maize Potato Arhar	• Resow 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. • Organic matter, FYM application • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation in groundnut and vegetable crops.	Supply of seed drills and intercultural implements through RKVY. Supply seeds from ATMA, RKVY

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 Mustard Maize Potato Arhar	Foliar application of nutrients 2% Urea or 2% DAP Irrigation through WHS	• Remove weeds • Strengthen the field bunds & close the holes • Provide life saving irrigation. • 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 inputs from RKVY
	Medium rainfall Sandy loam soil, Black soils	Rice Mustard Maize Potato Arhar	Foliar application of nutrients 2% Urea or 2% DAP or 1% KNO_3 Irrigation through WHS	• Remove weeds • Strengthen the field bunds & close the holes • Provide life saving irrigation. • 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	**- do -**

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 stage	Medium rainfall Sandy loam soil, plain lands	Rice Mustard Maize, Potato Arhar	• Foliar application of 2% urea at pre-flowering and 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	• Provide irrigation at flowering and grain filling stage. • 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.	Provide inputs from RKVY
	Medium rainfall Sandy loam soil, Black soils	Rice Mustard Maize Potato Arhar	• Foliar application of 2% urea at pre-flowering and 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	• Provide irrigation at flowering and grain filling stage. • 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.	Provide inputs from RKVY

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 Mustard Maize Potato Arhar	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 soils	Rice Mustard Maize Potato Arhar	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

Notes:

a. Describe the major farming situation to provide information on growing environment (rainfall and soil information - colour, depth & texture) such as low rainfall shallow red sandy loam soils, high rainfall deep black soils, uplands, medium lands, eroded hill slops etc. tank fed black soils, shallow acid soils, sodic vertisols etc

b. Describe the normal crop or cropping system grown in that farming situation including catch crop, sequence, rotation & variety if known

c. Describe the alternative crop, variety and/or cropping pattern in view of the delay in monsoon and shortening of the growing period including delay in sowing of nurseries in case of paddy.

- In case of normal onset followed by early season droughts re-sowing may be recommended including variety seed rate etc.
- In case of early or mid season dry spells indicate crop management techniques to save standing crop.
- In case of terminal drought indicate giving life saving supplemental irrigation, if available or taking up harvest at physiological maturity with some realizable grain/fodder yield etc.

d. Describe all agronomic practices which help in coping with late planting like increased or decreased spacing, changes in planting geometry, intercropping in case of sole crops, thinning, mulching, spray of anti-transpirants or other chemicals, supplemental irrigation, soil and moisture conservation practices like ridging, conservation furrows, dust mulch etc.

- In case of early and mid season dry spells indicate moisture conservation techniques to save standing crop.
- In case of terminal drought indicate early rabi cropping with suitable crops/varieties with a possibility of giving pre-sowing/come up irrigation etc.

e. Give details on the source of the breeder seed, in case an alternate crop or variety is suggested as part of the contingency. For agronomic measures, indicate any convergence possible with ongoing central or state schemes like National Rural Employment Guarantee Scheme (NREGS), Integrated Watershed Management Programme (IWMP), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on

Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM), Community Land Development Programme (CLDP) etc., to meet the cost of materials, labour or implements etc. to carry out any field based activity quickly.

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, 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**
	Borewell Irrigated soil	Rice-Vegetable	Short duration varieties of rice like Satya Ranjan, Basundhara, and short duration varieties of vegetables	Alternate furrow irrigation, Limited & life saving irrigation, sprinkler/ Drip irrigation, use Mulching, Irrigation in root zone.	Seeds through ATMA, RKVY

Notes:

[f] Describe such as uplands, medium and low lands and source of irrigation such as tank fed medium or deep black/loamy/red soils, tube well irrigated red soils, canal irrigated red soils, well irrigated black soils etc.,

[g] The normal crop or cropping systems grown in a given irrigated situation

[h] Suggested change in the crop, variety or cropping system in view of delay in release of irrigation water, less water availability etc.,

[I] All agronomic measures like improved methods of irrigation (skip row etc.), micro irrigation (drip/sprinkler/sub-surface), deficit irrigation, limited area irrigation, mulching etc, that improve water use efficiency and make best use of limited water including methods of ground water recharge and sharing.

[j] Comments on source of availability of seed of the alternate crop or variety, any constraints in marketing of alternative crop implications for livestock and dairy sectors and details of state or central schemes like National Rural Employment Guarantee Scheme (NREGS), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM) etc., which facilitate implementation of the agronomic measures suggested.

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[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Crop1. Paddy	Not a substantial problem	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
Crop2.Greengram, Potato, Mustard	Provide drainage	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
Crop3. Maize	Provide drainage	Provide drainage	Drain out excess water, harvest at physiological maturity	Shifting to a safer place Dry in shade in a well ventilated space
Crop4. Sesamum	Provide drainage	Provide drainage	Drain out excess water, harvest at physiological maturity	Shifting to a safer place Dry in shade in a well ventilated space
Horticulture				
Crop1. Orange	Provide drainage Earthing up of plant	Provide drainage	Drain out. Harvesting at physiological maturity	Shift to safer place

	base/root zone		stage.	
Crop2. Pineapple	Provide drainage Earthing up of plant base/root zone	Provide drainage	Drain out. Harvesting at physiological maturity stage.	Shift to safer place
Crop3. 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
Crop4. 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
Crop5. 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]	NA			
Horticulture				
Crop1. Orange	Providing wind breaks and drain out.	Providing wind breaks and drain out.	Drain out. Harvesting at physiological maturity stage.	Shift to safer place
Crop2. Pineapple	Providing wind breaks and drain out.	Providing wind breaks and rain out.	Drain out. Harvesting at physiological maturity stage.	Shift to safer place
Crop3. 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
Crop4. 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
Crop5. Chilli	Providing wind breaks and drain out.	Providing wind breaks and drain out.	Drain out. Harvesting at tender stage for vegetable purpose	Safe storage against storage pest and disease
Outbreak of pests and diseases due to unseasonal rains				
Crop1. Paddy	Spray tricyclazole against blast,	Spray tricyclazole against blast,	Malathion 5% dust or installation of traps against Gundhi bug	Sun drying / disinfection of gunny bags with

	Chloropyriphos,Regent against stem borer, Profex/Anumite against Swarming caterpillar	Chloropyriphos against stem borer, Monocrotophos against Swarming caterpillar & leaf folder		malathion or heat treatment to manage stored grain pests
Crop2.Greengram, Potato, Mustard	Apply systemic insectisides against insect pests of Green Gram, Potato and Mustard	Spray Dimethoate against aphid	Wrapping of cobs against bird damage	Store in clean godown, disinfection of gunny bags / storage structure with malathion
Crop3. 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
Crop4. Sesamum	Application of Triazophos against YMV	Application of malathion against Flea beetle	Spray of Profex against pod borer	Disinfection of storage structure to manage stored grain pests
Horticulture	Application of petrolium based agriculture oil fort soft bodied insects and COC for disease managament Regular monitoring of trunk borer, holes can be plastered by cowdung-mud			
Crop1. Orange Crop2. 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
Crop3. Ginger Crop4. Brinjal Crop5. 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	

k.Such as drainage in black soils, indicate taking up need based inter-culture operations, outbreak of pests/diseases along with their management etc.

[l] Such as drainage in black soils, application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruiting and indicate possibility of pest/disease outbreak with need based prophylactic / curative management etc.

[m] Such as drainage in black soils, measures for preventing seed germination etc and Indicate possibility of harvesting at physiological maturity immediately and shifting produce to safer place and protection against pest/disease damage in storage etc.

[n] Such as shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop1. 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
Crop2. Pulses	Provide drainage, if heavy mortality resow the crop	Ensure drainage, Make ridge & furrows	Ensure drainage, Make ridge & furrows	Harvest the matured crop
Horticulture /Plantation crops				
Crop1 Ginger	Early planting	1. Drain out of stagnating	Drain out of stagnating	Shift to safer place.

Crop2. Brinjal	Early seedling	water and making field bunds. 2. Re- planting 3.Earthing up of plant base/root zone	water and making field bunds	
Crop3. Chilli	Early seedling			
Crop4. Okra	Early seedling			
Crop5. French bean	Early planting			
Continuous submergence for more than 2 days[2]	NA			
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture / Plantation crops				
Crop1 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.
Crop2. Brinjal				
Crop3. Chilli				
Crop4. Okra				
Crop5. French bean				
Sea water intrusion[3]	NA			

Notes:

Flood situation could arise during early season (eg. summer season) or in the main season; Accordingly contingency measures could be suggested

[1] Water logging due to heavy rainfall, poor drainage in vertisols, flash floods in streams and rivers due to high rainfall, breach of embankments

[2] If the water remains in the field due to continuous rains, poor infiltration and push back effect

[3] Entry of sea water into cultivated fields in coastal districts due to tidal wave during cyclones or tsunami; intrusion of seawater into groundwater in coastal districts

[o] Crop/field management depends on nature of material (sand or silt) deposited during floods. In sand deposited crop fields/ fallows indicate ameliorative measures such as early removal of sand for facilitating *rabi* crop or next kharif. In silt deposited indo-gangetic plains, indicate early *rabi* crop plan in current cropped areas and current fallow lands. Indicate drainage of stagnating water and strengthening of field bunds etc. In diara land areas indicate crop plans for receding situations. Usually rice cropped areas are flood prone causing loss of nurseries, delayed

transplanting or damage to the already transplanted fields etc. Indicate community nursery raising, scheduling bushenings, re-transplanting in damaged fields and transplanting new areas or direct seeding including seed availability so that the season is not lost. Indicate steps for preventing pre-mature germination of submerged crop at maturity or harvested produce.

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[p]	NA			
Cold wave[q]	NA			
Frost	NA			
Hailstorm Crop1 (specify)	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				
Crop1 Orange Crop2. Pineapple	Providing thatch grass roof/ agroshed net	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	NA			
Specify crop/horticulture/plantation	NA			

Notes:

[p] In regions where the normal maximum temperature is more than 40^0C, if the day temperature exceeds 3^0Cabove normal for 5 days it is defined as heat wave. Similarly, in regions where the normal temperature is less than 40^0C, if the day temperature remains 5^0C above normal for 5 days, it is defined as heat wave.

[q] In regions where normal minimum temperature remains 10^0C or above, if the minimum temperature remains 5^0C lower than normal continuously for 3 days or more it is considered as cold wave. Similarly in regions with normal minimum temperature is less than 10^0C, if the minimum temperature remains 3^0C lower than normal it is considered as cold wave

[r] Indicate appropriate crop/soil management measures depending upon the crop and its stage for alleviating the specified stress.

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 specially maize as a major concentrated feed ingredient. 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 . Feed locally prepared concentrated feed	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 Awareness cum 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	1. Used hay, paddy straw from storage and	Do not allow the animals

	and demonstration of its treatment for enrich nutritive value. 2. Grow tree fodder locally available. For eg. Dimaroo, Mango tree leaves, Jackfruit leaves, bamboo etc. 3. Establishing fodder and feed banks at village level. 4. Supply of conc. Feed at village level. 5. Cultivate maize fodder and store the seeds.	fed treated one. 2. Use tree fodders. 3. use agricultural by product as conc. feed. 4. Supply concentrated feed to the villagers. 5. Fed concentrated feed with locally available ingredients.	to grazing in flood affected and submerge areas. 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 Give treatment to flood water before drinking	Do not allow to drink stagnant flood water. Give treatment to the village pond to ensure clean water facilitated by state vety. Dept..
Health and disease management	Make awareness programme for Proper deworming and Mass Vaccination at least three months before flood against FMD, Swine Fever. Prepare Veterinary DPPT with Medicines and Stuff	Organized Awareness cum Animal Health Camp at village level. Engage extra stuff (Technical person) on flood duties. Segregate the infected animals	Regularly organized Awareness cum Animal Health Camp at least one month after flood. Segregate the infected animals and properly buried the death animals.
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	Cultivate and store major feed ingredient like Maize every year. Procure feed ingredients from unaffected area and storage for use at village level.	Use feed ingredients from storage	Use sun dried feed ingredients from store.	Supply concentrated feeds under TSP.
Drinking water	Preserve drinking water in tanks	Use water from preserve tanks.	Provide clean water.	
Health and disease management	Prepare Veterinary sub center/ dispensary with medicine and vaccines	Health camp Free treatment	Organized health camp at least one month	Supplementation of electrolytes, min and vitamins mixture
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	Supply concentrated feeds under TSP.
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	Ensure availability of Vaccines and medicines for flood in all Veterinary sub dispensary	Awareness cum Health camp Free treatment	Organized awareness cum 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 maintain cool-temperature during Hot days. Provide sufficient eight & heat maintain treatment temperature during cold wave		
Health and disease management	Prepare medicine and vaccines etc. at village. Veterinary sub center/ dispensary.	Organized health camp Maintenance of ideal temperature during hot days. Management of sufficient light & Heat to maintain normal temperature during cold wave	Supplementation of anti-stress agent and electrolytes	
Snowfall	NA	NA	NA	NA
Earthquake, Landslides etc	NA	NA	NA	NA

[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/ Other water sources like bore well may be utilized depending upon the situation	Fill up water from the secondary source and apply fertilizer to maintain water productivity./ Big Fishes are to be harvest and sold and the smaller ones can be kept in small ponds	Stop intake of water from the secondary source/ The small sized fishes should be brought to main culture pond
(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	Liming should be done in the aquaculture area	Fish seed , feed, lime can be distributed
2) Floods			
A. Capture	NA		
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 then apply medicine
(iv) Loss of stock and inputs (feed, chemicals etc)			Inputs may be provided
(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

ANNEXUTE : Rainfall

Sl. No.	Month	Rainfall (2016) (MM)	Temperature (Centigrade)		Relative Humidity (In percentage)
			Maximum	Minimum	
01	January	30.00	16.60	12.20	81%
02	February	16.50	19.60	13.60	97%
03	March	64.50	25.80	13.70	99%
04	April	602.00	26.90	18.20	99%
05	May	243.00	30.10	21.40	90%
06	June	509.00	32.10	24.00	92%
07	July	548.00	32.50	25.00	91%
08	August	184.00	32.20	26.00	84%
09	September	557.00	33.00	18.00	79%
10	October	257.00	27.00	20.00	91%
11	November	DNA	23.70	19.10	89%
12	December	DNA	18.20	14.20	82%

Annexure – I


NAMSAI
DISTRICT
Brahmaputra River
LOHIT
ASSAM
N
LEGEND
National Highway
Major Road
District Boundary
State Boundary
River
District HQ
Major Town
Other Town
Bhogamur
Lathao
Kasik
NH-52
Kaisu
NAMSAI
Mahadevpur
Wingko
Piyong
New Mohong
Map not to Scale
Copyright © 2014 www.mapsofindia.com
(Updated on 26th November 2014)
CHANGLANG

Annexure - II


NAMSAI
ROAD MAP
N
ASSAM
Lathan
LOHIT
NINGRU
Mahadevpur
Pyong
CHANGLANG
LEGEND
National Highway
Major Road
District Boundary
State Boundary
District HQ
Major Town
Map not to Scale
Copyright © 2014 www.mapsofindia.com
(Updated on 20th August 2014)

Annexure - III

Namsai District Annual Rainfall (2017)

Sl. No.	Month	Rainfall (2016) (MM)	Temperature (Centigrade)		Relative Humidity (In percentage)
			Maximum	Minimum	
01	January	40	16.60	12.20	81%
02	February	60	19.60	13.60	97%
03	March	120	25.80	13.70	99%
04	April	222	26.90	18.20	99%
05	May	290	30.10	21.40	90%
06	June	479	32.10	24.00	92%
07	July	550	32.50	25.00	91%
08	August	459	32.20	26.00	84%
09	September	320	33.00	18.00	79%
10	October	159	27.00	20.00	91%
11	November	28	23.70	19.10	89%
12	December	20	18.20	14.20	82%